VIEW INTEGRATION
USING
THE ENTITY-RELATIONSHIP MODEL

VOL 2

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Doctor of Philosophy

THE UNIVERSITY OF ASTON IN BIRMINGHAM

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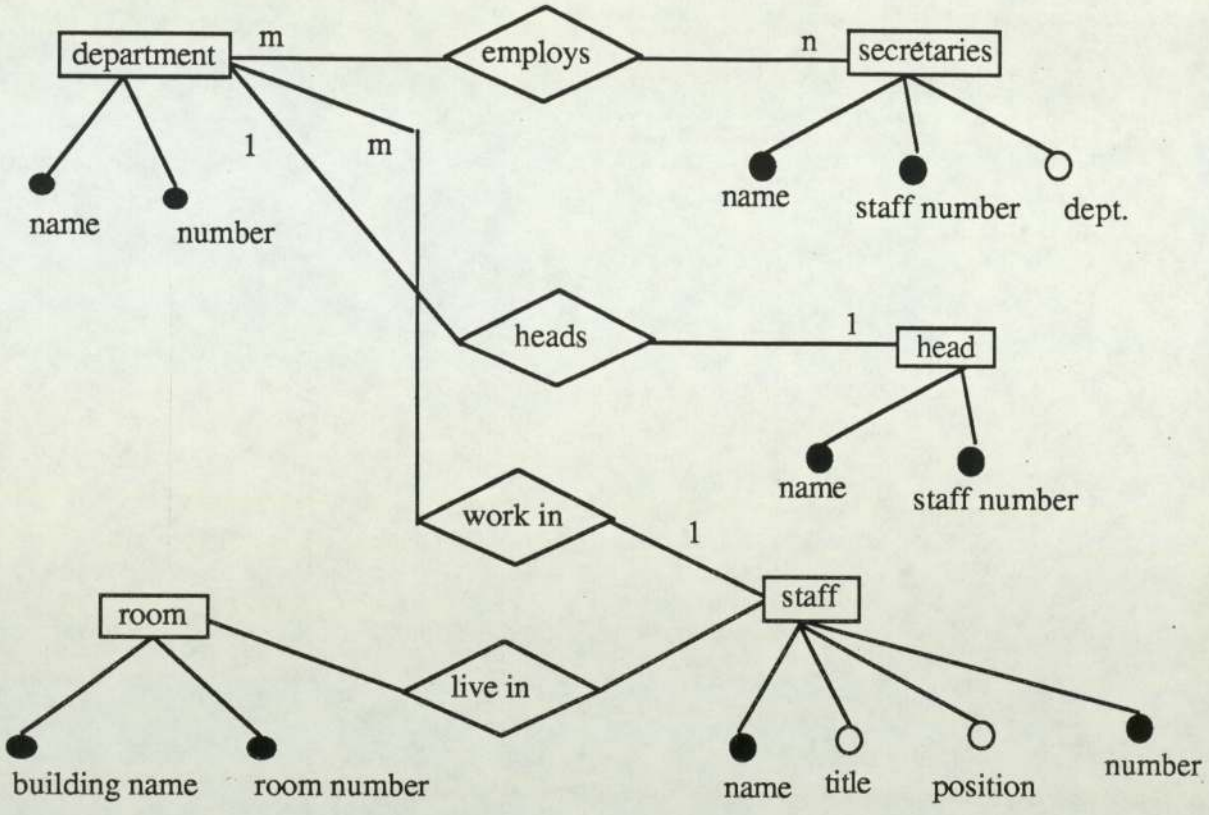
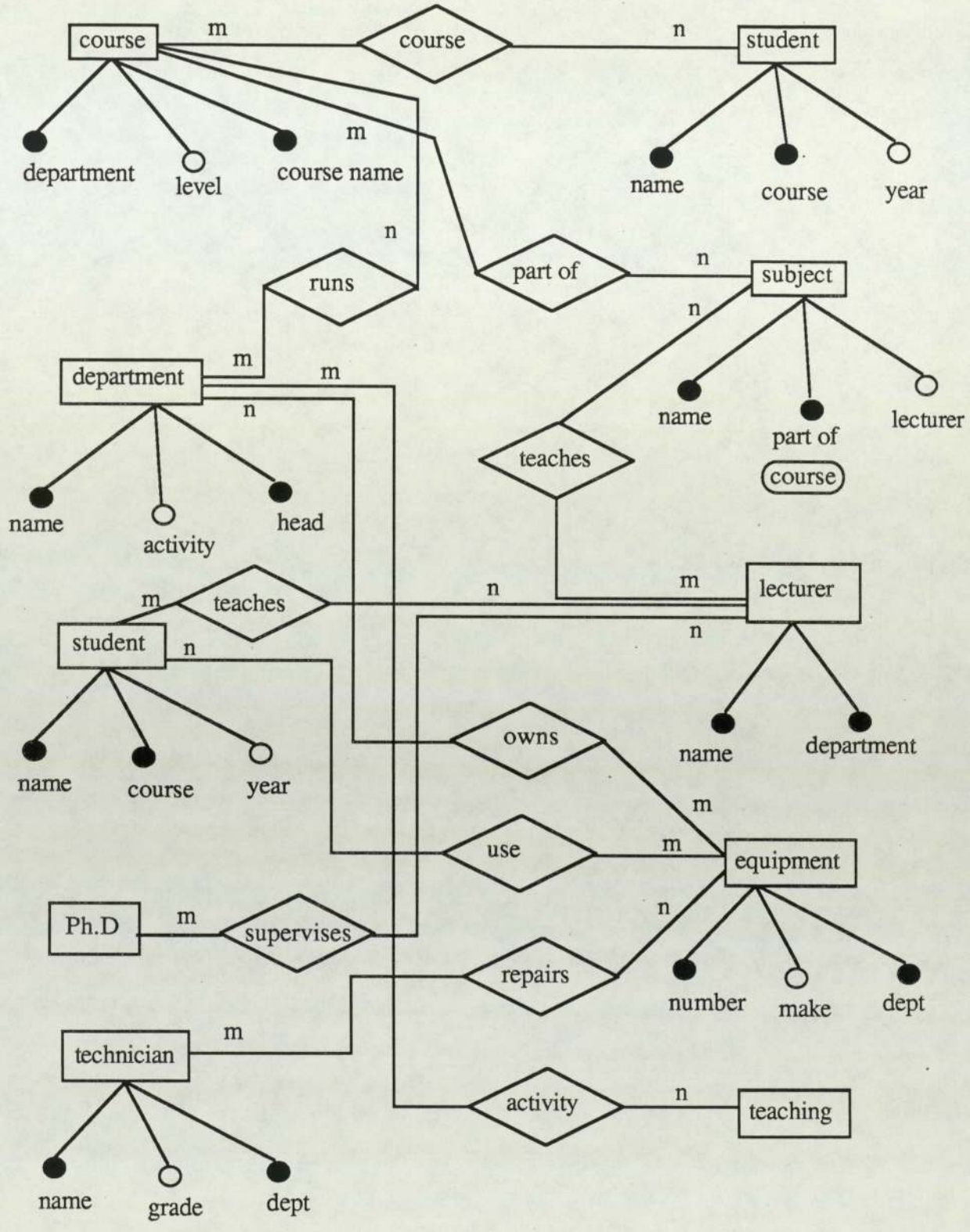
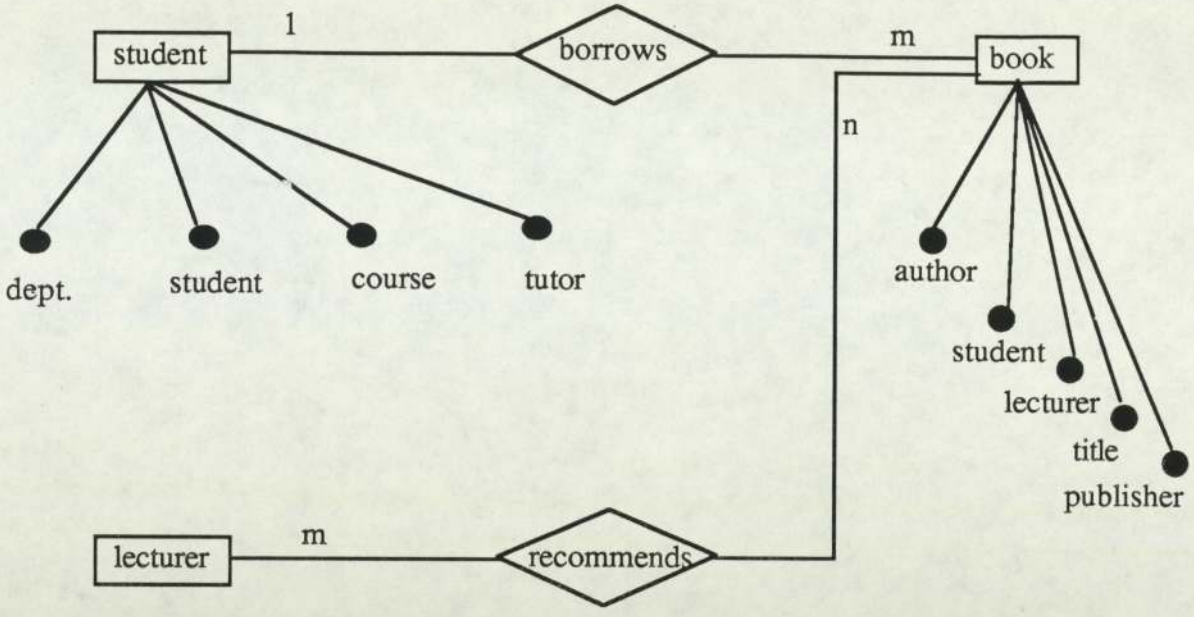
Adminstration view



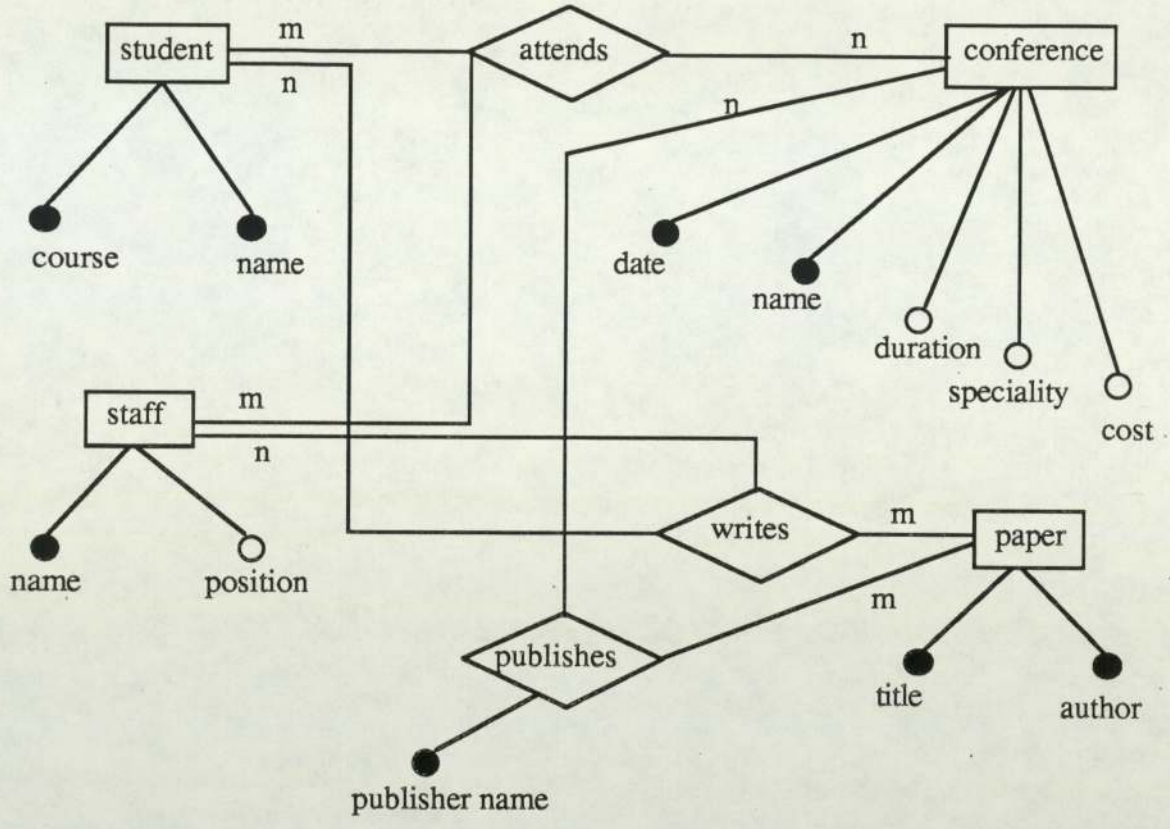
Teaching view



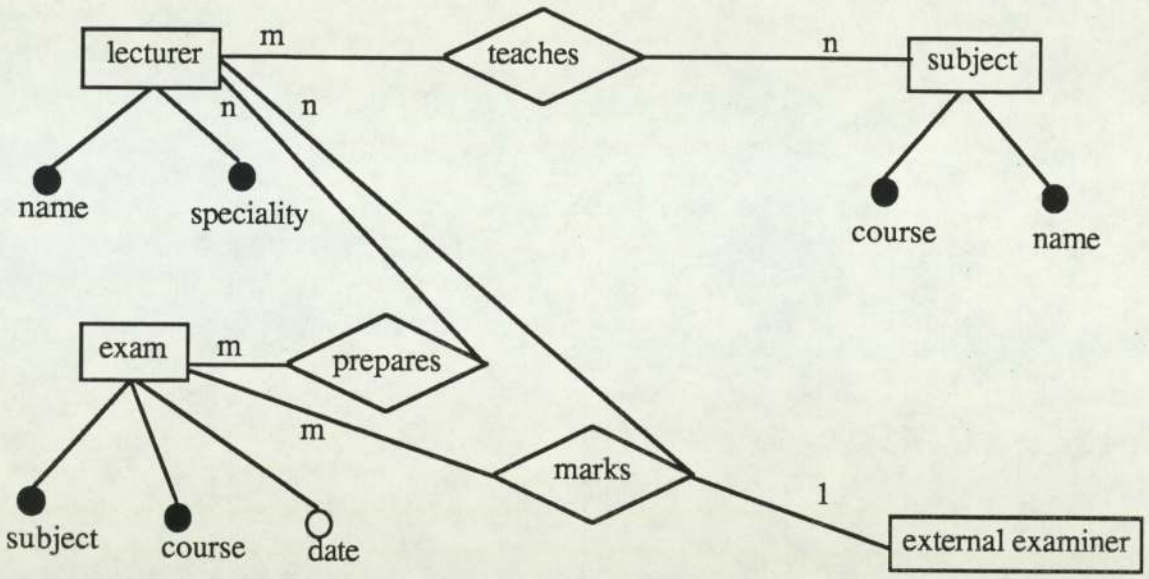
Library view



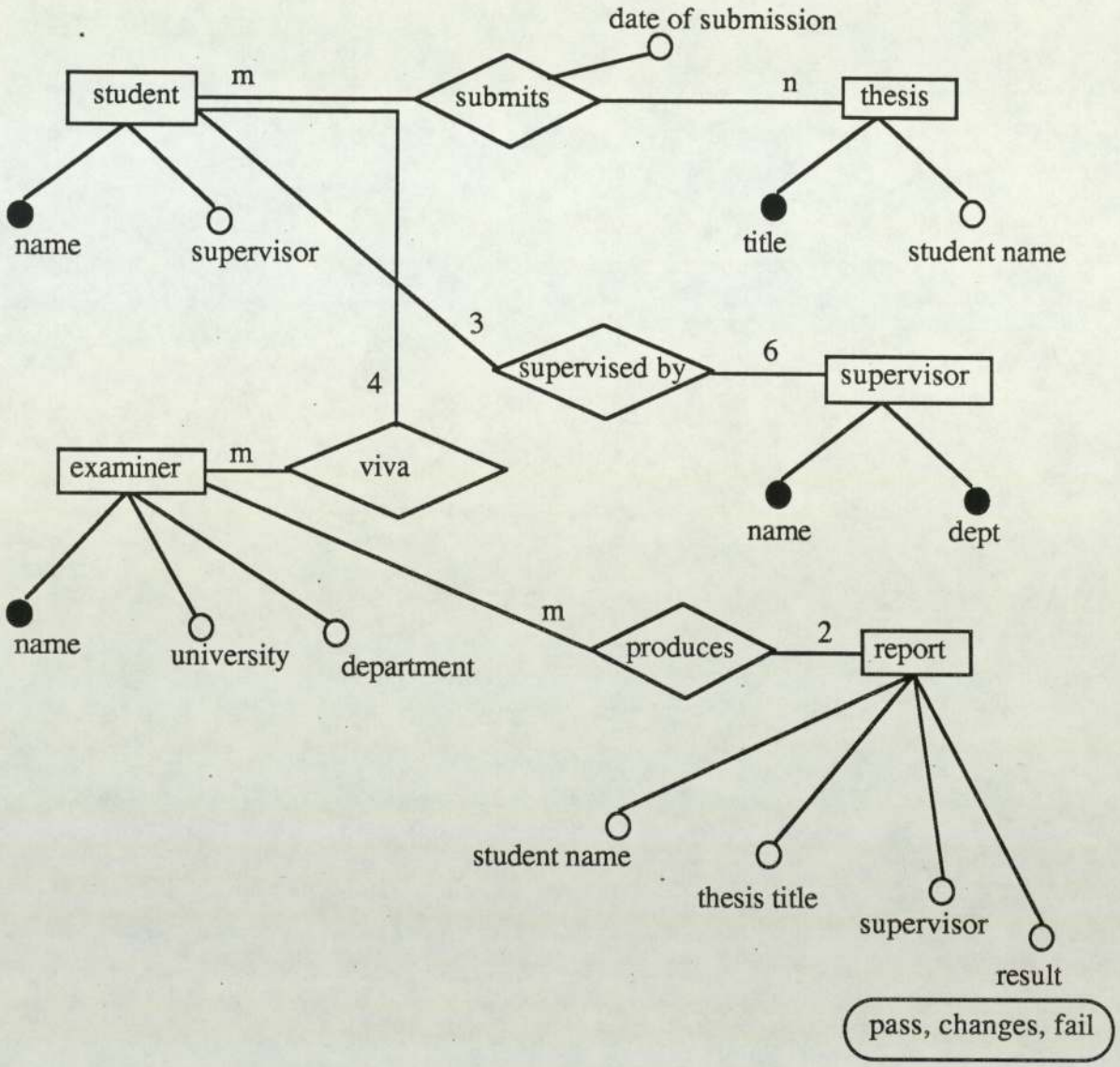
Conference view



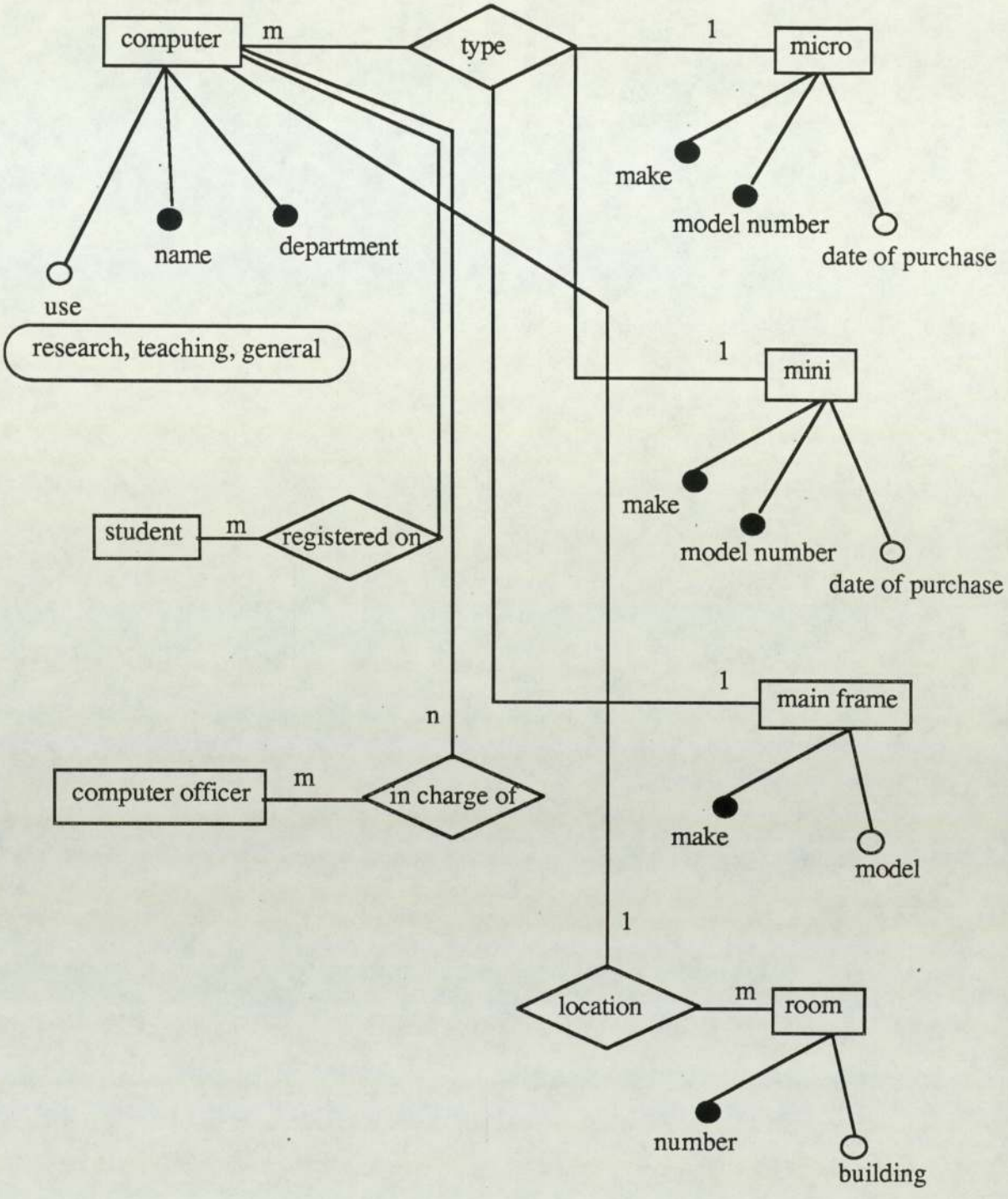
Exams view


lecturer
m
teaches
n
subject
n
n
name
speciality
course
name
exam
m
prepares
m
marks
1
subject
course
date
external examiner

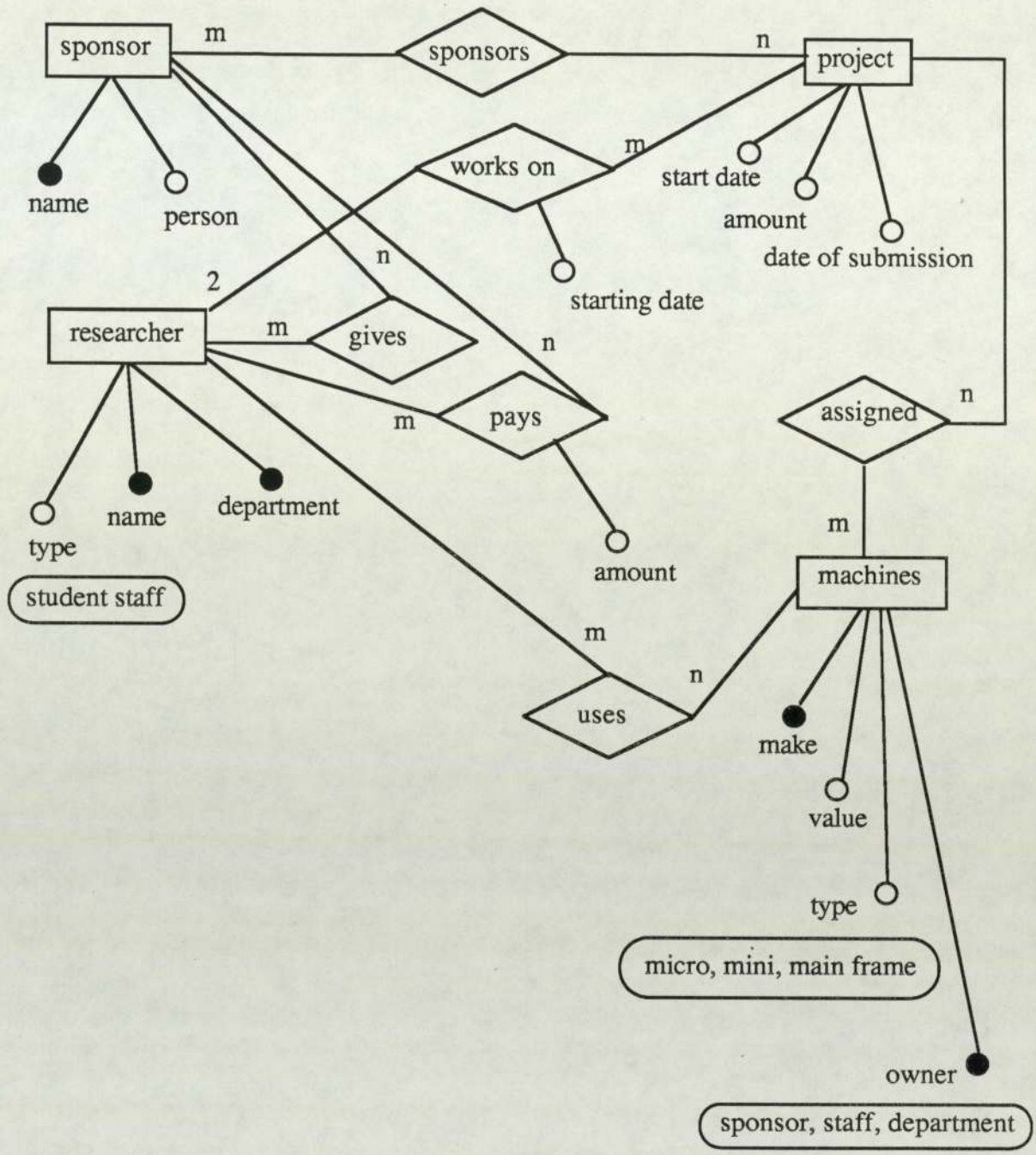
Research view



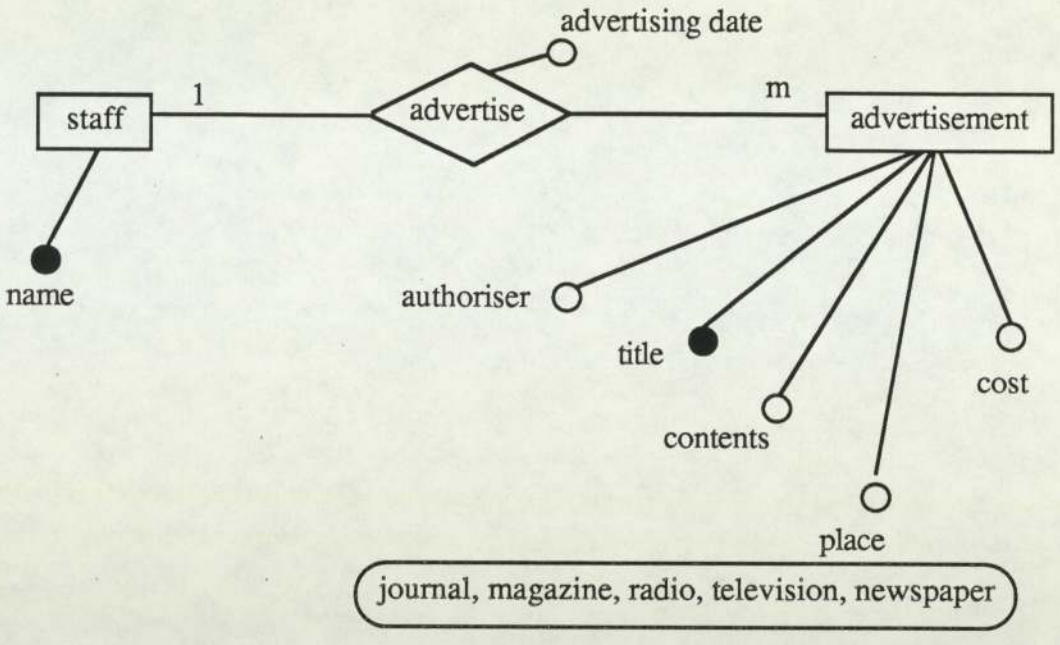
Computers view



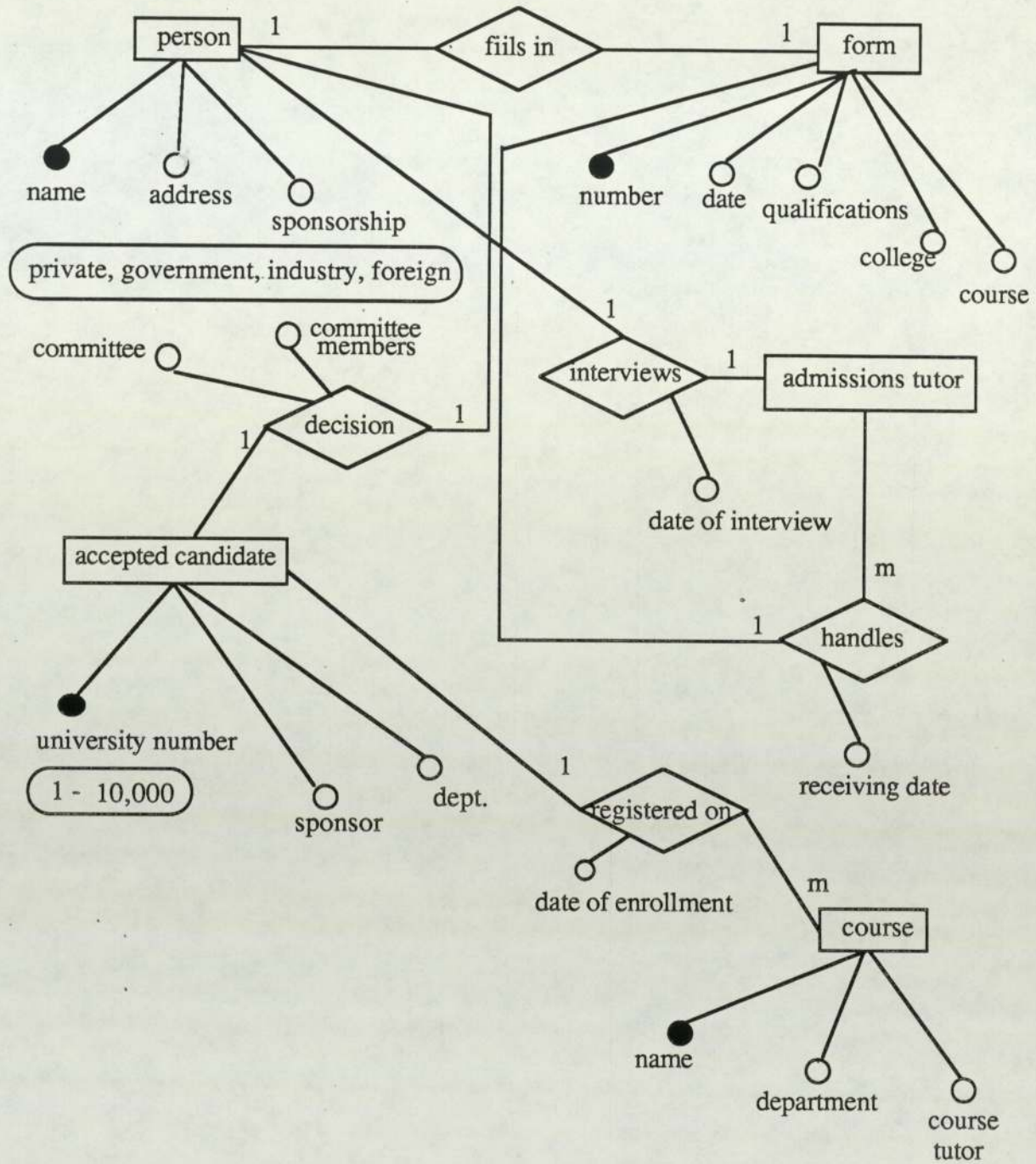
Contract research view



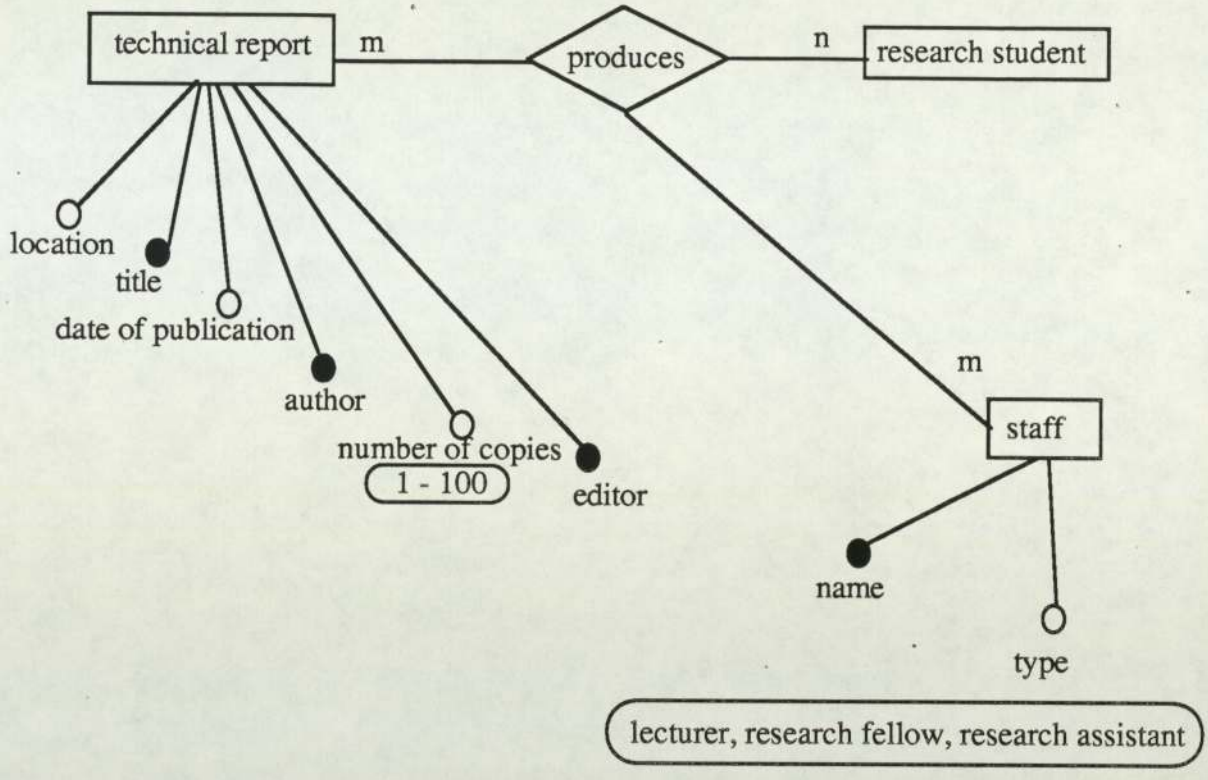
Publicity view



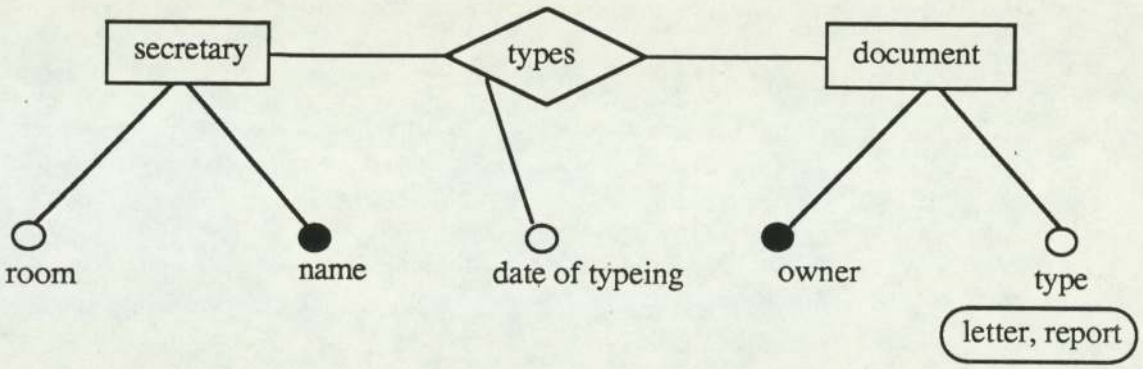
Admissions view



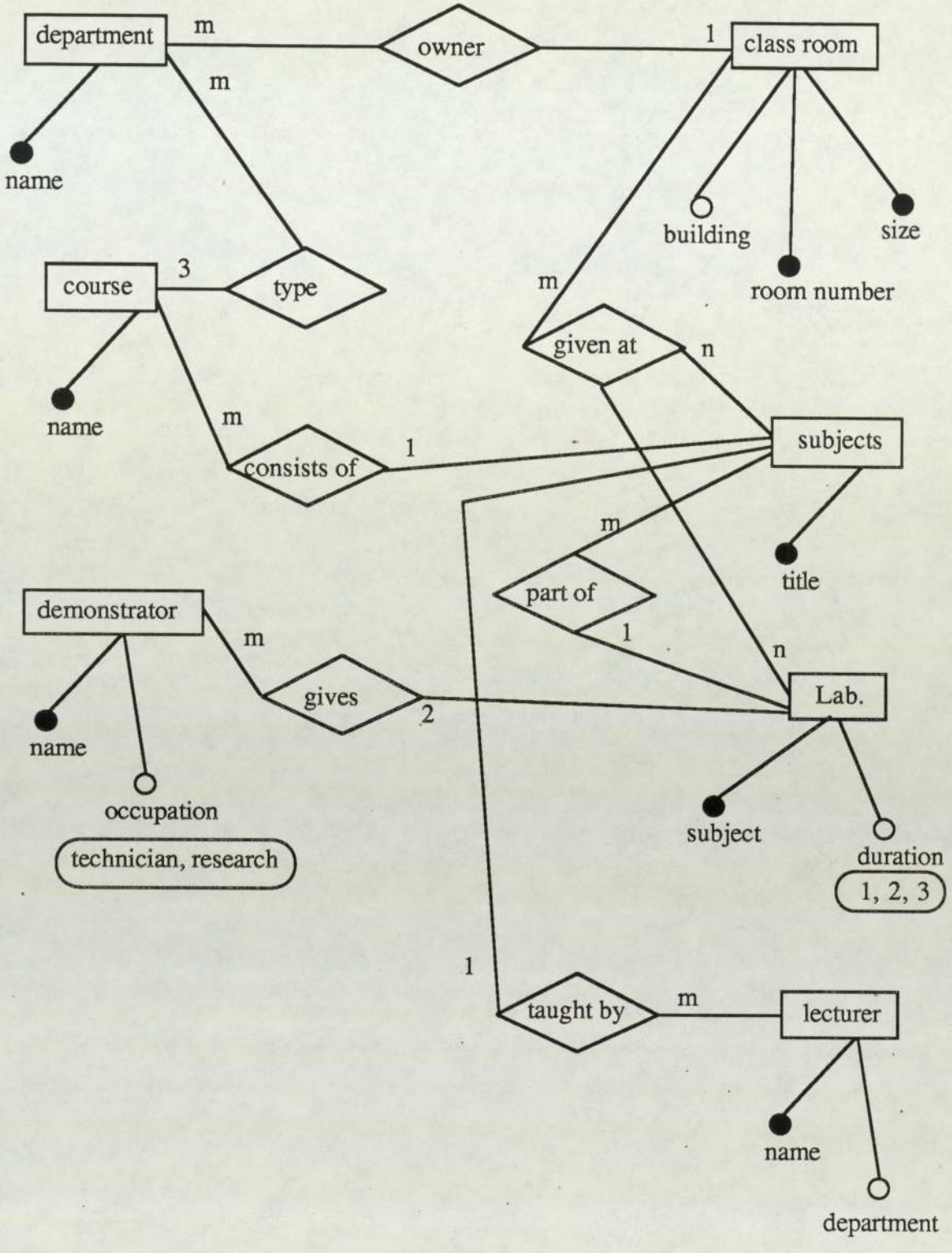
Internal publications view



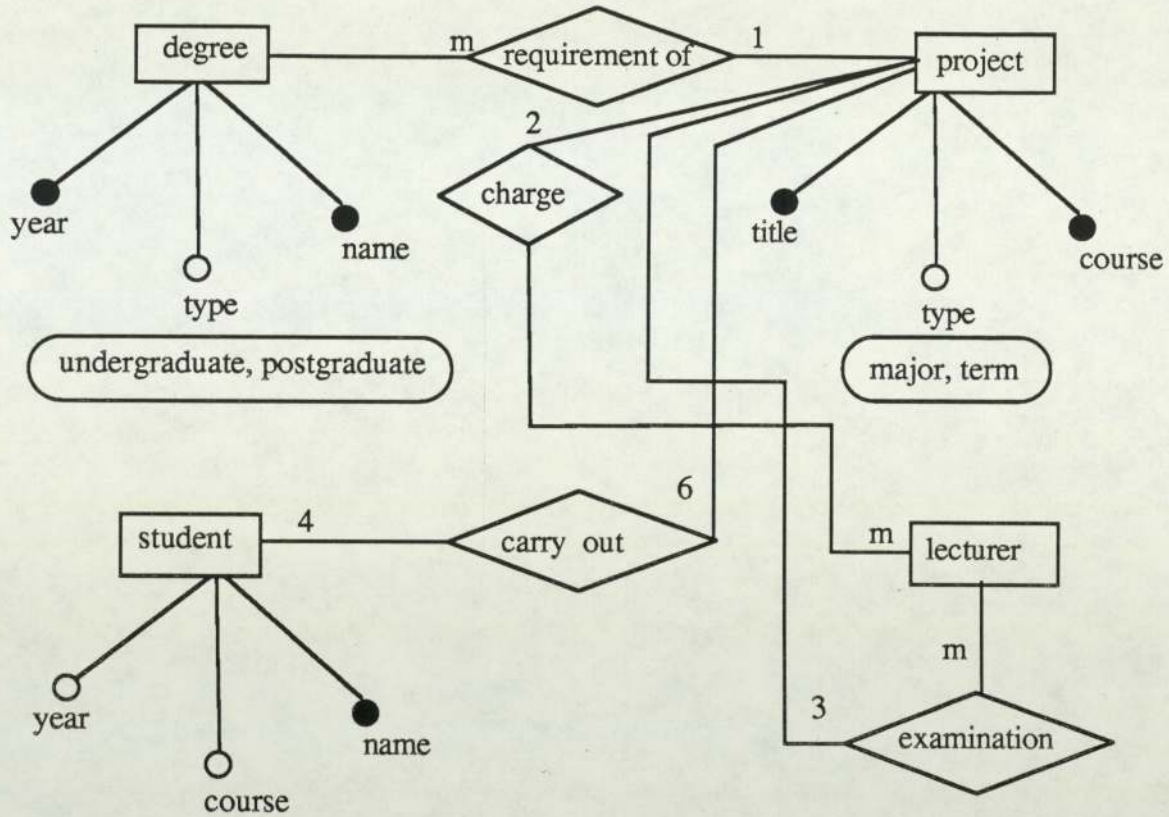
Secretarial view



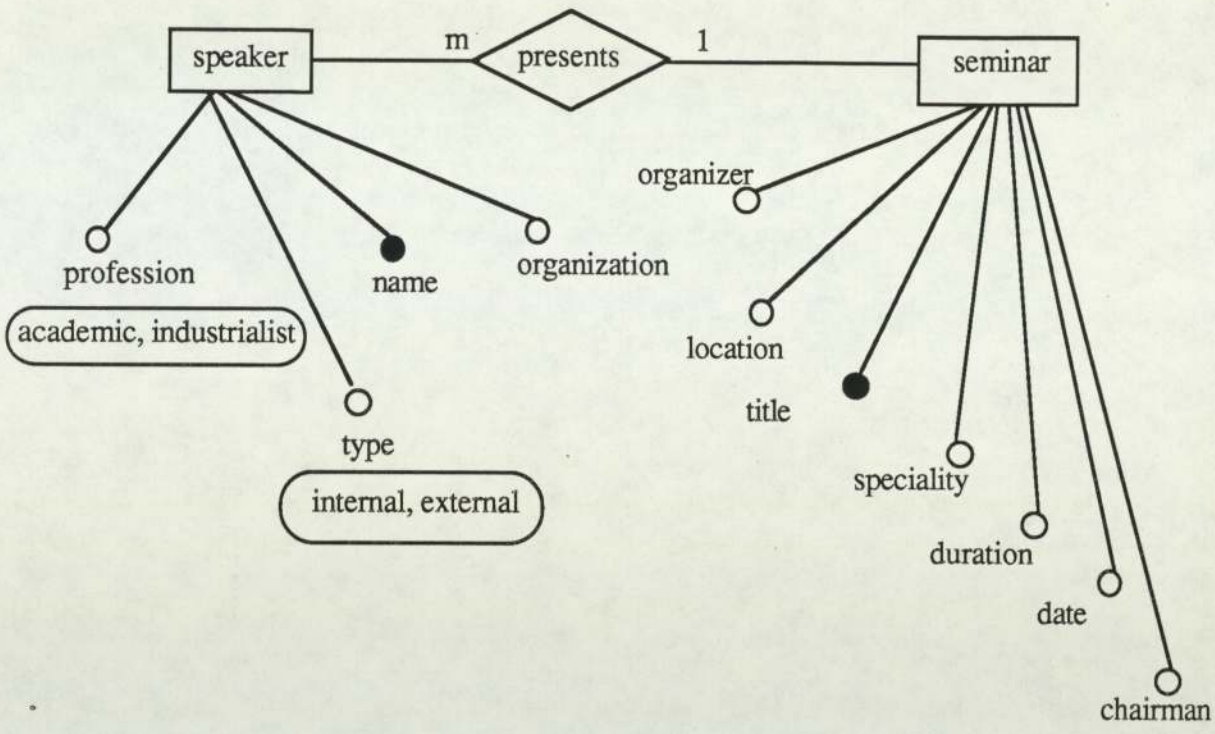
Time table view



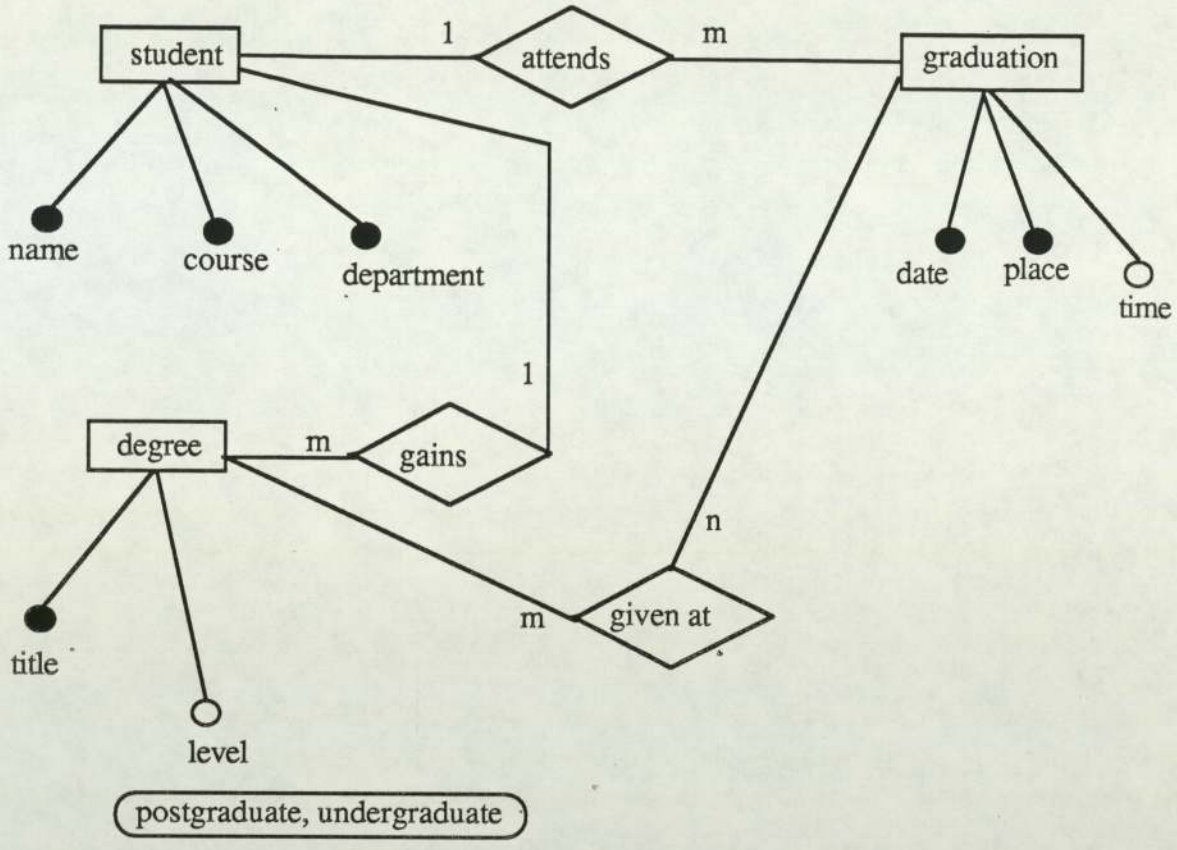
Course projects view



Seminars view



Graduation view



view adminstration

relationship [employs]

entity [department] cardinality [many]
attribute [name] key,
attribute [number] key,

entity [secretaries] cardinality [many]
attribute [name] key,
attribute [staff number] key,
attribute [dept.] notkey,

relationship [heads]

entity [department] cardinality [1]
attribute [name] key,
attribute [number] key,

entity [head] cardinality [1]
attribute [name] key,
attribute [staff No.] notkey,

relationship [work in]

entity [department] cardinality [many]
attribute [name] key,
attribute [number] key,

entity [staff] cardinality [1]
attribute [name] key,
attribute [title] notkey,
attribute [position] notkey,
attribute [number] key,

relationship [live in]

entity [staff] cardinality [many]
attribute [name] key,
attribute [title] notkey,
attribute [position] notkey,
attribute [number] key,

entity [room] cardinality [many]
attribute [building name] key,
attribute [room number] key,

view teaching

relationship [course]

entity [course] cardinality [many]
attribute [department] key,
attribute [level] notkey,
attribute [course name] key,

entity [student] cardinality [many]
attribute [name] key,
attribute [course] key,
attribute [year] notkey,

relationship [part of]

entity [subject] cardinality [many]
attribute [name] key,
attribute [part of] key, values [course],
attribute [lecturer] notkey,

entity [course] cardinality [many]
attribute [department] key,
attribute [level] notkey,
attribute [course name] key,

relationship [runs]

entity [department] cardinality [many]
attribute [name] key,
attribute [activity] notkey,
attribute [head] key,

entity [course] cardinality [many]
attribute [department] key,
attribute [level] notkey,
attribute [course name] key,

relationship [teaches]

entity [lecturer] cardinality [many]
attribute [name] key,
attribute [department] key,

entity [subject] cardinality [many]
attribute [name] key,
attribute [part of] key, values [course],
attribute [lecturer] notkey,

relationship [use]

entity [student] cardinality [many]
attribute [name] key,

attribute [course] key,
attribute [year] notkey,

entity [equipment] cardinality [many]
attribute [number] key,
attribute [make] notkey,
attribute [dept] key,

relationship [owns]

entity [department] cardinality [many]
attribute [name] key,
attribute [activity] notkey,
attribute [head] key,

entity [equipment] cardinality [many]
attribute [number] key,
attribute [make] notkey,
attribute [dept] key,

relationship [supervises]

entity [lecturer] cardinality [many]
attribute [name] key,
attribute [department] key,

entity [Ph.D] cardinality [many]

relationship [activity]

entity [department] cardinality [many]
attribute [name] key,
attribute [activity] notkey,
attribute [head] key,

entity [teaching] cardinality [many]

relationship [teaches]

entity [lecturer] cardinality [many]
attribute [position] notkey,
attribute [name] key,
attribute [department] key,

entity [student] cardinality [many]

relationship [repairs]

entity [technician] cardinality [many]
attribute [name] key,
attribute [grade] notkey,
attribute [dept] key,

```
entity [equipment] cardinality [many]
       attribute [number] key,
       attribute [make] notkey,
       attribute [dept] key,
```

view library

relationship [borrow]

entity [students] cardinality [1]
attribute [dept] key,
attribute [student] key,
attribute [course] key,
attribute [tutor] key,

entity [book] cardinality [many]
attribute [author] key,
attribute [student] key,
attribute [lecturer] key,
attribute [title] key,
attribute [publisher] key,

relationship [recommends]

entity [lecturer] cardinality [many]
attribute [department] key,
attribute [name] key,
attribute [title] key,

entity [book] cardinality [many]
attribute [author] key,
attribute [student] key,
attribute [lecturer] key,
attribute [title] key,
attribute [publisher] key,

view conference

relationship [attends]

entity [student] cardinality [many]
attribute [course] key,
attribute [name] key,

entity [conference] cardinality [many]
attribute [date] key,
attribute [name] key,
attribute [duration] notkey,
attribute [speciality] notkey,
attribute [location] notkey,
attribute [cost] notkey,

relationship [attends]

entity [staff] cardinality [many]
attribute [name] key,
attribute [position] notkey,

entity [conference] cardinality [many]
attribute [date] key,
attribute [name] key,
attribute [duration] notkey,
attribute [speciality] notkey,
attribute [location] notkey,
attribute [cost] notkey,

relationship [writes]

entity [student] cardinality [many]
attribute [course] key,
attribute [name] key,

entity [paper] cardinality [many]
attribute [title] key,
attribute [author] key,

relationship [writes]

entity [staff] cardinality [many]
attribute [name] key,
attribute [position] notkey,

entity [paper] cardinality [many]
attribute [title] key,
attribute [author] key,

relationship [publishes]

attribute [publisher name] key,

entity [conference] cardinality [many]
attribute [date] key,
attribute [name] key,
attribute [duration] notkey,
attribute [speciality] notkey,
attribute [location] notkey,
attribute [cost] notkey,

entity [paper] cardinality [many]
attribute [title] key,
attribute [author] key,

view exams

relationship [teaches]

entity [lecturer] cardinality [many]
attribute [name] key,
attribute [speciality] key,

entity [subject] cardinality [many]
attribute [course] key,
attribute [name] key,

relationship [prepares]

entity [lecturer] cardinality [many]
attribute [name] key,
attribute [speciality] key,

entity [exam] cardinality [many]
attribute [subject] key,
attribute [course] key,
attribute [date] notkey,

relationship [marks]

entity [lecturer] cardinality [many]
attribute [name] key,
attribute [speciality] key,

entity [exam] cardinality [many]
attribute [subject] key,
attribute [course] key,
attribute [date] notkey,

relationship [marks]

entity [external examiner] cardinality [1]
attribute [name] key,
attribute [address] key,

entity [exam] cardinality [many]
attribute [subject] key,
attribute [course] key,
attribute [date] notkey,

view research

relationship [submits]

attribute [date of submission] notkey,

entity [student] cardinality [many]
attribute [name] key,
attribute [supervisor] notkey,

entity [thesis] cardinality [many]
attribute [title] key,
attribute [student name] key,

relationship [supervised by]

entity [student] cardinality [3]
attribute [name] key,
attribute [supervisor] notkey,

entity [supervisor] cardinality [6]
attribute [name] key,
attribute [dept] key,

relationship [viva]

entity [student] cardinality [4]
attribute [name] key,
attribute [supervisor] notkey,

entity [examiner] cardinality [many]
attribute [name] key,
attribute [university] notkey,
attribute [department] notkey,

relationship [produces]

entity [examiner] cardinality [many]
attribute [name] key,
attribute [university] notkey,
attribute [department] notkey,

entity [report] cardinality [2]
attribute [student name] notkey,
attribute [thesis title] key,
attribute [supervisor] key,
attribute [result] noykey, values [pass,changes,fail],

view computers

relationship [type]

entity [computer] cardinality [many]
attribute [use] notkey, values [research,teaching,general],
attribute [name] key,
attribute [department] key,

entity [micro] cardinality [1]
attribute [make] key,
attribute [model number] key,
attribute [date of purchase] notkey,

relationship [type]

entity [computer] cardinality [many]
attribute [use] notkey, values [research,teaching,general],
attribute [name] key,
attribute [department] key,

entity [mini] cardinality [1]
attribute [make] key,
attribute [model number] key,
attribute [date of purchase] notkey,

relationship [type]

entity [computer] cardinality [many]
attribute [use] notkey, values [research,teaching,general],
attribute [name] key,
attribute [department] key,

entity [main frame] cardinality [1]
attribute [make] key,
attribute [model] notkey,

relationship [registered on]

entity [computer] cardinality [many]
attribute [use] notkey, values [research,teaching,general],
attribute [name] key,
attribute [department] key,

entity [student] cardinality [many]
attribute [name] key,
attribute [department] key,
attribute [department] key,

relationship [in charge of]

entity [computer] cardinality [many]
attribute [use] notkey, values [research,teaching,general],

attribute [name] key,
attribute [department] key,

entity [computer officer] cardinality [many]
attribute [name] key,
attribute [staff number] key,
attribute [grade] notkey,

relationship [location]

entity [computer] cardinality [1]
attribute [use] notkey, values [research,teaching,general],
attribute [name] key,
attribute [department] key,

entity [room] cardinality [many]
attribute [building] notkey,
attribute [number] key,

view contract research

relationship [sponsors]

entity [sponsor] cardinality [many]
attribute [name] key,
attribute [person] notkey,

entity [project] cardinality [many]
attribute [start date] notkey,
attribute [amount] notkey,
attribute [date of submission] notkey,

relationship [gives]

entity [sponsor] cardinality [many]
attribute [name] key,
attribute [person] notkey,

entity [researcher] cardinality [many]
attribute [type] notkey, values [student,staff],
attribute [name] key,
attribute [department] key,

relationship [pays]

attribute [amount] notkey,

entity [sponsor] cardinality [many]
attribute [name] key,
attribute [person] notkey,

entity [researcher] cardinality [many]
attribute [type] notkey, values [student,staff],
attribute [name] key,
attribute [department] key,

relationship [works on]

attribute [starting date] notkey,

entity [project] cardinality [many]
attribute [start date] notkey,
attribute [amount] notkey,
attribute [date of submission] notkey,

entity [researcher] cardinality [2]
attribute [type] notkey, values [student,staff],
attribute [name] key,
attribute [department] key,

relationship [assigned]

entity [project] cardinality [many]
attribute [start date] notkey,
attribute [amount] notkey,
attribute [date of submission] notkey,

entity [machines] cardinality [many]
attribute [owner] key, values [sponsor,staff,department],
attribute [make] key,
attribute [type] notkey, values [micro,mini,main frame],
attribute [value] notkey,

relationship [uses]

entity [researcher] cardinality [many]
attribute [type] notkey, values [student,staff],
attribute [name] key,
attribute [department] key,

entity [machines] cardinality [many]
attribute [owner] key, values [sponsor,staff,department],
attribute [make] key,
attribute [type] notkey, values [micro,mini,main frame],
attribute [value] notkey,

view publicity

relationship [advertises]

attribute [advertising date] notkey,

entity [staff] cardinality [1]
attribute [name] key,

entity [advertisement] cardinality [many]
attribute [authoriser] notkey,
attribute [title] key,
attribute [contents] notkey,
attribute [place] notkey,
values [journal,magazine,radio,television,newspaper],
attribute [cost] notkey,

view admissions

relationship [fills in]

entity [person] cardinality [1]
attribute [name] key,
attribute [address] notkey,
attribute [sponsorship] notkey,
values [private,government,industry,foreign],

entity [form] cardinality [1]
attribute [number] key,
attribute [date] notkey,
attribute [qualifications] notkey,
attribute [college] notkey,
attribute [course] notkey,

relationship [interviews]

attribute [date of interview] notkey,

entity [person] cardinality [1]
attribute [name] key,
attribute [address] notkey,
attribute [sponsorship] notkey,
values [private,government,industry,foreign],

entity [admisions tutor] cardinality [1]

relationship [handles]

attribute [receiving date] notkey,

entity [form] cardinality [1]
attribute [number] key,
attribute [date] notkey,
attribute [qualifications] notkey,
attribute [college] notkey,
attribute [course] notkey,

entity [admisions tutor] cardinality [many]

relationship [decision]

attribute [committee] notkey,
attribute [committee members] notkey,

entity [person] cardinality [1]
attribute [name] key,
attribute [address] notkey,
attribute [sponsorship] notkey,
values [private,government,industry,foreign],

entity [accepted candidate] cardinality [1]

attribute [university number] key, values [01-10,000],
attribute [sponsor] notkey,
attribute [dept.] notkey,

relationship [registered on]

attribute [date of enrollment] notkey,

entity [accepted candidate] cardinality [1]
attribute [university number] key, values [01-10,000],
attribute [sponsor] notkey,
attribute [dept.] notkey,

entity [course] cardinality [many]
attribute [name] key,
attribute [department] notkey,
attribute [course tutor] notkey,

view internal publications

relationship [produces]

entity [technical report] cardinality [many]
attribute [location] notkey,
attribute [title] key,
attribute [date of publication] notkey,
attribute [author] key,
attribute [number of copies] notkey, values [1-100],
attribute [editor] key,

entity [research student] cardinality [many]
attribute [name] key,

relationship [produces]

entity [technical report] cardinality [many]
attribute [location] notkey,
attribute [title] key,
attribute [date of publication] notkey,
attribute [author] key,
attribute [number of copies] notkey, values [1-100],
attribute [editor] key,

entity [staff] cardinality [many]
attribute [type] notkey,
values [lecturer,research fellow,research assistant],
attribute [name] key,

view secretarial

relationship [types]

attribute [date of typing] notkey,

entity [secretary] cardinality [many]
attribute [room] notkey,
attribute [name] key,

entity [document] cardinality [1]
attribute [type] notkey, values [letter,report],
attribute [owner] key,

view time table

relationship [owner]

entity [department] cardinality [many]
attribute [name] key,

entity [class room] cardinality [1]
attribute [building] notkey,
attribute [room number] key,
attribute [size] key,

relationship [runs]

entity [department] cardinality [many]
attribute [name] key,

entity [course] cardinality [3]
attribute [name] key,

relationship [consists of]

entity [course] cardinality [many]
attribute [name] key,

entity [subjects] cardinality [1]
attribute [title] key,

relationship [given at]

entity [class room] cardinality [many]
attribute [building] notkey,
attribute [room number] key,
attribute [size] key,

entity [subjects] cardinality [many]
attribute [title] key,

relationship [given at]

entity [Lab.] cardinality [many]
attribute [subject] key,
attribute [duration] notkey, values [1,2,3],

entity [class room] cardinality [many]
attribute [building] notkey,
attribute [room number] key,
attribute [size] key,

relationship [part of]

entity [Lab.] cardinality [1]

attribute [subject] key,
attribute [duration] notkey, values [1,2,3],

entity [subjects] cardinality [many]
attribute [title] key,

relationship [gives]

entity [Lab.] cardinality [2]
attribute [subject] key,
attribute [duration] notkey, values [1,2,3],

entity [demonstrator] cardinality [many]
attribute [name] key,
attribute [occupation] notkey, values [technician,research student,lecturer],

relationship [taught by]

entity [lecturer] cardinality [many]
attribute [name] key,
attribute [department] key,

entity [subjects] cardinality [1]
attribute [title] key,

view course projects

relationship [requirement of]

entity [degree] cardinality [many]
attribute [year] key,
attribute [type] notkey, values [undergraduate,postgraduate],
attribute [name] key,

entity [project] cardinality [1]
attribute [type] notkey, values [major,term],
attribute [title] key,
attribute [course] key,

relationship [carry out]

entity [project] cardinality [6]
attribute [type] notkey, values [major,term],
attribute [title] key,
attribute [course] key,

entity [student] cardinality [4]
attribute [name] key,
attribute [year] notkey,
attribute [course] key,

relationship [examination]

entity [project] cardinality [3]
attribute [type] notkey, values [major,term],
attribute [title] key,
attribute [course] key,

entity [lecturer] cardinality [many]
attribute [name] notkey,
attribute [department] key,

relationship [charge]

entity [project] cardinality [2]
attribute [type] notkey, values [major,term],
attribute [title] key,
attribute [course] key,

entity [lecturer] cardinality [many]
attribute [name] notkey,
attribute [department] key,

view seminars

relationship [presents]

entity [speaker] cardinality [many]
attribute [profession] notkey, values [academic,industrialist],
attribute [type] notkey, values [internal,external],
attribute [name] key,
attribute [organization] notkey,

entity [seminar] cardinality [1]
attribute [organizer] notkey,
attribute [location] notkey,
attribute [title] key,
attribute [speciality] notkey,
attribute [chairman] notkey,
attribute [duration] notkey,
attribute [date] notkey,

view graduation

relationship [attends]

entity [student] cardinality [1]
attribute [name] key,
attribute [course] key,
attribute [Dept.] key,

entity [graduation] cardinality [many]
attribute [date] key,
attribute [place] key,
attribute [time] notkey,

relationship [gains]

entity [student] cardinality [1]
attribute [name] key,
attribute [course] key,
attribute [Dept.] key,

entity [degree] cardinality [many]
attribute [title] key,
attribute [level] notkey, values [postgraduate,undergraduate],

relationship [given at]

entity [degree] cardinality [many]
attribute [title] key,
attribute [level] notkey, values [postgraduate,undergraduate],

entity [graduation] cardinality [many]
attribute [date] key,
attribute [place] key,
attribute [time] notkey,

relationship [heads]

entity [department] cardinality [1]
attribute [number], key,
attribute [activity], notkey,
attribute [head], key,
attribute [name], key,

entity [head] cardinality [1]
attribute [name], key,
attribute [staff No.], notkey,

relationship [employs]

entity [department] cardinality [many]
attribute [number], key,
attribute [activity], notkey,
attribute [head], key,
attribute [name], key,

entity [secretaries] cardinality [many]
attribute [name], key,
attribute [staff number], key,
attribute [dept.], notkey,

relationship [work in]

entity [department] cardinality [many]
attribute [number], key,
attribute [activity], notkey,
attribute [head], key,
attribute [name], key,

entity [staff] cardinality [1]
attribute [title], notkey,
attribute [number], key,
attribute [position], notkey,
attribute [type], notkey,
values [lecturer,research fellow,research assistant]
attribute [name], key,

relationship [live in]

entity [staff] cardinality [many]
attribute [title], notkey,
attribute [number], key,
attribute [position], notkey,
attribute [type], notkey,
values [lecturer,research fellow,research assistant]
attribute [name], key,

entity [room] cardinality [many]
attribute [building name], key,
attribute [room number], key,

relationship [course]

entity [course] cardinality [many]
attribute [level], notkey,
attribute [course name], key,
attribute [department], key,
attribute [course tutor], notkey,
attribute [name], key,

entity [student] cardinality [many]
attribute [supervisor], notkey,
attribute [year], notkey,
attribute [name], key,
attribute [course], key,
attribute [Dept.], key,

relationship [teaches]

entity [lecturer] cardinality [many]
attribute [title], key,
attribute [speciality], key,
attribute [name], key,
attribute [department], key,

entity [subject] cardinality [many]
attribute [part of], key, values [course]
attribute [lecturer], notkey,
attribute [course], key,
attribute [name], key,

relationship [use]

entity [student] cardinality [many]
attribute [supervisor], notkey,
attribute [year], notkey,
attribute [name], key,
attribute [course], key,
attribute [Dept.], key,

entity [equipment] cardinality [many]
attribute [number], key,
attribute [make], notkey,
attribute [dept], key,

relationship [part of]

entity [subject] cardinality [many]
attribute [part of], key, values [course]
attribute [lecturer], notkey,
attribute [course], key,
attribute [name], key,

entity [course] cardinality [many]

attribute [level], notkey,
attribute [course name], key,
attribute [department], key,
attribute [course tutor], notkey,
attribute [name], key,

relationship [repairs]

entity [technician] cardinality [many]
attribute [name], key,
attribute [grade], notkey,
attribute [dept], key,

entity [equipment] cardinality [many]
attribute [number], key,
attribute [make], notkey,
attribute [dept], key,

relationship [teaches]

entity [lecturer] cardinality [many]
attribute [title], key,
attribute [speciality], key,
attribute [name], key,
attribute [department], key,

entity [student] cardinality [many]
attribute [supervisor], notkey,
attribute [year], notkey,
attribute [name], key,
attribute [course], key,
attribute [Dept.], key,

relationship [runs]

entity [department] cardinality [many]
attribute [number], key,
attribute [activity], notkey,
attribute [head], key,
attribute [name], key,

entity [course] cardinality [many]
attribute [level], notkey,
attribute [course name], key,
attribute [department], key,
attribute [course tutor], notkey,
attribute [name], key,

relationship [activity]

entity [department] cardinality [many]
attribute [number], key,
attribute [activity], notkey,
attribute [head], key,

attribute [name], key,

entity [teaching] cardinality [many]

relationship [owns]

entity [department] cardinality [many]
attribute [number], key,
attribute [activity], notkey,
attribute [head], key,
attribute [name], key,

entity [equipment] cardinality [many]
attribute [number], key,
attribute [make], notkey,
attribute [dept], key,

relationship [supervises]

entity [lecturer] cardinality [many]
attribute [title], key,
attribute [speciality], key,
attribute [name], key,
attribute [department], key,

entity [Ph.D] cardinality [many]

relationship [borrow]

entity [students] cardinality [1]
attribute [dept], key,
attribute [student], key,
attribute [course], key,
attribute [tutor], key,

entity [book] cardinality [many]
attribute [author], key,
attribute [student], key,
attribute [lecturer], key,
attribute [title], key,
attribute [publisher], key,

relationship [recommends]

entity [lecturer] cardinality [many]
attribute [title], key,
attribute [speciality], key,
attribute [name], key,
attribute [department], key,

entity [book] cardinality [many]
attribute [author], key,
attribute [student], key,
attribute [lecturer], key,

attribute [title], key,
attribute [publisher], key,

relationship [attends]

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attribute [course], key,
attribute [Dept.], key,

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attribute [date], key,
attribute [name], key,
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attribute [speciality], notkey,
attribute [location], notkey,
attribute [cost], notkey,

relationship [attends]

entity [staff] cardinality [many]
attribute [title], notkey,
attribute [number], key,
attribute [position], notkey,
attribute [type], notkey,
values [lecturer,research fellow,research assistant]
attribute [name], key,

entity [conference] cardinality [many]
attribute [date], key,
attribute [name], key,
attribute [duration], notkey,
attribute [speciality], notkey,
attribute [location], notkey,
attribute [cost], notkey,

relationship [writes]

entity [student] cardinality [many]
attribute [supervisor], notkey,
attribute [year], notkey,
attribute [name], key,
attribute [course], key,
attribute [Dept.], key,

entity [paper] cardinality [many]
attribute [title], key,
attribute [author], key,

relationship [writes]

entity [staff] cardinality [many]
attribute [title], notkey,
attribute [number], key,
attribute [position], notkey,
attribute [type], notkey,
values [lecturer,research fellow,research assistant]
attribute [name], key,

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attribute [author], key,

relationship [publishes]
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attribute [location], notkey,
attribute [cost], notkey,

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attribute [author], key,

relationship [prepares]

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attribute [title], key,
attribute [speciality], key,
attribute [name], key,
attribute [department], key,

entity [exam] cardinality [many]
attribute [subject], key,
attribute [course], key,
attribute [date], notkey,

relationship [marks]

entity [lecturer] cardinality [many]
attribute [title], key,
attribute [speciality], key,
attribute [name], key,
attribute [department], key,

entity [exam] cardinality [many]
attribute [subject], key,
attribute [course], key,
attribute [date], notkey,

relationship [marks]

entity [external examiner] cardinality [1]
attribute [name], key,
attribute [address], key,

entity [exam] cardinality [many]
attribute [subject], key,
attribute [course], key,
attribute [date], notkey,

relationship [submits]
attribute [date of submission], notkey,

entity [student] cardinality [many]
attribute [supervisor], notkey,
attribute [year], notkey,
attribute [name], key,
attribute [course], key,
attribute [Dept.], key,

entity [thesis] cardinality [many]
attribute [title], key,
attribute [student name], key,

relationship [supervised by]

entity [student] cardinality [3]
attribute [supervisor], notkey,
attribute [year], notkey,
attribute [name], key,
attribute [course], key,
attribute [Dept.], key,

entity [supervisor] cardinality [6]
attribute [name], key,
attribute [dept], key,

relationship [viva]

entity [student] cardinality [4]
attribute [supervisor], notkey,
attribute [year], notkey,
attribute [name], key,
attribute [course], key,
attribute [Dept.], key,

entity [examiner] cardinality [many]
attribute [name], key,
attribute [university], notkey,
attribute [department], notkey,

relationship [produces]

entity [examiner] cardinality [many]
attribute [name], key,
attribute [university], notkey,
attribute [department], notkey,

entity [report] cardinality [2]
attribute [student name], notkey,
attribute [thesis title], key,
attribute [supervisor], key,
attribute [result], noykey, values [pass,changes,fail]

relationship [type]

entity [computer] cardinality [many]
attribute [use], notkey, values [research,teaching,general]
attribute [name], key,
attribute [department], key,

entity [micro] cardinality [1]
attribute [make], key,
attribute [model number], key,
attribute [date of purchase], notkey,

relationship [type]

entity [computer] cardinality [many]
attribute [use], notkey, values [research,teaching,general]
attribute [name], key,
attribute [department], key,

entity [mini] cardinality [1]
attribute [make], key,
attribute [model number], key,
attribute [date of purchase], notkey,

relationship [type]

entity [computer] cardinality [many]
attribute [use], notkey, values [research,teaching,general]
attribute [name], key,
attribute [department], key,

entity [main frame] cardinality [1]
attribute [make], key,
attribute [model], notkey,

relationship [in charge of]

entity [computer] cardinality [many]
attribute [use], notkey, values [research,teaching,general]
attribute [name], key,
attribute [department], key,

entity [computer officer] cardinality [many]

attribute [name], key,
attribute [staff number], key,
attribute [grade], notkey,

relationship [registered on]
attribute [date of enrollment], notkey,

entity [computer] cardinality [many]
attribute [use], notkey, values [research,teaching,general]
attribute [name], key,
attribute [department], key,

entity [student] cardinality [many]
attribute [supervisor], notkey,
attribute [year], notkey,
attribute [name], key,
attribute [course], key,
attribute [Dept.], key,

relationship [location]

entity [computer] cardinality [1]
attribute [use], notkey, values [research,teaching,general]
attribute [name], key,
attribute [department], key,

entity [room] cardinality [many]
attribute [building name], key,
attribute [room number], key,

relationship [sponsors]

entity [sponsor] cardinality [many]
attribute [name], key,
attribute [person], notkey,

entity [project] cardinality [many]
attribute [start date], notkey,
attribute [amount], notkey,
attribute [date of submission], notkey,
attribute [type], notkey, values [major,term]
attribute [title], key,
attribute [course], key,

relationship [gives]

entity [sponsor] cardinality [many]
attribute [name], key,
attribute [person], notkey,

entity [researcher] cardinality [many]
attribute [type], notkey, values [student,staff]
attribute [name], key,
attribute [department], key,

relationship [pays]
attribute [amount], notkey,

entity [sponsor] cardinality [many]
attribute [name], key,
attribute [person], notkey,

entity [researcher] cardinality [many]
attribute [type], notkey, values [student,staff]
attribute [name], key,
attribute [department], key,

relationship [works on]
attribute [starting date], notkey,

entity [project] cardinality [many]
attribute [start date], notkey,
attribute [amount], notkey,
attribute [date of submission], notkey,
attribute [type], notkey, values [major,term]
attribute [title], key,
attribute [course], key,

entity [researcher] cardinality [2]
attribute [type], notkey, values [student,staff]
attribute [name], key,
attribute [department], key,

relationship [assigned]

entity [project] cardinality [many]
attribute [start date], notkey,
attribute [amount], notkey,
attribute [date of submission], notkey,
attribute [type], notkey, values [major,term]
attribute [title], key,
attribute [course], key,

entity [machines] cardinality [many]
attribute [owner], key, values [sponsor,staff,department]
attribute [make], key,
attribute [type], notkey, values [micro,mini,main frame]
attribute [value], notkey,

relationship [uses]

entity [researcher] cardinality [many]
attribute [type], notkey, values [student,staff]
attribute [name], key,
attribute [department], key,

entity [machines] cardinality [many]
attribute [owner], key, values [sponsor,staff,department]

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                attribute [make], key,
                attribute [type], notkey, values [micro,mini,main frame]
                attribute [value], notkey,

relationship    [advertises]
                attribute [advertising date], notkey,

                entity  [staff]  cardinality [1]
                attribute [title], notkey,
                attribute [number], key,
                attribute [position], notkey,
                attribute [type], notkey,
                        values [lecturer,research fellow,research assistant]
                attribute [name], key,

                entity  [advertisement]  cardinality [many]
                attribute [authoriser], notkey,
                attribute [title], key,
                attribute [contents], notkey,
                attribute [place], notkey,
                        values [journal,magazine,radio,television,newspaper]
                attribute [cost], notkey,

relationship    [fills in]

                entity  [person]  cardinality [1]
                attribute [name], key,
                attribute [address], notkey,
                attribute [sponsorship], notkey,
                        values [private,government,industry,foreign]

                entity  [form]  cardinality [1]
                attribute [number], key,
                attribute [date], notkey,
                attribute [qualifications], notkey,
                attribute [college], notkey,
                attribute [course], notkey,

relationship    [interviews]
                attribute [date of interview], notkey,

                entity  [person]  cardinality [1]
                attribute [name], key,
                attribute [address], notkey,
                attribute [sponsorship], notkey,
                        values [private,government,industry,foreign]

                entity  [admisions tutor]  cardinality [1]

relationship    [handles]
                attribute [receiving date], notkey,

                entity  [form]  cardinality [1]
                attribute [number], key,
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attribute [date], notkey,
attribute [qualifications], notkey,
attribute [college], notkey,
attribute [course], notkey,

entity [admisions tutor] cardinality [many]

relationship [decision]
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attribute [committee members], notkey,

entity [person] cardinality [1]
attribute [name], key,
attribute [address], notkey,
attribute [sponsorship], notkey,
values [private,government,industry,foreign]

entity [accepted candidate] cardinality [1]
attribute [university number], key, values [01-10,000]
attribute [sponsor], notkey,
attribute [dept.], notkey,

relationship [registered on]
attribute [date of enrollment], notkey,

entity [accepted candidate] cardinality [1]
attribute [university number], key, values [01-10,000]
attribute [sponsor], notkey,
attribute [dept.], notkey,

entity [course] cardinality [many]
attribute [level], notkey,
attribute [course name], key,
attribute [department], key,
attribute [course tutor], notkey,
attribute [name], key,

relationship [produces]

entity [technical report] cardinality [many]
attribute [location], notkey,
attribute [title], key,
attribute [date of publication], notkey,
attribute [author], key,
attribute [number of copies], notkey, values [1-100]
attribute [editor], key,

entity [research student] cardinality [many]
attribute [name], key,

relationship [produces]

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entity [staff] cardinality [many]
attribute [title], notkey,
attribute [number], key,
attribute [position], notkey,
attribute [type], notkey,
values [lecturer,research fellow,research assistant]
attribute [name], key,

relationship [types]
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attribute [room], notkey,
attribute [name], key,

entity [document] cardinality [1]
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relationship [owner]

entity [department] cardinality [many]
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attribute [activity], notkey,
attribute [head], key,
attribute [name], key,

entity [class room] cardinality [1]
attribute [building], notkey,
attribute [room number], key,
attribute [size], key,

relationship [given at]

entity [class room] cardinality [many]
attribute [building], notkey,
attribute [room number], key,
attribute [size], key,

entity [subjects] cardinality [many]
attribute [title], key,

relationship [consists of]

entity [course] cardinality [many]
attribute [level], notkey,
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attribute [department], key,

attribute [course tutor], notkey,
attribute [name], key,

entity [subjects] cardinality [1]
attribute [title], key,

relationship [part of]

entity [Lab.] cardinality [1]
attribute [subject], key,
attribute [duration], notkey, values [1,2,3]

entity [subjects] cardinality [many]
attribute [title], key,

relationship [taught by]

entity [lecturer] cardinality [many]
attribute [title], key,
attribute [speciality], key,
attribute [name], key,
attribute [department], key,

entity [subjects] cardinality [1]
attribute [title], key,

relationship [gives]

entity [Lab.] cardinality [2]
attribute [subject], key,
attribute [duration], notkey, values [1,2,3]

entity [demonstrator] cardinality [many]
attribute [name], key,
attribute [occupation], notkey,
values [technician,research student,lecturer]

relationship [requirement of]

entity [degree] cardinality [many]
attribute [year], key,
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attribute [name], key,
attribute [title], key,
attribute [level], notkey, values [postgraduate,undergraduate]

entity [project] cardinality [1]
attribute [start date], notkey,
attribute [amount], notkey,
attribute [date of submission], notkey,
attribute [type], notkey, values [major,term]
attribute [title], key,
attribute [course], key,

relationship [carry out]

entity [project] cardinality [6]
attribute [start date], notkey,
attribute [amount], notkey,
attribute [date of submission], notkey,
attribute [type], notkey, values [major,term]
attribute [title], key,
attribute [course], key,

entity [student] cardinality [4]
attribute [supervisor], notkey,
attribute [year], notkey,
attribute [name], key,
attribute [course], key,
attribute [Dept.], key,

relationship [examination]

entity [project] cardinality [3]
attribute [start date], notkey,
attribute [amount], notkey,
attribute [date of submission], notkey,
attribute [type], notkey, values [major,term]
attribute [title], key,
attribute [course], key,

entity [lecturer] cardinality [many]
attribute [title], key,
attribute [speciality], key,
attribute [name], key,
attribute [department], key,

relationship [charge]

entity [project] cardinality [2]
attribute [start date], notkey,
attribute [amount], notkey,
attribute [date of submission], notkey,
attribute [type], notkey, values [major,term]
attribute [title], key,
attribute [course], key,

entity [lecturer] cardinality [many]
attribute [title], key,
attribute [speciality], key,
attribute [name], key,
attribute [department], key,

relationship [presents]

entity [speaker] cardinality [many]
attribute [profession], notkey, values [academic,industrialist]
attribute [type], notkey, values [internal,external]

attribute [name], key,
attribute [organization], notkey,

entity [seminar] cardinality [1]
attribute [organizer], notkey,
attribute [location], notkey,
attribute [title], key,
attribute [speciality], notkey,
attribute [chairman], notkey,
attribute [duration], notkey,
attribute [date], notkey,

relationship [attends]

entity [student] cardinality [1]
attribute [supervisor], notkey,
attribute [year], notkey,
attribute [name], key,
attribute [course], key,
attribute [Dept.], key,

entity [graduation] cardinality [many]
attribute [date], key,
attribute [place], key,
attribute [time], notkey,

relationship [gains]

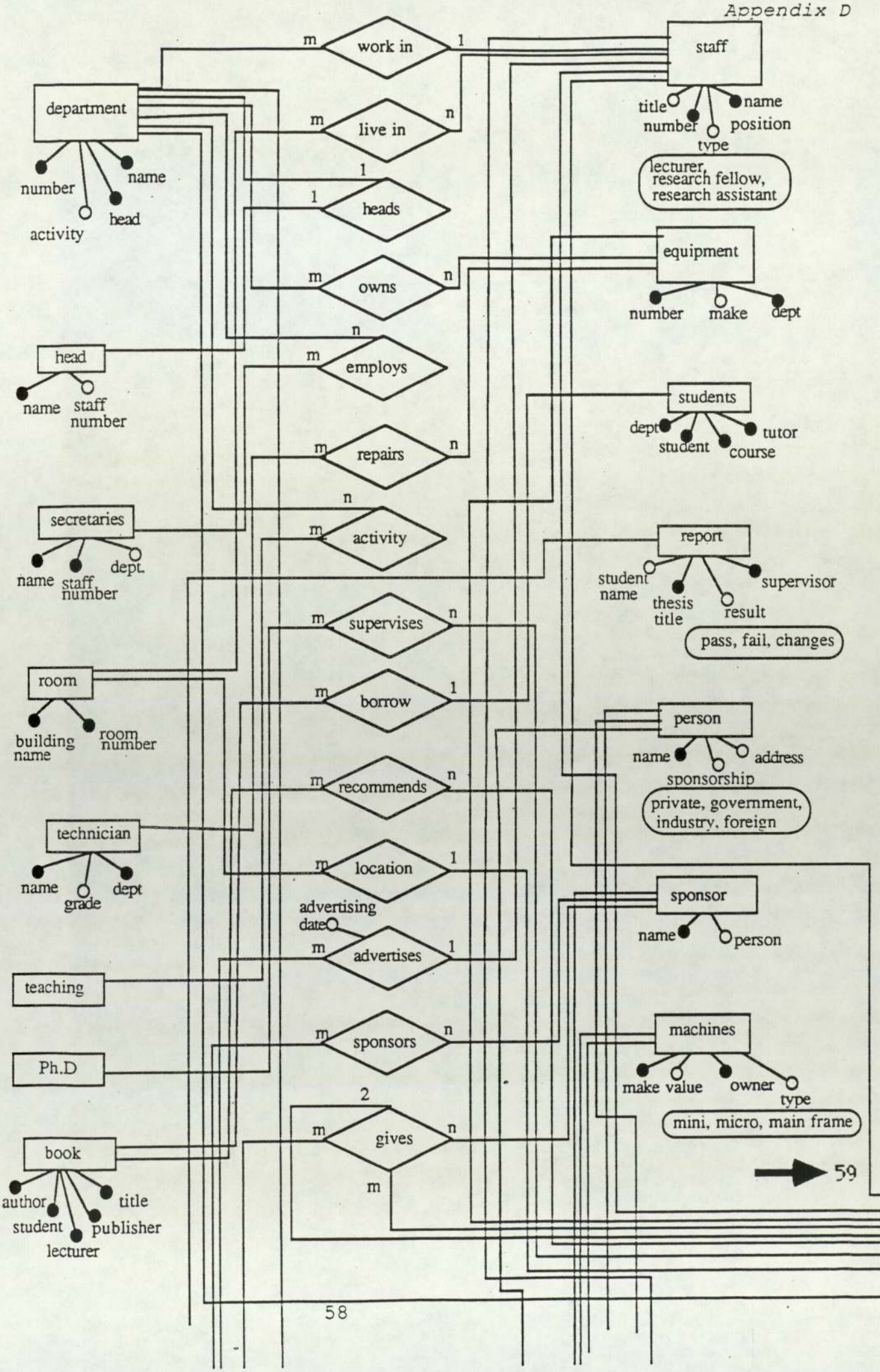
entity [student] cardinality [1]
attribute [supervisor], notkey,
attribute [year], notkey,
attribute [name], key,
attribute [course], key,
attribute [Dept.], key,

entity [degree] cardinality [many]
attribute [year], key,
attribute [type], notkey, values [undergraduate,postgraduate]
attribute [name], key,
attribute [title], key,
attribute [level], notkey, values [postgraduate,undergraduate]

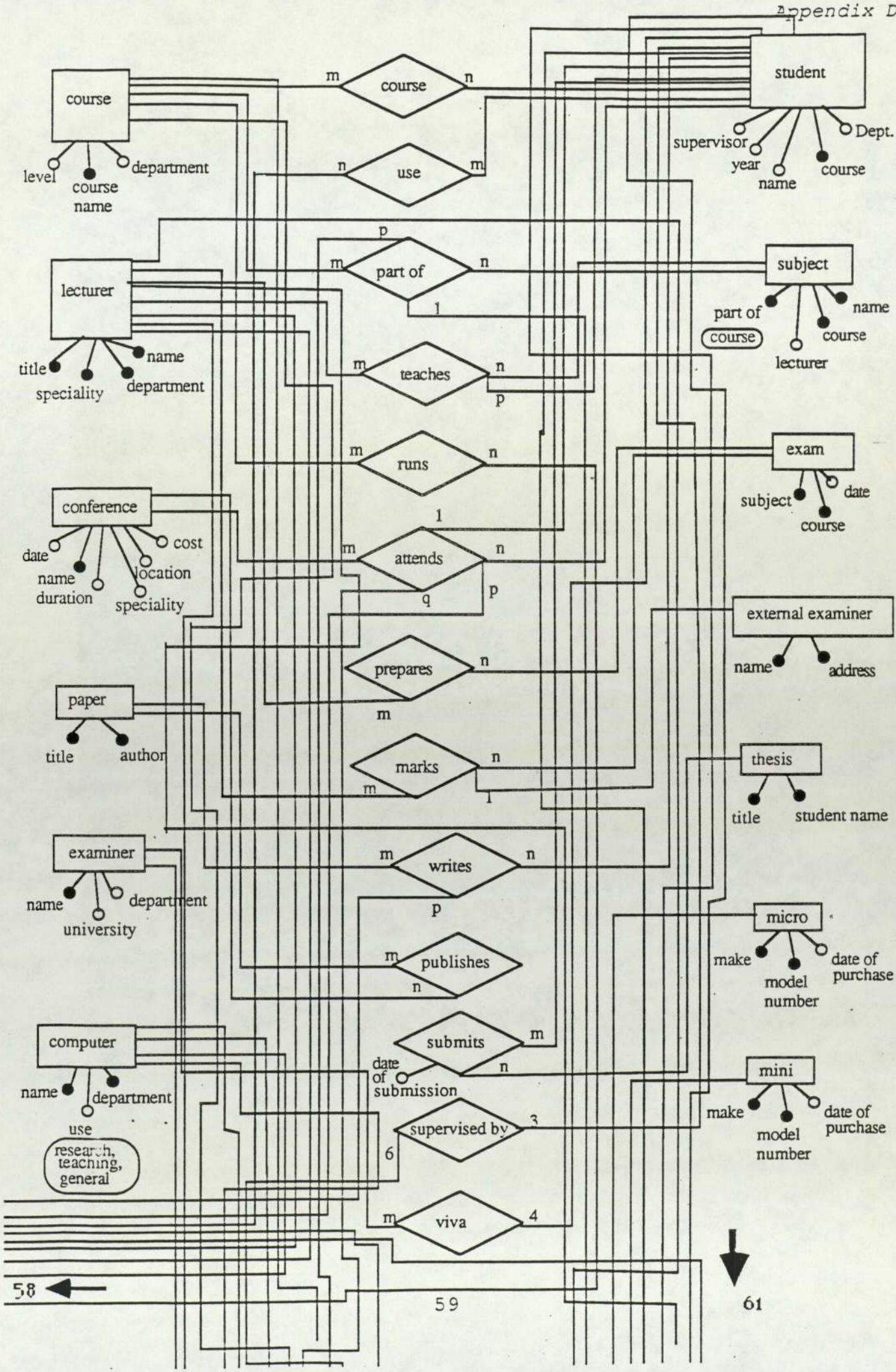
relationship [given at]

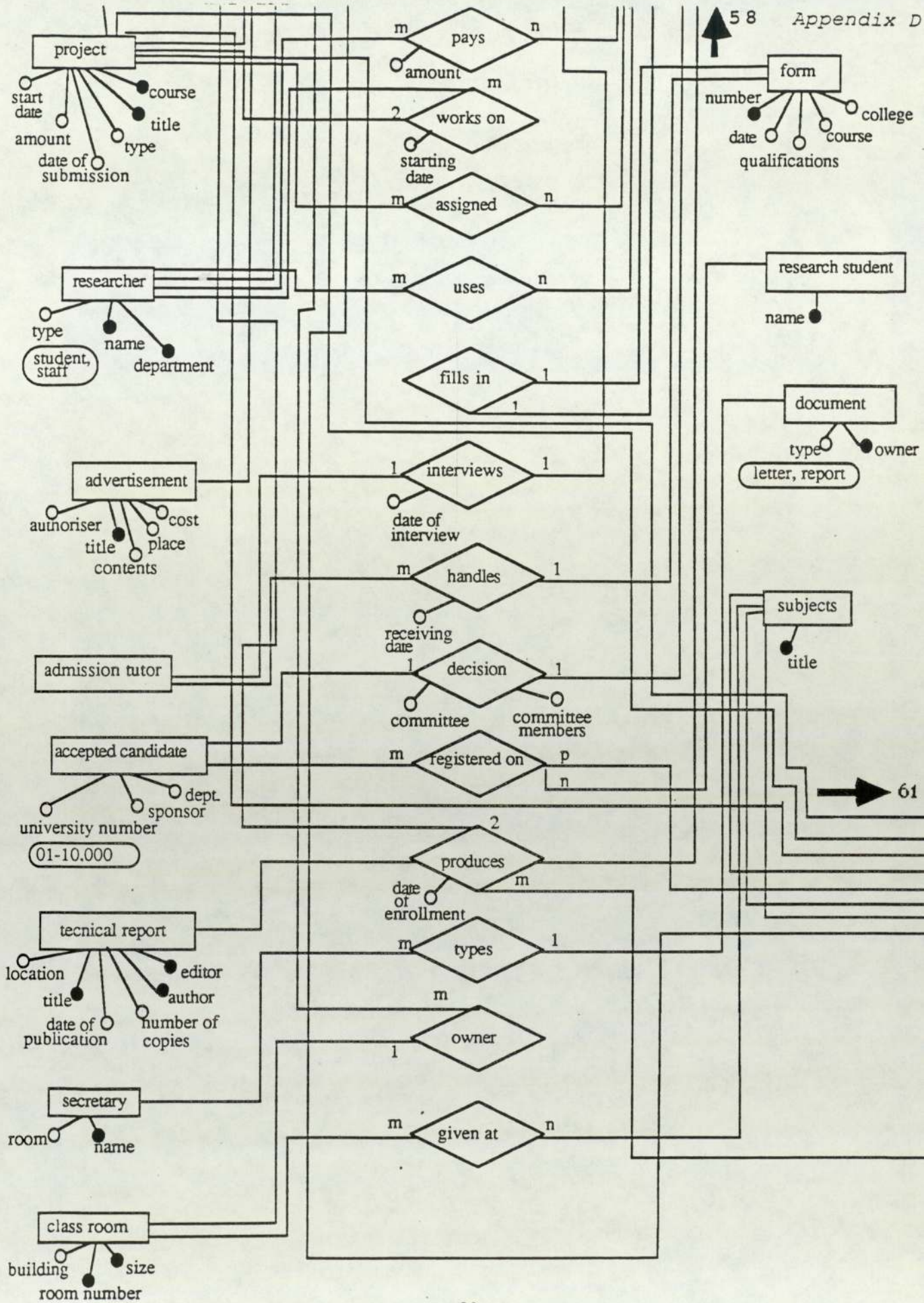
entity [degree] cardinality [many]
attribute [year], key,
attribute [type], notkey, values [undergraduate,postgraduate]
attribute [name], key,
attribute [title], key,
attribute [level], notkey, values [postgraduate,undergraduate]

entity [graduation] cardinality [many]
attribute [date], key,
attribute [place], key,
attribute [time], notkey,


work in
staff
department
live in
title
name
number
position
type
lecturer, research fellow, research assistant
heads
number
name
head
activity
equipment
owns
number
make
dept
head
employs
name
staff number
students
repairs
dept
tutor
student
course
secretaries
activity
report
name
staff number
dept.
student name
supervisor
thesis title
result
pass, fail, changes
supervises
room
borrow
person
building name
room number
name
address
sponsorship
private, government, industry, foreign
recommends
technician
location
sponsor
name
grade
dept
advertising date
person
advertises
teaching
machines
sponsors
make value
owner
type
mini, micro, main frame
Ph.D
gives
book
author
title
student
publisher
lecturer

59


course
level
course name
department
course
use
student
supervisor
year
name
course
Dept.
lecturer
title
speciality
name
department
part of
subject
part of
course
name
course
lecturer
teaches
runs
exam
subject
date
course
conference
date
name
duration
location
speciality
cost
attends
external examiner
name
address
prepares
paper
title
author
marks
thesis
title
student name
examiner
name
university
department
writes
micro
make
model number
date of purchase
publishes
computer
name
department
use
research, teaching, general
submits
date of submission
mini
make
model number
date of purchase
supervised by
viva
58
59
61


project
start date
amount
course
title
type
date of submission
pays
m
n
amount
works on
2
m
starting date
assigned
m
n
form
number
college
date
course
qualifications
researcher
type
name
student, staff
department
uses
m
n
research student
name
fills in
1
1
document
type
owner
letter, report
advertisement
authoriser
title
contents
cost
place
interviews
1
1
date of interview
handles
m
1
receiving date
subjects
title
admission tutor
decision
1
1
committee
committee members
accepted candidate
university number
01-10.000
dept.
sponsor
registered on
m
p
n
61
produces
2
m
date of enrollment
tecnical report
location
title
date of publication
editor
author
number of copies
types
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m
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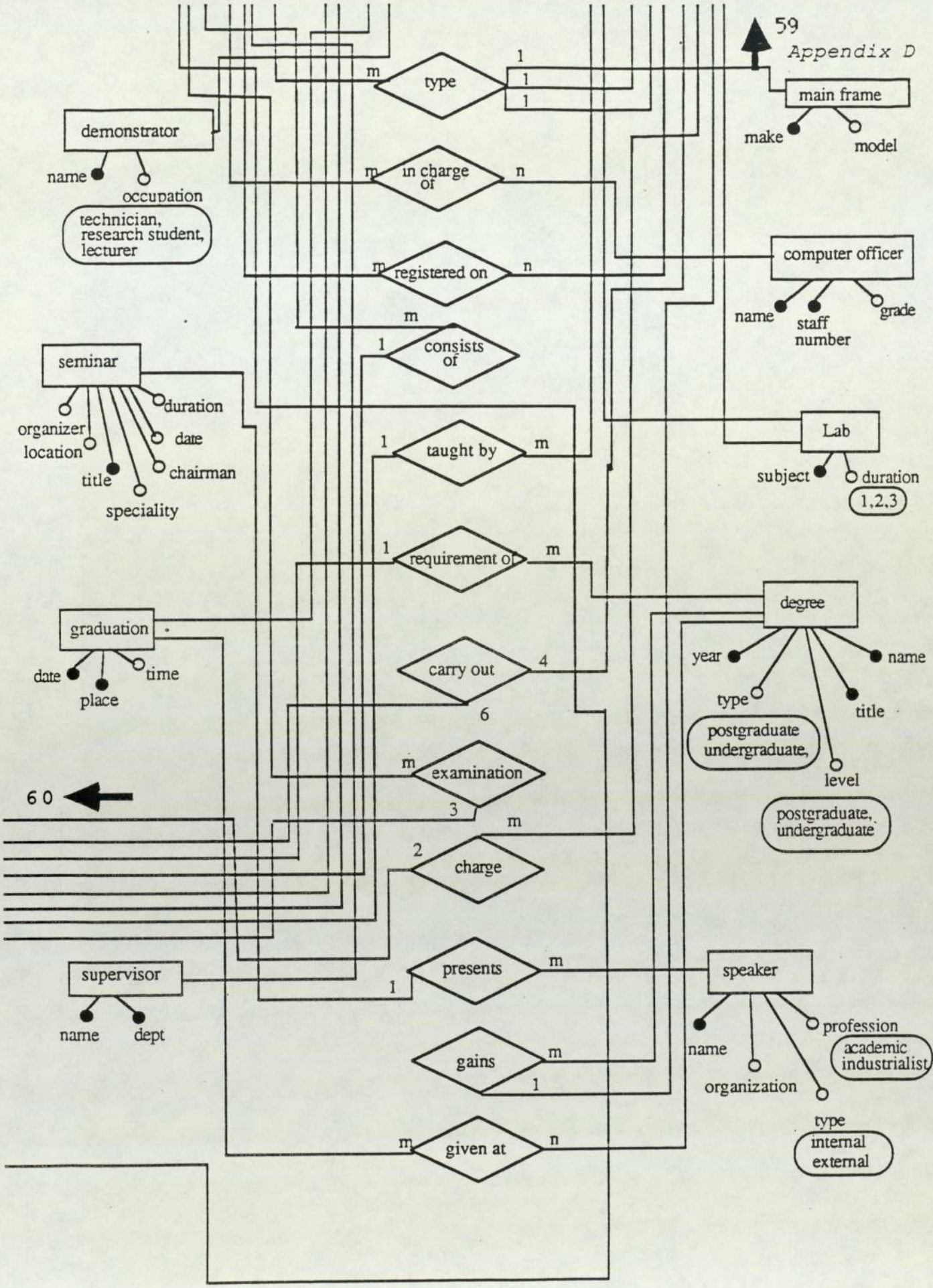
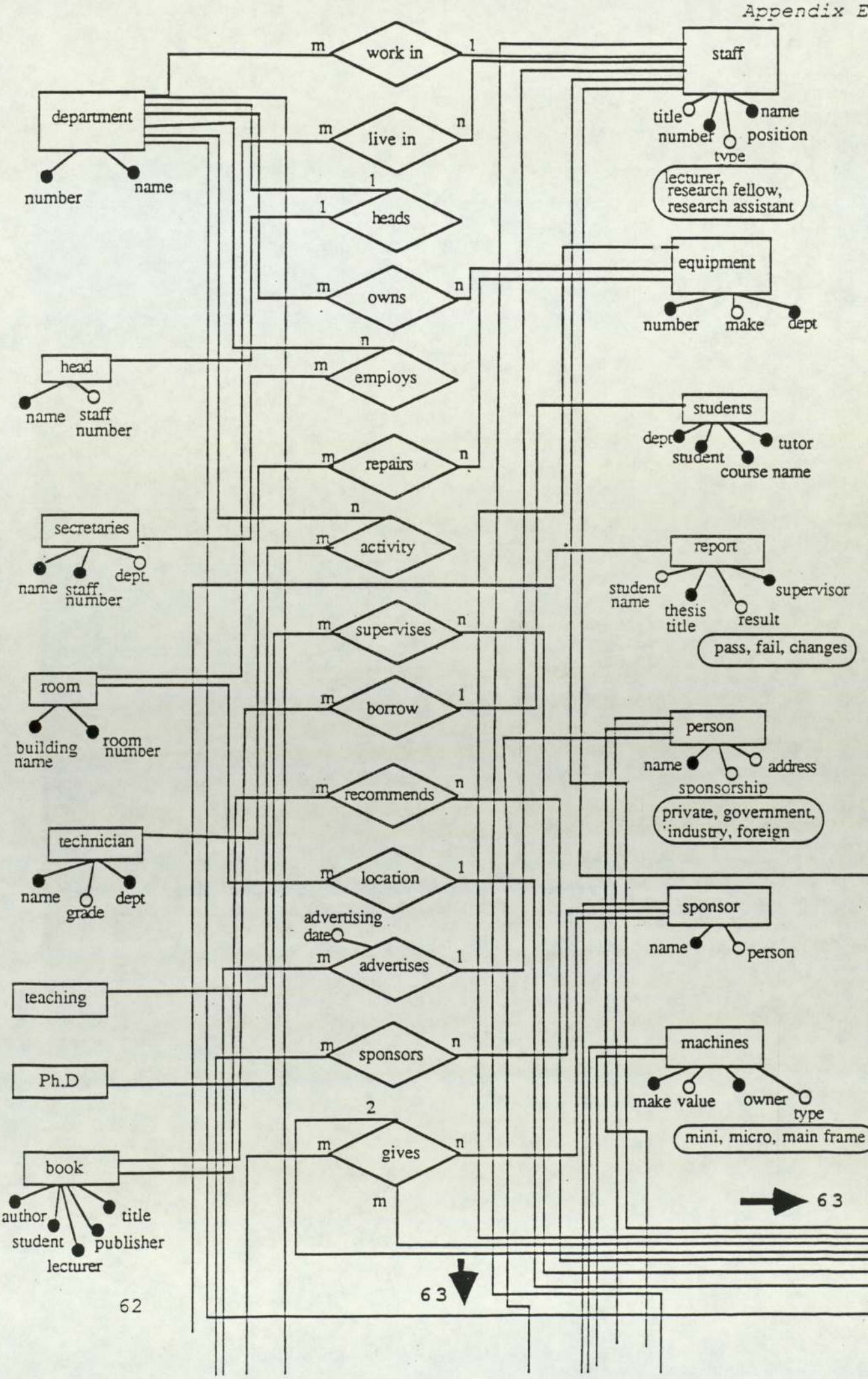
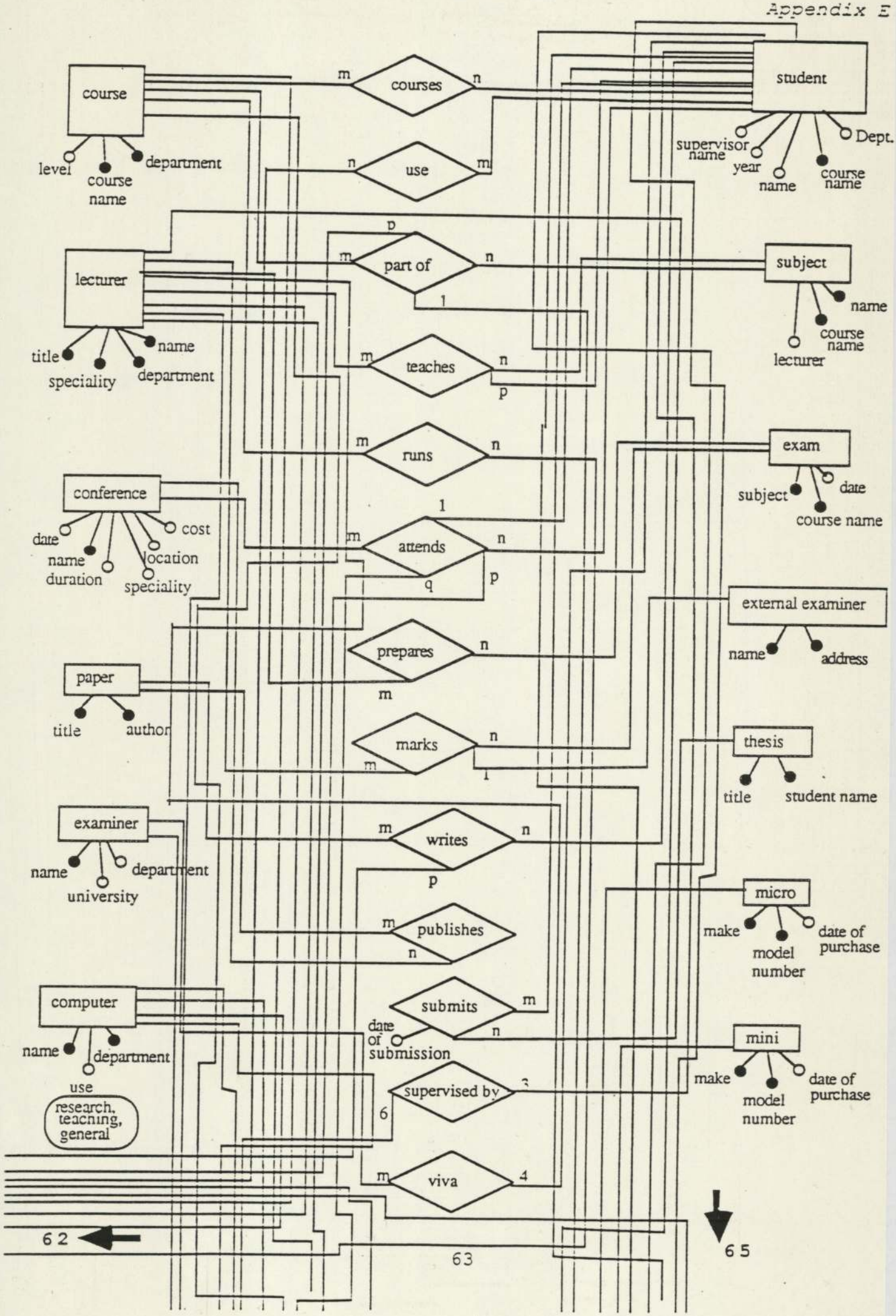
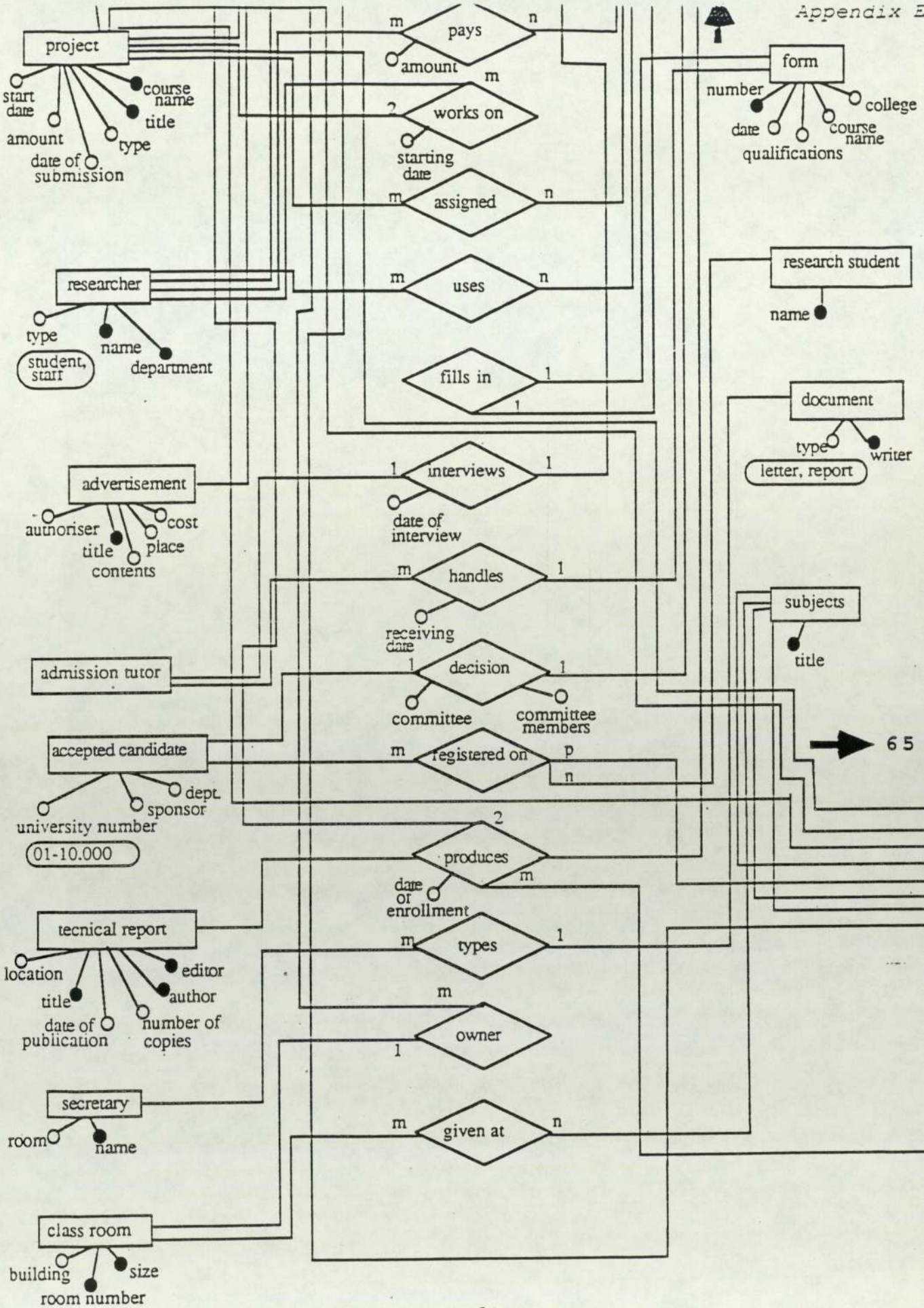
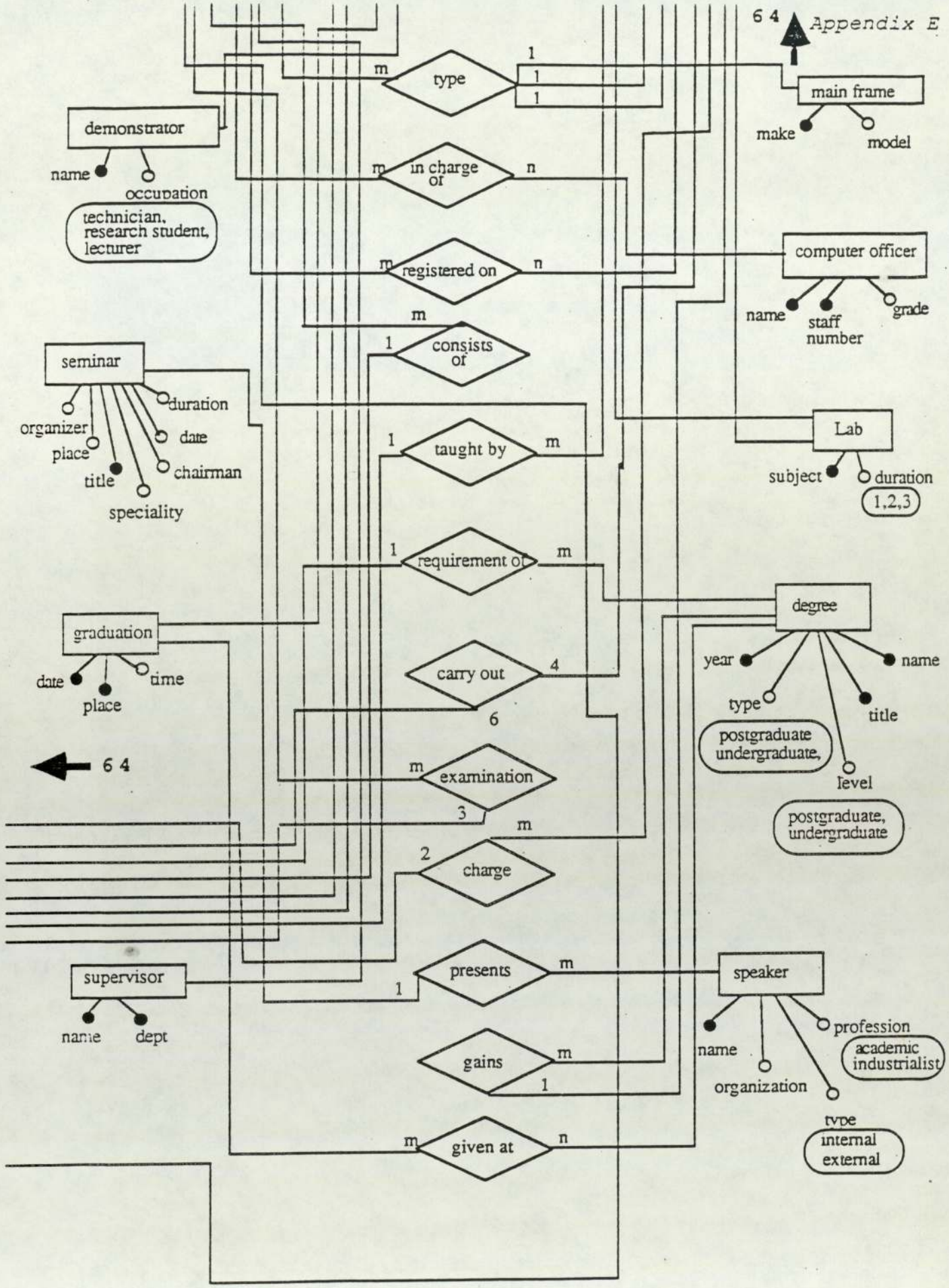
secretary
room
name
given at
m
n
class room
building
room number
size


type
1
1
1
m
main frame
make
model
demonstrator
name
occupation
technician, research student, lecturer
in charge of
m
n
registered on
m
n
computer officer
name
staff number
grade
m
consists of
1
seminar
organizer
location
title
speciality
duration
date
chairman
taught by
1
m
Lab
subject
duration
1,2,3
requirement of
1
m
degree
year
name
type
title
level
postgraduate undergraduate,
postgraduate, undergraduate
graduation
date
time
place
carry out
4
6
examination
m
3
60
m
charge
2
supervisor
name
dept
presents
m
1
speaker
name
organization
profession
academic industrialist
type
internal external
gains
m
1
given at
m
n


work in
staff
department
live in
title
name
number
position
type
lecturer, research fellow, research assistant
heads
equipment
owns
number
make
dept
head
employs
name
staff number
students
dept
tutor
student
course name
repairs
secretaries
activity
report
student name
supervisor
thesis title
result
pass, fail, changes
supervises
room
borrow
building name
room number
person
address
sponsorship
private, government, industry, foreign
recommends
technician
location
sponsor
grade
advertising date
advertises
teaching
sponsors
machines
Ph.D
make
value
owner
type
mini, micro, main frame
gives
book
author
title
student
publisher
lecturer
63
63


course
level
course name
department
m
courses
n
student
supervisor name
year
name
course name
Dept.
n
use
m
lecturer
title
speciality
name
department
p
m
part of
n
1
subject
name
course name
lecturer
m
teaches
n
p
m
runs
n
exam
subject
date
course name
conference
date
name
duration
location
speciality
cost
1
m
attends
n
q
p
external examiner
name
address
prepares
n
m
paper
title
author
marks
n
m
1
thesis
title
student name
examiner
name
university
department
m
writes
n
p
micro
make
model number
date of purchase
m
publishes
n
computer
name
department
use
research, teaching, general
submits
m
n
date of submission
mini
make
model number
date of purchase
supervised by
6
m
viva
4
62
63
65


project
start date
amount
course name
title
type
date of submission
pays
m
n
amount
works on
2
m
starting date
assigned
m
n
form
number
college
date
course name
qualifications
research student
name
researcher
type
student, staff
name
department
uses
m
n
fills in
1
1
document
type
writer
letter, report
advertisement
authoriser
title
contents
cost
place
interviews
1
1
date of interview
handles
m
1
receiving date
subjects
title
admission tutor
decision
1
1
committee
committee members
accepted candidate
university number
01-10.000
dept.
sponsor
registered on
m
p
n
65
produces
2
m
date of enrollment
tecnical report
location
title
date of publication
editor
author
number of copies
types
m
1
owner
m
1
secretary
room
name
given at
m
n
class room
building
room number
size


type
1
1
1
m
main frame
make
model
demonstrator
name
occupation
technician, research student, lecturer
m
in charge of
n
computer officer
m
registered on
n
name
staff number
grade
m
1
consists of
seminar
organizer
place
title
speciality
duration
date
chairman
Lab
subject
duration
1,2,3
1
taught by
m
1
requirement of
m
degree
graduation
date
place
time
carry out
4
6
year
name
type
title
postgraduate undergraduate,
level
postgraduate, undergraduate
64
m
examination
3
m
2
charge
supervisor
name
dept
presents
m
1
speaker
name
organization
profession
academic industrialist
type
internal external
gains
m
1
m
given at
n

```
?- bvim.

Integrating view: adminstration
     integrating entity-relatioship:     department,heads,head
     integrating entity-relatioship:     department,employs,secretaries
     integrating entity-relatioship:     department,work in,staff
     integrating entity-relatioship:     staff,live in,room

Integrating view: teaching
     integrating entity-relatioship:     course,course,student
     integrating entity-relatioship:     lecturer,teaches,subject
     integrating entity-relatioship:     student,use,equipment
     integrating entity-relatioship:     subject,part of,course
     integrating entity-relatioship:     technician,repairs,equipment
     integrating entity-relatioship:     lecturer,teaches,student
     integrating entity-relatioship:     department,runs,course
     integrating entity-relatioship:     department,activity,teaching
     integrating entity-relatioship:     department,owns,equipment
     integrating entity-relatioship:     lecturer,supervises,Ph.D

Integrating view: library
     integrating entity-relatioship:     students,borrow,book
     integrating entity-relatioship:     lecturer,recommends,book

Integrating view: conference
     integrating entity-relatioship:     student,attends,conference
     integrating entity-relatioship:     staff,attends,conference
     integrating entity-relatioship:     student,writes,paper
     integrating entity-relatioship:     staff,writes,paper
     integrating entity-relatioship:     conference,publishes,paper

Integrating view: exams
     integrating entity-relatioship:     lecturer,teaches,subject

closely similar relationships
     View  lecturer teaches subject

     integrating entity-relatioship:     lecturer,prepares,exam
     integrating entity-relatioship:     lecturer,marks,exam
     integrating entity-relatioship:     external examiner,marks,exam

Integrating view: research
     integrating entity-relatioship:     student,submits,thesis
     integrating entity-relatioship:     student,supervised by,supervisor
     integrating entity-relatioship:     student,viva,examiner
     integrating entity-relatioship:     examiner,produces,report

Integrating view: computers
     integrating entity-relatioship:     computer,type,micro
     integrating entity-relatioship:     computer,type,mini
     integrating entity-relatioship:     computer,type,main frame
     integrating entity-relatioship:     computer,in  charge  of,computer
     officer
     integrating entity-relatioship:     computer,registered on,student
     integrating entity-relatioship:     computer,location,room

Integrating view: contract research
```

```
     integrating entity-relatioship:     sponsor,sponsors,project
     integrating entity-relatioship:     sponsor,gives,researcher
     integrating entity-relatioship:     sponsor,pays,researcher
     integrating entity-relatioship:     project,works on,researcher
     integrating entity-relatioship:     project,assigned,machines
     integrating entity-relatioship:     researcher,uses,machines

Integrating view: publicity
     integrating entity-relatioship:     staff,advertises,advertisement

Integrating view: admissions
     integrating entity-relatioship:     person,fills in,form
     integrating entity-relatioship:     person,interviews,admisions tutor
     integrating entity-relatioship:     form,handles,admisions tutor
     integrating entity-relatioship:     person,decision,accepted
     candidate
     integrating entity-relatioship:     accepted  candidate,registered
     on,course
```

CONFLICT between view and schema entity att key status

```
view name is :  admissions
entity name is :  [course]
attribute  with conflict is:  [department]
schema entity has key status :  key
view entity has key status :  notkey

Please do one of the following :
    1.      Enter a new key status
    2.      Type q or query to get information from the views or schema
|: key.
```

```
Integrating view: internal publications
     integrating entity-relatioship:     technical
     report,produces,research student
     integrating entity-relatioship:     technical report,produces,staff


Integrating view: secretarial
     integrating entity-relatioship:     secretary,types,document


Integrating view: time table
     integrating entity-relatioship:     department,owner,class room
     integrating entity-relatioship:     class room,given at,subjects
     integrating entity-relatioship:     course,consists of,subjects
     integrating entity-relatioship:     Lab.,part of,subjects
     integrating entity-relatioship:     lecturer,taught by,subjects
     integrating entity-relatioship:     Lab.,gives,demonstrator


Integrating view: course projects
     integrating entity-relatioship:     degree,requirement of,project
     integrating entity-relatioship:     project,carry out,student
     integrating entity-relatioship:     project,examination,lecturer
```

```
          CONFLICT between view and schema entity att key status

view name is :  course projects
entity name is :  [lecturer]
attribute  with conflict is:  [name]
schema entity has key status :  key
view entity has key status :  notkey

Please do one of the following :
    1.      Enter a new key status
    2.   Type q or query to get information from the views or schema
|: key.
```

```
     integrating entity-relatioship:      project,charge,lecturer

Integrating view: seminars
     integrating entity-relatioship:      speaker,presents,seminar

Integrating view: graduation
     integrating entity-relatioship:      student,attends,graduation
```

```
          CONFLICT between view and schema relationship  ent cards

view name is :  graduation
relationship name is :  [attends]
entity name is :  [student]
schema relationship has ent cards :  [many]
view relationship has ent cards :  [1]

Please do one of the following :
    1.    Enter a new ent cards
    2.   Type q or query to get information from the views or schema
|: [many].
```

```
     integrating entity-relatioship:      student,gains,degree
     integrating entity-relatioship:      degree,given at,graduation


0         identical entity-relationships were found
0         near identical entity-relationships were found
1         closely similar entity-relationships were found
0         similar entity-relationships were found
```

CROSS OBJECT TYPE CONFLICTS ANALYSIS

The attribute activity which belonged to entity department
existed as the relationship activity
and the RELATIONSHIP activity involves the entity department

SOLUTION: The ATTRIBUTE activity was removed from the ENTITY department by the view integrator

---

ATTRIBUTE AS RELATIONSHIP CROSS OBJECT TYPE CONFLICT

The attribute course of entity students
exists as a relationship of the same name as the attribute
AND the relationship course does not involve the entity
students

The solution to such a conflict cannot be taken by VI
Therefore Please choose one of the following :

1. Remove attribute from entity students
2. Change attribute name
3. Change relationship name
4. Leave attribute and relationship names as they are

ENTER your order by typing the appropriate number

|: 2.

Enter the new attribute name: 'course name'.

ATTRIBUTE AS RELATIONSHIP CROSS OBJECT TYPE CONFLICT

The attribute location of entity conference
exists as a relationship of the same name
AND the relationship location does not involve the entity
conference

The solution to such a conflict cannot be taken by VI
Therefore Please choose one of the following :

1. Remove attribute from entity conference
2. Change attribute name
3. Change relationship name
4. Leave attribute and relationship names as they are

ENTER your order by typing the appropriate number
|: 4.

```
ATTRIBUTE AS RELATIONSHIP CROSS OBJECT TYPE CONFLICT

The attribute   course  of entity   subject
exists as a relationship of the same name as the attribute
AND the relationship concerned does not involve the entity
subject   of the attribute concerned

The solution to such a conflict cannot be taken by VIM
Therefore  Please choose one of the following :
      1.  Remove attribute from entity   subject
      2.  Change attribute name
      3.  Change relationship name
      4.  Leave attribute and relationship names as they are
ENTER your order by typing the appropriate number
|: 2.
```

```
Enter the new attribute name:  'course name'.
```

```
ATTRIBUTE AS RELATIONSHIP CROSS OBJECT TYPE CONFLICT

The attribute   course   of entity   exam
exists as a relationship of the same name as the attribute
AND the relationship concerned does not involve the entity
exam   of the attribute concerned

The solution to such a conflict cannot be taken by VIM
Therefore  Please choose one of the following :
      1.  Remove attribute from entity   exam
      2.  Change attribute name
      3.  Change relationship name
      4.  Leave attribute and relationship names as they are
ENTER your order by typing the appropriate number
|: 2.
```

```
Enter the new attribute name:  'course name'.
```

```
ATTRIBUTE AS RELATIONSHIP CROSS OBJECT TYPE CONFLICT

The attribute   course   of entity   form
exists as a relationship of the same name as the attribute
AND the relationship concerned does not involve the entity
form of the attribute concerned

The solution to such a conflict cannot be taken by VIM
Therefore  Please choose one of the following :
      1.  Remove attribute from entity   form
      2.  Change attribute name
      3.  Change relationship name
      4.  Leave attribute and relationship names as they are
ENTER your order by typing the appropriate number
|: 2.
```

```
Enter the new attribute name:  'course name'.
```

```
ATTRIBUTE AS RELATIONSHIP CROSS OBJECT TYPE CONFLICT

The attribute   location   of entity   technical report
exists as a relationship of the same name as the attribute
AND the relationship concerned does not involve the entity
technical report   of the attribute concerned

The solution to such a conflict cannot be taken by VI
Therefore  Please choose one of the following :
      1.  Remove attribute from entity   technical report
      2.  Change attribute name
      3.  Change relationship name
      4.  Leave attribute and relationship names as they are
ENTER your order by typing the appropriate number
|: 4.
```

```
ATTRIBUTE AS RELATIONSHIP CROSS OBJECT TYPE CONFLICT

The attribute   owner   of entity   document
exists as a relationship of the same name as the attribute
AND the relationship concerned does not involve the entity
document   of the attribute concerned

The solution to such a conflict cannot be taken by VI
Therefore  Please choose one of the following :
      1.  Remove attribute from entity   document
      2.  Change attribute name
      3.  Change relationship name
      4.  Leave attribute and relationship names as they are
ENTER your order by typing the appropriate number
|: 2.
```

```
Enter the new attribute name:  writer.
```

```
ATTRIBUTE AS RELATIONSHIP CROSS OBJECT TYPE CONFLICT

The attribute   course   of entity   project
exists as a relationship of the same name as the attribute
AND the relationship concerned does not involve the entity
project   of the attribute concerned

The solution to such a conflict cannot be taken by VI
Therefore  Please choose one of following :
      1.  Remove attribute from entity   project
      2.  Change attribute name
      3.  Change relationship name
      4.  Leave attribute and relationship names as they are
ENTER your order by typing the appropriate number
|: 2.
```

```
Enter the new attribute name:  'course name'.
```

```
ATTRIBUTE AS RELATIONSHIP CROSS OBJECT TYPE CONFLICT

The attribute   location   of entity   seminar
exists as a relationship of the same name as the attribute
AND the relationship concerned does not involve the entity
seminar   of the attribute concerned

The solution to such a conflict cannot be taken by VI
Therefore  Please choose one of following :
      1.  Remove attribute from entity   seminar
      2.  Change attribute name
      3.  Change relationship name
      4.  Leave attribute and relationship names as they are
ENTER your order by typing the appropriate number
|: 2.
```

```
Enter the new attribute name:  place.
```

```
                ATTRIBUTE VALUE AS ENTITY_RELATIONSHIP
The attribute: part of   of entity: subject
has a value: course
and exists an an entity relationship

The value: course   was removed from attribute: part of
Because the attribute   part of   has no other values,
it was removed from entity   subject
```

```
            ENTITY AS  ATTRIBUTE  CROSS OBJECT TYPE CONFLICT
The attribute   department   of entity   course
   exists as the entity   department

BUT:The entity   course   of attribute   department
    is connected to entity   department
    by relationship(s):

CHOOSE any of the following:
    1.  DELETE the attribute   department
    2.  CHANGE the name of the attribute   department
    3.  CHANGE the name of the entity   department
    4.  CHANGE the name of the entity   course
    5.  Accept the situation
    6.  CREATE a relationship between  course   and   department
|:

|: 5.5.
```

```
YOU HAVE MADE THE WRONG CHOICE PLEASE TRY AGAIN
```

```
                    ENTITY ATTRIBUTE CROSS TYPE CONFLICT

The attribute   department   of entity   course
   exists as the entity   department

BUT:The entity   course   of attribute   department
    is connected to entity   department
    by relationship(s):

CHOOSE any of the following:
    1.  DELETE the attribute   department
    2.  CHANGE the name of the attribute   department
    3.  CHANGE the name of the entity   department
    4.  CHANGE the name of the entity   course
    5.  Accept the situation
    6.  CREATE a relationship between  course   and   department
|: 5.
```

```
                    ENTITY ATTRIBUTE CROSS TYPE DEFINITION

The attribute   course   of entity   student
   exists as the entity   course

BUT:The entity   student   of attribute   course
    is NOT connected to entity   course
    by ANY relationship(s):

CHOOSE any of the following:
    1.  DELETE the attribute   course
    2.  CHANGE the name of the attribute   course
    3.  CHANGE the name of the entity   course
    4.  CHANGE the name of the entity   student
    5.  Accept the situation
    6.  CREATE a relationship between  student   and   course
|: 2.
```

```
The name of the attribute you wish to change is   course
of entity   student
Enter the new attribute name to replace the old name:  'course name'.
```

```
                ENTITY ATTRIBUTE CROSS TYPE DEFINITION

The attribute   lecturer   of entity   subject
   exists as the entity   lecturer

BUT:The entity   subject   of attribute   lecturer
    is NOT connected to entity   lecturer
    by ANY relationship(s):

CHOOSE any of the following:
    1.  DELETE the attribute   lecturer
    2.  CHANGE the name of the attribute   lecturer
    3.  CHANGE the name of the entity   lecturer
    4.  CHANGE the name of the entity   subject
    5.      Accept the situation
    6.      CREATE a relationship between  subject   and   lecturer
|: 5.
```

```
                ENTITY ATTRIBUTE CROSS TYPE DEFINITION

The attribute   head   of entity   department
   exists as the entity   head

BUT:The entity   department   of attribute   head
    is connected to entity   head
    by relationship(s):

CHOOSE any of the following:
    1.  DELETE the attribute   head
    2.  CHANGE the name of the attribute   head
    3.  CHANGE the name of the entity   head
    4.  CHANGE the name of the entity   department
    5.  Accept the situation
    6.  CREATE a relationship between  department   and   head
|: 1.
```

```
ENTITY ATTRIBUTE CROSS TYPE DEFINITION

The attribute   supervisor   of entity   student
   exists as the entity   supervisor

BUT:The entity   student   of attribute   supervisor
    is connected to entity   supervisor
    by relationship(s):

CHOOSE any of the following:
    1.  DELETE the attribute   supervisor
    2.  CHANGE the name of the attribute   supervisor
    3.  CHANGE the name of the entity   supervisor
    4.  CHANGE the name of the entity   student
    5.  Accept the situation
    6.  CREATE a relationship between  student   and   supervisor
|: 2.
```

```
The name of the attribute you wish to change is   supervisor
of entity   student
Enter the new attribute name to replace the old name:  'supervisor name'.
```

```
ENTITY RELATIONSHIP CROSS TYPE DEFINITION

The entity   course   exists as the relationship   course
The entity   course   is involved in relationship   course

This could mean any of three things
    1.      The entity is wrongly named
    2.      The relationship is wrongly named

CHOOSE any of the following:

    1.  CHANGE the name of the entity   course
    2.  CHANGE the name of the relationship   course
    3.  Accept the situation
|: 2.
```

```
Enter the new relationship name to replace the old name:  courses.
```

		Wpa=1 Wpk=0 Wpr=0	Wpa=0 Wpk=1 Wpr=0	Wpa=0 Wpk=0 Wpr=1	Wpa=.5 Wpk=0 Wpr=.5	Wpa=.7 Wpk=.1 Wpr=.2	Wpa=.2 Wpk=.1 Wpr=.7
Entity 1	Entity 2	SLF1	SLF2	SLF3	SLF4	SLF5	SLF6
department	head	H:0.25	M:0.33	M:0.14	H:0.19	H:0.24	H:0.18
department	secretaries	M:0.2	M:0.25	M:0.14	H:0.17	M:0.19	H:0.16
department	staff	H:0.33	H:0.669	M:0.079	H:0.2	H:0.31	H:0.19
department	room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
department	course	M:0.14	M:0.2	M:0.089	M:0.11	M:0.14	M:0,11
department	student	M:0.14	L:0.0	L:0.0	M:0.069	M:0.1	L:0.03
department	lecturer	M:0.17	M:0.17	L:0.0	M:0.079	M:0.14	M:0.05
department	subject	M:0.2	M:0.2	L:0.0	M:0.1	M:0.16	M:0.059
department	equipment	M:0.2	M:0.25	M:0.11	H:0.15	M:0.19	H:0.14
department	technician	M:0.2	M:0.25	L:0.0	M:0.1	M:0.16	M:0.059
department	students	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
department	book	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
department	conference	M:0.13	M:0.33	L:0.0	M:0.059	M:0.12	M:0.059
department	paper	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
department	exam	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
department	external examiner	H:0.25	M:0.25	L:0.0	H:0.13	H:0.2	M:0.069
department	thesis	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
department	supervisor	H:0.25	M:0.25	L:0.0	H:0.13	H:0.2	M:0.069
department	examiner	M:0.2	M:0.33	L:0.0	M:0.1	M:0.17	M:0.069
department	report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
department	computer	M:0.2	M:0.25	L:0.0	M:0.1	M:0.16	M:0.059
department	micro	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
department	mini	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
department	main frame	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
department	computer officer	M:0.2	M:0.25	L:0.0	M:0.1	M:0.16	M:0.059
department	sponsor	H:0.25	M:0.33	L:0.0	H:0.13	H:0.21	M:0.079
department	project	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
department	researcher	M:0.2	M:0.25	L:0.0	M:0.1	M:0.16	M:0.059
department	machines	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
department	advertisement	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
department	person	M:0.2	M:0.33	L:0.0	M:0.1	M:0.17	M:0.069
department	form	M:0.14	M:0.33	L:0.0	M:0.069	M:0.13	M:0.059
department	accepted candidate	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
department	technical report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
department	research student	H:0.33	M:0.33	L:0.0	H:0.16	H:0.26	M:0.1
department	secretary	H:0.25	M:0.33	L:0.0	H:0.13	H:0.21	M:0.079
department	document	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
department	class room	L:0.0	L:0.0	M:0.13	M:0.059	L:0.03	M:0.089
department	subjects	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
department	Lab.	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
department	demonstrator	H:0.25	M:0.33	L:0.0	H:0.13	H:0.21	M:0.079
department	degree	M:0.14	M:0.2	L:0.0	M:0.069	M:0.12	M:0.05
department	speaker	M:0.17	M:0.33	L:0.0	M:0.079	M:0.15	M:0.069
department	seminar	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
department	graduation	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
head	department	H:0.25	M:0.33	M:0.14	H:0.19	H:0.24	H:0.18
head	secretaries	H:0.25	H:0.5	L:0.0	H:0.13	H:0.22	M:0.1
head	staff	M:0.17	H:0.5	L:0.0	M:0.079	M:0.17	M:0.079
head	room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
head	course	M:0.17	M:0.33	L:0.0	M:0.079	M:0.15	M:0.069
head	student	M:0.17	L:0.0	L:0.0	M:0.079	M:0.12	L:0.03
head	lecturer	M:0.2	M:0.25	L:0.0	M:0.1	M:0.16	M:0.059
head	subject	H:0.25	M:0.33	L:0.0	H:0.13	H:0.21	M:0.079
head	equipment	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
head	technician	H:0.25	H:0.5	L:0.0	H:0.13	H:0.22	M:0.1

head	students	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
head	book	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
head	conference	M:0.14	H:1.0	L:0.0	M:0.069	H:0.2	H:0.13
head	paper	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
head	exam	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
head	external examiner	H:0.33	H:0.5	L:0.0	H:0.16	H:0.28	M:0.12
head	thesis	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
head	supervisor	H:0.33	H:0.5	L:0.0	H:0.16	H:0.28	M:0.12
head	examiner	H:0.25	H:1.0	L:0.0	H:0.13	H:0.27	H:0.15
head	report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
head	computer	H:0.25	H:0.5	L:0.0	H:0.13	H:0.22	M:0.1
head	micro	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
head	mini	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
head	main frame	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
head	computer officer	H:0.25	H:0.5	L:0.0	H:0.13	H:0.22	M:0.1
head	sponsor	H:0.33	H:1.0	L:0.0	H:0.16	H:0.33	H:0.17
head	project	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
head	researcher	H:0.25	H:0.5	L:0.0	H:0.13	H:0.22	M:0.1
head	machines	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
head	advertisement	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
head	person	H:0.25	H:1.0	L:0.0	H:0.13	H:0.27	H:0.15
head	form	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
head	accepted candidate	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
head	technical report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
head	research student	H:0.5	H:1.0	L:0.0	H:0.25	H:0.45	H:0.2
head	secretary	H:0.33	H:1.0	L:0.0	H:0.16	H:0.33	H:0.17
head	document	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
head	class room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
head	subjects	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
head	Lab.	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
head	demonstrator	H:0.33	H:1.0	L:0.0	H:0.16	H:0.33	H:0.17
head	degree	M:0.17	M:0.33	L:0.0	M:0.079	M:0.15	M:0.069
head	speaker	M:0.2	H:1.0	L:0.0	M:0.1	H:0.24	H:0.14
head	seminar	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
head	graduation	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
secretaries	department	M:0.2	M:0.25	M:0.14	H:0.17	M:0.19	H:0.16
secretaries	head	H:0.25	H:0.5	L:0.0	H:0.13	H:0.22	M:0.1
secretaries	staff	M:0.14	M:0.33	L:0.0	M:0.069	M:0.13	M:0.059
secretaries	room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
secretaries	course	M:0.14	M:0.25	L:0.0	M:0.069	M:0.12	M:0.05
secretaries	student	M:0.14	L:0.0	L:0.0	M:0.069	M:0.1	L:0.03
secretaries	lecturer	M:0.17	M:0.2	L:0.0	M:0.079	M:0.14	M:0.05
secretaries	subject	M:0.2	M:0.25	L:0.0	M:0.1	M:0.16	M:0.059
secretaries	equipment	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
secretaries	technician	M:0.2	M:0.33	L:0.0	M:0.1	M:0.17	M:0.069
secretaries	students	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
secretaries	book	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
secretaries	conference	M:0.13	H:0.5	L:0.0	M:0.059	M:0.14	M:0.079
secretaries	paper	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
secretaries	exam	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
secretaries	external examiner	H:0.25	M:0.33	L:0.0	H:0.13	H:0.21	M:0.079
secretaries	thesis	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
secretaries	supervisor	H:0.25	M:0.33	L:0.0	H:0.13	H:0.21	M:0.079
secretaries	examiner	M:0.2	H:0.5	L:0.0	M:0.1	M:0.19	M:0.089
secretaries	report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
secretaries	computer	M:0.2	M:0.33	L:0.0	M:0.1	M:0.17	M:0.069
secretaries	micro	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
secretaries	mini	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
secretaries	main frame	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
secretaries	computer officer	H:0.5	H:1.0	L:0.0	H:0.25	H:0.45	H:0.2
secretaries	sponsor	H:0.25	H:0.5	L:0.0	H:0.13	H:0.22	M:0.1
secretaries	project	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
secretaries	researcher	M:0.2	M:0.33	L:0.0	M:0.1	M:0.17	M:0.069

secretaries	machines	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
secretaries	advertisement	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
secretaries	person	M:0.2	H:0.5	L:0.0	M:0.1	M:0.19	M:0.089
secretaries	form	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
secretaries	accepted candidate	M:0.2	L:0.0	L:0.0	M:0.1	M:0.14	L:0.04
secretaries	technical report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
secretaries	research student	H:0.33	H:0.5	L:0.0	H:0.16	H:0.28	M:0.12
secretaries	secretary	H:0.25	H:0.5	L:0.0	H:0.13	H:0.22	M:0.1
secretaries	document	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
secretaries	class room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
secretaries	subjects	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
secretaries	Lab.	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
secretaries	demonstrator	H:0.25	H:0.5	L:0.0	H:0.13	H:0.22	M:0.1
secretaries	degree	M:0.14	M:0.25	L:0.0	M:0.069	M:0.12	M:0.05
secretaries	speaker	M:0.17	H:0.5	L:0.0	M:0.079	M:0.17	M:0.079
secretaries	seminar	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
secretaries	graduation	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
staff	department	H:0.33	H:0.669	M:0.079	H:0.2	H:0.31	H:0.19
staff	head	M:0.17	H:0.5	L:0.0	M:0.079	M:0.17	M:0.079
staff	secretaries	M:0.14	M:0.33	L:0.0	M:0.069	M:0.13	M:0.059
staff	room	L:0.0	L:0.0	M:0.14	M:0.069	L:0.03	M:0.1
staff	course	M:0.11	M:0.25	L:0.0	M:0.05	M:0.1	M:0.05
staff	student	M:0.11	L:0.0	M:0.13	M:0.12	M:0.1	M:0.11
staff	lecturer	H:0.29	M:0.2	L:0.0	H:0.14	H:0.22	M:0.079
staff	subject	M:0.14	M:0.25	L:0.0	M:0.069	M:0.12	M:0.05
staff	equipment	M:0.14	M:0.33	L:0.0	M:0.069	M:0.13	M:0.059
staff	technician	M:0.14	M:0.33	L:0.0	M:0.069	M:0.13	M:0.059
staff	students	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
staff	book	M:0.11	L:0.0	L:0.0	M:0.05	M:0.08	L:0.02
staff	conference	M:0.1	H:0.5	M:0.14	M:0.12	M:0.15	H:0.17
staff	paper	M:0.17	L:0.0	M:0.14	H:0.15	M:0.15	H:0.13
staff	exam	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
staff	external examiner	M:0.17	M:0.33	L:0.0	M:0.079	M:0.15	M:0.069
staff	thesis	M:0.17	L:0.0	L:0.0	M:0.079	M:0.12	L:0.03
staff	supervisor	M:0.17	M:0.33	L:0.0	M:0.079	M:0.15	M:0.069
staff	examiner	M:0.14	H:0.5	M:0.14	H:0.14	M:0.18	H:0.18
staff	report	L:0.0	L:0.0	M:0.17	M:0.079	L:0.03	M:0.12
staff	computer	M:0.14	M:0.33	L:0.0	M:0.069	M:0.13	M:0.059
staff	micro	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
staff	mini	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
staff	main frame	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
staff	computer officer	M:0.14	M:0.33	L:0.0	M:0.069	M:0.13	M:0.059
staff	sponsor	M:0.17	H:0.5	L:0.0	M:0.079	M:0.17	M:0.079
staff	project	H:0.22	L:0.0	L:0.0	M:0.11	M:0.15	L:0.04
staff	researcher	H:0.33	M:0.33	L:0.0	H:0.16	H:0.26	M:0.1
staff	machines	M:0.13	L:0.0	L:0.0	M:0.059	M:0.09	L:0.03
staff	advertisement	M:0.11	L:0.0	M:0.17	H:0.14	M:0.11	H:0.14
staff	person	M:0.14	H:0.5	L:0.0	M:0.069	M:0.15	M:0.079
staff	form	M:0.11	H:0.5	L:0.0	M:0.05	M:0.13	M:0.069
staff	accepted candidate	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
staff	technical report	M:0.1	L:0.0	M:0.17	H:0.13	M:0.1	H:0.14
staff	research student	M:0.2	H:0.5	M:0.17	H:0.18	H:0.22	H:0.21
staff	secretary	M:0.17	H:0.5	L:0.0	M:0.079	M:0.17	M:0.079
staff	document	M:0.17	L:0.0	L:0.0	M:0.079	M:0.12	L:0.03
staff	class room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
staff	subjects	M:0.2	L:0.0	L:0.0	M:0.1	M:0.14	L:0.04
staff	Lab.	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
staff	demonstrator	M:0.17	H:0.5	L:0.0	M:0.079	M:0.17	M:0.079
staff	degree	H:0.43	M:0.25	L:0.0	H:0.21	H:0.33	M:0.11
staff	speaker	H:0.29	H:0.5	L:0.0	H:0.14	H:0.25	M:0.11
staff	seminar	M:0.089	L:0.0	L:0.0	L:0.04	L:0.059	L:0.02
staff	graduation	L:0.0	L:0.0	M:0.14	M:0.069	L:0.03	M:0.1
room	department	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0

room	head	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
room	secretaries	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
room	staff	L:0.0	L:0.0	M:0.14	M:0.069	L:0.03	M:0.1
room	course	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
room	student	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
room	lecturer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
room	subject	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
room	equipment	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
room	technician	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
room	students	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
room	book	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
room	conference	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
room	paper	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
room	exam	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
room	external examiner	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
room	thesis	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
room	supervisor	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
room	examiner	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
room	report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
room	computer	L:0.0	L:0.0	M:0.2	M:0.1	L:0.04	H:0.14
room	micro	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
room	mini	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
room	main frame	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
room	computer officer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
room	sponsor	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
room	project	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
room	researcher	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
room	machines	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
room	advertisement	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
room	person	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
room	form	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
room	accepted candidate	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
room	technical report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
room	research student	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
room	secretary	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
room	document	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
room	class room	H:0.25	M:0.33	L:0.0	H:0.13	H:0.21	M:0.079
room	subjects	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
room	Lab.	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
room	demonstrator	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
room	degree	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
room	speaker	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
room	seminar	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
room	graduation	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
course	department	M:0.14	M:0.2	M:0.089	M:0.11	M:0.14	M:0.11
course	head	M:0.17	M:0.33	L:0.0	M:0.079	M:0.15	M:0.069
course	secretaries	M:0.14	M:0.25	L:0.0	M:0.069	M:0.12	M:0.05
course	staff	M:0.11	M:0.25	L:0.0	M:0.05	M:0.1	M:0.05
course	room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
course	student	H:0.25	L:0.0	M:0.14	H:0.19	H:0.2	H:0.15
course	lecturer	H:0.29	M:0.4	L:0.0	H:0.14	H:0.24	M:0.1
course	subject	H:0.33	H:0.5	M:0.17	H:0.25	H:0.31	H:0.23
course	equipment	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
course	technician	M:0.14	M:0.25	L:0.0	M:0.069	M:0.12	M:0.05
course	students	M:0.13	M:0.17	L:0.0	M:0.059	M:0.11	L:0.04
course	book	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
course	conference	M:0.1	M:0.33	L:0.0	M:0.05	M:0.1	M:0.05
course	paper	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
course	exam	M:0.14	M:0.25	L:0.0	M:0.069	M:0.12	M:0.05
course	external examiner	M:0.17	M:0.25	L:0.0	M:0.079	M:0.14	M:0.059
course	thesis	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
course	supervisor	M:0.17	M:0.25	L:0.0	M:0.079	M:0.14	M:0.059
course	examiner	H:0.33	M:0.33	L:0.0	H:0.16	H:0.26	M:0.1

course	report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
course	computer	H:0.33	H:0.669	M:0.13	H:0.23	H:0.32	H:0.22
course	micro	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
course	mini	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
course	main frame	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
course	computer officer	M:0.14	M:0.25	L:0.0	M:0.069	M:0.12	M:0.05
course	sponsor	M:0.17	M:0.33	L:0.0	M:0.079	M:0.15	M:0.069
course	project	M:0.1	M:0.25	L:0.0	M:0.05	M:0.09	L:0.04
course	researcher	H:0.33	H:0.669	L:0.0	H:0.16	H:0.3	H:0.13
course	machines	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
course	advertisement	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
course	person	M:0.14	M:0.33	L:0.0	M:0.069	M:0.13	M:0.059
course	form	M:0.11	L:0.0	L:0.0	M:0.05	M:0.08	L:0.02
course	accepted candidate	L:0.0	L:0.0	M:0.17	M:0.079	L:0.03	M:0.12
course	technical report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
course	research student	M:0.2	M:0.33	L:0.0	M:0.1	M:0.17	M:0.069
course	secretary	M:0.17	M:0.33	L:0.0	M:0.079	M:0.15	M:0.069
course	document	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
course	class room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
course	subjects	L:0.0	L:0.0	H:0.29	H:0.14	L:0.059	H:0.2
course	Lab.	L:0.0	L:0.0	M:0.17	M:0.079	L:0.03	M:0.12
course	demonstrator	M:0.17	M:0.33	L:0.0	M:0.079	M:0.15	M:0.069
course	degree	H:0.25	M:0.2	L:0.0	H:0.13	M:0.19	M:0.069
course	speaker	M:0.13	M:0.33	L:0.0	M:0.059	M:0.12	M:0.059
course	seminar	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
course	graduation	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
student	department	M:0.14	L:0.0	L:0.0	M:0.069	M:0.1	L:0.03
student	head	M:0.17	L:0.0	L:0.0	M:0.079	M:0.12	L:0.03
student	secretaries	M:0.14	L:0.0	L:0.0	M:0.069	M:0.1	L:0.03
student	staff	M:0.11	L:0.0	M:0.13	M:0.12	M:0.1	M:0.11
student	room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
student	course	H:0.25	L:0.0	M:0.14	H:0.19	H:0.2	H:0.15
student	lecturer	M:0.13	L:0.0	M:0.059	M:0.089	M:0.1	M:0.069
student	subject	H:0.33	L:0.0	M:0.079	H:0.2	H:0.25	M:0.12
student	equipment	L:0.0	L:0.0	M:0.079	L:0.04	L:0.02	M:0.059
student	technician	M:0.14	L:0.0	L:0.0	M:0.069	M:0.1	L:0.03
student	students	M:0.13	L:0.0	L:0.0	M:0.059	M:0.09	L:0.03
student	book	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
student	conference	M:0.1	L:0.0	M:0.079	M:0.089	M:0.09	M:0.079
student	paper	L:0.0	L:0.0	M:0.079	L:0.04	L:0.02	M:0.059
student	exam	M:0.14	L:0.0	L:0.0	M:0.069	M:0.1	L:0.03
student	external examiner	M:0.17	L:0.0	L:0.0	M:0.079	M:0.12	L:0.03
student	thesis	L:0.0	L:0.0	M:0.089	L:0.04	L:0.02	M:0.059
student	supervisor	M:0.17	L:0.0	M:0.089	H:0.13	M:0.14	M:0.1
student	examiner	M:0.14	L:0.0	M:0.079	M:0.11	M:0.11	M:0.079
student	report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
student	computer	M:0.14	L:0.0	M:0.069	M:0.1	M:0.11	M:0.079
student	micro	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
student	mini	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
student	main frame	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
student	computer officer	M:0.14	L:0.0	L:0.0	M:0.069	M:0.1	L:0.03
student	sponsor	M:0.17	L:0.0	L:0.0	M:0.079	M:0.12	L:0.03
student	project	M:0.1	L:0.0	M:0.059	M:0.079	M:0.08	M:0.059
student	researcher	M:0.14	L:0.0	L:0.0	M:0.069	M:0.1	L:0.03
student	machines	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
student	advertisement	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
student	person	M:0.14	L:0.0	L:0.0	M:0.069	M:0.1	L:0.03
student	form	M:0.11	L:0.0	L:0.0	M:0.05	M:0.08	L:0.02
student	accepted candidate	L:0.0	L:0.0	M:0.079	L:0.04	L:0.02	M:0.059
student	technical report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
student	research student	M:0.2	L:0.0	L:0.0	M:0.1	M:0.14	L:0.04
student	secretary	M:0.17	L:0.0	L:0.0	M:0.079	M:0.12	L:0.03
student	document	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0

student	class room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
student	subjects	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
student	Lab.	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
student	demonstrator	M:0.17	L:0.0	L:0.0	M:0.079	M:0.12	L:0.03
student	degree	H:0.25	L:0.0	M:0.079	H:0.16	M:0.19	M:0.11
student	speaker	M:0.13	L:0.0	L:0.0	M:0.059	M:0.09	L:0.03
student	seminar	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
student	graduation	L:0.0	L:0.0	M:0.079	L:0.04	L:0.02	M:0.059
lecturer	department	M:0.17	M:0.17	L:0.0	M:0.079	M:0.14	M:0.05
lecturer	head	M:0.2	M:0.25	L:0.0	M:0.1	M:0.16	M:0.059
lecturer	secretaries	M:0.17	M:0.2	L:0.0	M:0.079	M:0.14	M:0.05
lecturer	staff	H:0.29	M:0.2	L:0.0	H:0.14	H:0.22	M:0.079
lecturer	room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
lecturer	course	H:0.29	M:0.4	L:0.0	H:0.14	H:0.24	M:0.1
lecturer	student	M:0.13	L:0.0	M:0.059	M:0.089	M:0.1	M:0.069
lecturer	subject	M:0.17	M:0.17	M:0.11	H:0.14	M:0.16	H:0.13
lecturer	equipment	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
lecturer	technician	M:0.17	M:0.2	L:0.0	M:0.079	M:0.14	M:0.05
lecturer	students	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
lecturer	book	M:0.13	L:0.13	M:0.11	M:0.12	M:0.13	M:0.12
lecturer	conference	H:0.25	M:0.25	L:0.0	H:0.13	H:0.2	M:0.069
lecturer	paper	M:0.2	M:0.2	L:0.0	M:0.1	M:0.16	M:0.059
lecturer	exam	L:0.0	L:0.0	M:0.25	H:0.13	L:0.05	H:0.17
lecturer	external examiner	M:0.2	M:0.2	M:0.13	H:0.16	M:0.19	H:0.15
lecturer	thesis	M:0.2	M:0.2	L:0.0	M:0.1	M:0.16	M:0.059
lecturer	supervisor	M:0.2	M:0.2	L:0.0	M:0.1	M:0.16	M:0.059
lecturer	examiner	H:0.4	M:0.25	L:0.0	H:0.2	H:0.3	M:0.1
lecturer	report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
lecturer	computer	H:0.4	H:0.5	L:0.0	H:0.2	H:0.33	H:0.13
lecturer	micro	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
lecturer	mini	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
lecturer	main frame	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
lecturer	computer officer	M:0.17	M:0.2	L:0.0	M:0.079	M:0.14	M:0.05
lecturer	sponsor	M:0.2	M:0.25	L:0.0	M:0.1	M:0.16	M:0.059
lecturer	project	M:0.11	M:0.2	M:0.15	H:0.13	M:0.13	H:0.15
lecturer	researcher	H:0.4	H:0.5	L:0.0	H:0.2	H:0.33	H:0.13
lecturer	machines	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
lecturer	advertisement	M:0.13	M:0.25	L:0.0	M:0.059	M:0.12	M:0.05
lecturer	person	M:0.17	M:0.25	L:0.0	M:0.079	M:0.14	M:0.059
lecturer	form	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
lecturer	accepted candidate	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
lecturer	technical report	M:0.11	M:0.17	L:0.0	M:0.05	M:0.09	L:0.04
lecturer	research student	H:0.25	M:0.25	L:0.0	H:0.13	H:0.2	M:0.069
lecturer	secretary	M:0.2	M:0.25	L:0.0	M:0.1	M:0.16	M:0.059
lecturer	document	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
lecturer	class room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
lecturer	subjects	H:0.25	M:0.25	M:0.089	H:0.17	H:0.22	H:0.14
lecturer	Lab.	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
lecturer	demonstrator	M:0.2	M:0.25	L:0.0	M:0.1	M:0.16	M:0.059
lecturer	degree	H:0.29	M:0.4	L:0.0	H:0.14	H:0.24	M:0.1
lecturer	speaker	M:0.14	M:0.25	L:0.0	M:0.069	M:0.12	M:0.05
lecturer	seminar	H:0.22	M:0.25	L:0.0	M:0.11	M:0.18	M:0.069
lecturer	graduation	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
subject	department	M:0.2	M:0.2	L:0.0	M:0.1	M:0.16	M:0.059
subject	head	H:0.25	M:0.33	L:0.0	H:0.13	H:0.21	M:0.079
subject	secretaries	M:0.2	M:0.25	L:0.0	M:0.1	M:0.16	M:0.059
subject	staff	M:0.14	M:0.25	L:0.0	M:0.069	M:0.12	M:0.05
subject	room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
subject	course	H:0.33	H:0.5	M:0.17	H:0.25	H:0.31	H:0.23
subject	student	H:0.33	L:0.0	M:0.079	H:0.2	H:0.25	M:0.12
subject	lecturer	M:0.17	M:0.17	M:0.11	H:0.14	M:0.16	H:0.13
subject	equipment	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
subject	technician	M:0.2	M:0.25	L:0.0	M:0.1	M:0.16	M:0.059

subject	students	M:0.17	M:0.17	L:0.0	M:0.079	M:0.14	M:0.05
subject	book	M:0.14	L:0.0	L:0.0	M:0.069	M:0.1	L:0.03
subject	conference	M:0.13	M:0.33	L:0.0	M:0.059	M:0.12	M:0.059
subject	paper	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
subject	exam	M:0.2	M:0.25	L:0.0	M:0.1	M:0.16	M:0.059
subject	external examiner	H:0.25	M:0.25	L:0.0	H:0.13	H:0.2	M:0.069
subject	thesis	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
subject	supervisor	H:0.25	M:0.25	L:0.0	H:0.13	H:0.2	M:0.069
subject	examiner	M:0.2	M:0.33	L:0.0	M:0.1	M:0.17	M:0.069
subject	report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
subject	computer	M:0.2	M:0.25	L:0.0	M:0.1	M:0.16	M:0.059
subject	micro	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
subject	mini	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
subject	main frame	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
subject	computer officer	M:0.2	M:0.25	L:0.0	M:0.1	M:0.16	M:0.059
subject	sponsor	H:0.25	M:0.33	L:0.0	H:0.13	H:0.21	M:0.079
subject	project	M:0.13	M:0.25	L:0.0	M:0.059	M:0.12	M:0.05
subject	researcher	M:0.2	M:0.25	L:0.0	M:0.1	M:0.16	M:0.059
subject	machines	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
subject	advertisement	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
subject	person	M:0.2	M:0.33	L:0.0	M:0.1	M:0.17	M:0.069
subject	form	M:0.14	L:0.0	L:0.0	M:0.069	M:0.1	L:0.03
subject	accepted candidate	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
subject	technical report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
subject	research student	H:0.33	M:0.33	L:0.0	H:0.16	H:0.26	M:0.1
subject	secretary	H:0.25	M:0.33	L:0.0	H:0.13	H:0.21	M:0.079
subject	document	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
subject	class room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
subject	subjects	L:0.0	L:0.0	M:0.2	M:0.1	L:0.04	H:0.14
subject	Lab.	L:0.0	L:0.0	H:0.33	H:0.16	L:0.069	H:0.23
subject	demonstrator	H:0.25	M:0.33	L:0.0	H:0.13	H:0.21	M:0.079
subject	degree	M:0.14	M:0.2	L:0.0	M:0.069	M:0.12	M:0.05
subject	speaker	M:0.17	M:0.33	L:0.0	M:0.079	M:0.15	M:0.069
subject	seminar	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
subject	graduation	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
equipment	department	M:0.2	M:0.25	M:0.11	H:0.15	M:0.19	H:0.14
equipment	head	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
equipment	secretaries	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
equipment	staff	M:0.14	M:0.33	L:0.0	M:0.069	M:0.13	M:0.059
equipment	room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
equipment	course	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
equipment	student	L:0.0	L:0.0	M:0.079	L:0.04	L:0.02	M:0.059
equipment	lecturer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
equipment	subject	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
equipment	technician	M:0.2	M:0.33	H:0.33	H:0.26	H:0.24	H:0.3
equipment	students	M:0.17	M:0.2	L:0.0	M:0.079	M:0.14	M:0.05
equipment	book	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
equipment	conference	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
equipment	paper	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
equipment	exam	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
equipment	external examiner	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
equipment	thesis	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
equipment	supervisor	H:0.25	M:0.33	L:0.0	H:0.13	H:0.21	M:0.079
equipment	examiner	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
equipment	report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
equipment	computer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
equipment	micro	M:0.2	L:0.0	L:0.0	M:0.1	M:0.14	L:0.04
equipment	mini	M:0.2	L:0.0	L:0.0	M:0.1	M:0.14	L:0.04
equipment	main frame	H:0.25	L:0.0	L:0.0	H:0.13	M:0.17	M:0.05
equipment	computer officer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
equipment	sponsor	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
equipment	project	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
equipment	researcher	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0

equipment	machines	M:0.17	L:0.0	L:0.0	M:0.079	M:0.12	L:0.03
equipment	advertisement	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
equipment	person	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
equipment	form	M:0.14	H:0.5	L:0.0	M:0.069	M:0.15	M:0.079
equipment	accepted candidate	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
equipment	technical report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
equipment	research student	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
equipment	secretary	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
equipment	document	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
equipment	class room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
equipment	subjects	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
equipment	Lab.	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
equipment	demonstrator	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
equipment	degree	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
equipment	speaker	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
equipment	seminar	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
equipment	graduation	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
technician	department	M:0.2	M:0.25	L:0.0	M:0.1	M:0.16	M:0.059
technician	head	H:0.25	H:0.5	L:0.0	H:0.13	H:0.22	M:0.1
technician	secretaries	M:0.2	M:0.33	L:0.0	M:0.1	M:0.17	M:0.069
technician	staff	M:0.14	M:0.33	L:0.0	M:0.069	M:0.13	M:0.059
technician	room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
technician	course	M:0.14	M:0.25	L:0.0	M:0.069	M:0.12	M:0.05
technician	student	M:0.14	L:0.0	L:0.0	M:0.069	M:0.1	L:0.03
technician	lecturer	M:0.17	M:0.2	L:0.0	M:0.079	M:0.14	M:0.05
technician	subject	M:0.2	M:0.25	L:0.0	M:0.1	M:0.16	M:0.059
technician	equipment	M:0.2	M:0.33	H:0.33	H:0.26	H:0.24	H:0.3
technician	students	M:0.17	M:0.2	L:0.0	M:0.079	M:0.14	M:0.05
technician	book	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
technician	conference	M:0.13	H:0.5	L:0.0	M:0.059	M:0.14	M:0.079
technician	paper	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
technician	exam	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
technician	external examiner	H:0.25	M:0.33	L:0.0	H:0.13	H:0.21	M:0.079
technician	thesis	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
technician	supervisor	H:0.669	H:1.0	L:0.0	H:0.33	H:0.57	H:0.23
technician	examiner	M:0.2	H:0.5	L:0.0	M:0.1	M:0.19	M:0.089
technician	report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
technician	computer	M:0.2	M:0.33	L:0.0	M:0.1	M:0.17	M:0.069
technician	micro	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
technician	mini	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
technician	main frame	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
technician	computer officer	H:0.5	M:0.33	L:0.0	H:0.25	H:0.38	H:0.13
technician	sponsor	H:0.25	H:0.5	L:0.0	H:0.13	H:0.22	M:0.1
technician	project	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
technician	researcher	M:0.2	M:0.33	L:0.0	M:0.1	M:0.17	M:0.069
technician	machines	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
technician	advertisement	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
technician	person	M:0.2	H:0.5	L:0.0	M:0.1	M:0.19	M:0.089
technician	form	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
technician	accepted candidate	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
technician	technical report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
technician	research student	H:0.33	H:0.5	L:0.0	H:0.16	H:0.28	M:0.12
technician	secretary	H:0.25	H:0.5	L:0.0	H:0.13	H:0.22	M:0.1
technician	document	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
technician	class room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
technician	subjects	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
technician	Lab.	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
technician	demonstrator	H:0.25	H:0.5	L:0.0	H:0.13	H:0.22	M:0.1
technician	degree	M:0.14	M:0.25	L:0.0	M:0.069	M:0.12	M:0.05
technician	speaker	M:0.17	H:0.5	L:0.0	M:0.079	M:0.17	M:0.079
technician	seminar	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
technician	graduation	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
students	department	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0

students	head	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
students	secretaries	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
students	staff	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
students	room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
students	course	M:0.13	M:0.17	L:0.0	M:0.059	M:0.11	L:0.04
students	student	M:0.13	L:0.0	L:0.0	M:0.059	M:0.09	L:0.03
students	lecturer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
students	subject	M:0.17	M:0.17	L:0.0	M:0.079	M:0.14	M:0.05
students	equipment	M:0.17	M:0.2	L:0.0	M:0.079	M:0.14	M:0.05
students	technician	M:0.17	M:0.2	L:0.0	M:0.079	M:0.14	M:0.05
students	book	M:0.13	L:0.13	H:0.5	H:0.31	H:0.2	H:0.39
students	conference	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
students	paper	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
students	exam	M:0.17	M:0.2	L:0.0	M:0.079	M:0.14	M:0.05
students	external examiner	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
students	thesis	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
students	supervisor	M:0.2	M:0.2	L:0.0	M:0.1	M:0.16	M:0.059
students	examiner	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
students	report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
students	computer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
students	micro	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
students	mini	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
students	main frame	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
students	computer officer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
students	sponsor	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
students	project	M:0.11	M:0.2	L:0.0	M:0.05	M:0.1	L:0.04
students	researcher	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
students	machines	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
students	advertisement	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
students	person	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
students	form	M:0.13	L:0.0	L:0.0	M:0.059	M:0.09	L:0.03
students	accepted candidate	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
students	technical report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
students	research student	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
students	secretary	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
students	document	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
students	class room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
students	subjects	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
students	Lab.	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
students	demonstrator	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
students	degree	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
students	speaker	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
students	seminar	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
students	graduation	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
book	department	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
book	head	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
book	secretaries	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
book	staff	M:0.11	L:0.0	L:0.0	M:0.05	M:0.08	L:0.02
book	room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
book	course	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
book	student	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
book	lecturer	M:0.13	L:0.13	M:0.11	M:0.12	M:0.13	M:0.12
book	subject	M:0.14	L:0.0	L:0.0	M:0.069	M:0.1	L:0.03
book	equipment	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
book	technician	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
book	students	M:0.13	L:0.13	H:0.5	H:0.31	H:0.2	H:0.39
book	conference	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
book	paper	H:0.4	M:0.4	L:0.0	H:0.2	H:0.32	M:0.12
book	exam	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
book	external examiner	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
book	thesis	M:0.17	M:0.17	L:0.0	M:0.079	M:0.14	M:0.05
book	supervisor	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
book	examiner	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0

book	report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
book	computer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
book	micro	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
book	mini	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
book	main frame	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
book	computer officer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
book	sponsor	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
book	project	M:0.1	M:0.17	L:0.0	M:0.05	M:0.09	L:0.04
book	researcher	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
book	machines	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
book	advertisement	M:0.11	M:0.2	L:0.0	M:0.05	M:0.1	L:0.04
book	person	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
book	form	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
book	accepted candidate	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
book	technical report	H:0.22	M:0.33	L:0.0	M:0.11	M:0.19	M:0.079
book	research student	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
book	secretary	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
book	document	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
book	class room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
book	subjects	M:0.2	M:0.2	L:0.0	M:0.1	M:0.16	M:0.059
book	Lab.	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
book	demonstrator	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
book	degree	M:0.11	M:0.14	L:0.0	M:0.05	M:0.09	L:0.04
book	speaker	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
book	seminar	M:0.089	M:0.2	L:0.0	L:0.04	M:0.08	L:0.04
book	graduation	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
conference	department	M:0.13	M:0.33	L:0.0	M:0.059	M:0.12	M:0.059
conference	head	M:0.14	H:1.0	L:0.0	M:0.069	H:0.2	H:0.13
conference	secretaries	M:0.13	H:0.5	L:0.0	M:0.059	M:0.14	M:0.079
conference	staff	M:0.1	H:0.5	M:0.14	M:0.12	M:0.15	H:0.17
conference	room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
conference	course	M:0.1	M:0.33	L:0.0	M:0.05	M:0.1	M:0.05
conference	student	M:0.1	L:0.0	M:0.079	M:0.089	M:0.09	M:0.079
conference	lecturer	H:0.25	M:0.25	L:0.0	H:0.13	H:0.2	M:0.069
conference	subject	M:0.13	M:0.33	L:0.0	M:0.059	M:0.12	M:0.059
conference	equipment	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
conference	technician	M:0.13	H:0.5	L:0.0	M:0.059	M:0.14	M:0.079
conference	students	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
conference	book	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
conference	paper	L:0.0	L:0.0	H:0.33	H:0.16	L:0.069	H:0.23
conference	exam	M:0.13	L:0.0	L:0.0	M:0.059	M:0.09	L:0.03
conference	external examiner	M:0.14	H:0.5	L:0.0	M:0.069	M:0.15	M:0.079
conference	thesis	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
conference	supervisor	M:0.14	H:0.5	L:0.0	M:0.069	M:0.15	M:0.079
conference	examiner	M:0.13	H:1.0	L:0.0	M:0.059	M:0.19	H:0.13
conference	report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
conference	computer	M:0.13	H:0.5	L:0.0	M:0.059	M:0.14	M:0.079
conference	micro	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
conference	mini	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
conference	main frame	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
conference	computer officer	M:0.13	H:0.5	L:0.0	M:0.059	M:0.14	M:0.079
conference	sponsor	M:0.14	H:1.0	L:0.0	M:0.069	H:0.2	H:0.13
conference	project	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
conference	researcher	M:0.13	H:0.5	L:0.0	M:0.059	M:0.14	M:0.079
conference	machines	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
conference	advertisement	M:0.1	L:0.0	L:0.0	M:0.05	L:0.069	L:0.02
conference	person	M:0.13	H:1.0	L:0.0	M:0.059	M:0.19	H:0.13
conference	form	M:0.1	L:0.0	L:0.0	M:0.05	L:0.069	L:0.02
conference	accepted candidate	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
conference	technical report	M:0.089	L:0.0	L:0.0	L:0.04	L:0.059	L:0.02
conference	research student	M:0.17	H:1.0	L:0.0	M:0.079	H:0.22	H:0.13
conference	secretary	M:0.14	H:1.0	L:0.0	M:0.069	H:0.2	H:0.13
conference	document	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0

conference	class room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
conference	subjects	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
conference	Lab.	M:0.14	L:0.0	L:0.0	M:0.069	M:0.1	L:0.03
conference	demonstrator	M:0.14	H:1.0	L:0.0	M:0.069	H:0.2	H:0.13
conference	degree	M:0.1	M:0.33	L:0.0	M:0.05	M:0.1	M:0.05
conference	speaker	M:0.11	H:1.0	L:0.0	M:0.05	M:0.18	M:0.12
conference	seminar	H:0.3	L:0.0	L:0.0	H:0.15	H:0.21	M:0.059
conference	graduation	M:0.13	L:0.0	H:0.33	H:0.23	M:0.16	H:0.26
paper	department	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
paper	head	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
paper	secretaries	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
paper	staff	M:0.17	L:0.0	M:0.14	H:0.15	M:0.15	H:0.13
paper	room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
paper	course	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
paper	student	L:0.0	L:0.0	M:0.079	L:0.04	L:0.02	M:0.059
paper	lecturer	M:0.2	M:0.2	L:0.0	M:0.1	M:0.16	M:0.059
paper	subject	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
paper	equipment	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
paper	technician	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
paper	students	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
paper	book	H:0.4	M:0.4	L:0.0	H:0.2	H:0.32	M:0.12
paper	conference	L:0.0	L:0.0	H:0.33	H:0.16	L:0.069	H:0.23
paper	exam	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
paper	external examiner	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
paper	thesis	H:0.33	M:0.33	L:0.0	H:0.16	H:0.26	M:0.1
paper	supervisor	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
paper	examiner	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
paper	report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
paper	computer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
paper	micro	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
paper	mini	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
paper	main frame	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
paper	computer officer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
paper	sponsor	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
paper	project	M:0.14	M:0.33	L:0.0	M:0.069	M:0.13	M:0.059
paper	researcher	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
paper	machines	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
paper	advertisement	M:0.17	H:0.5	L:0.0	M:0.079	M:0.17	M:0.079
paper	person	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
paper	form	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
paper	accepted candidate	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
paper	technical report	H:0.33	H:0.669	L:0.0	H:0.16	H:0.3	H:0.13
paper	research student	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
paper	secretary	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
paper	document	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
paper	class room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
paper	subjects	H:0.5	H:0.5	L:0.0	H:0.25	H:0.4	H:0.15
paper	Lab.	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
paper	demonstrator	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
paper	degree	M:0.17	M:0.25	L:0.0	M:0.079	M:0.14	M:0.059
paper	speaker	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
paper	seminar	M:0.13	H:0.5	L:0.0	M:0.059	M:0.14	M:0.079
paper	graduation	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
exam	department	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
exam	head	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
exam	secretaries	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
exam	staff	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
exam	room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
exam	course	M:0.14	M:0.25	L:0.0	M:0.069	M:0.12	M:0.05
exam	student	M:0.14	L:0.0	L:0.0	M:0.069	M:0.1	L:0.03
exam	lecturer	L:0.0	L:0.0	M:0.25	H:0.13	L:0.05	H:0.17
exam	subject	M:0.2	M:0.25	L:0.0	M:0.1	M:0.16	M:0.059
exam	equipment	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0

exam	technician	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
exam	students	M:0.17	M:0.2	L:0.0	M:0.079	M:0.14	M:0.05
exam	book	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
exam	conference	M:0.13	L:0.0	L:0.0	M:0.059	M:0.09	L:0.03
exam	paper	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
exam	external examiner	L:0.0	L:0.0	H:0.5	H:0.25	M:0.1	H:0.35
exam	thesis	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
exam	supervisor	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
exam	examiner	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
exam	report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
exam	computer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
exam	micro	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
exam	mini	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
exam	main frame	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
exam	computer officer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
exam	sponsor	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
exam	project	M:0.13	M:0.33	L:0.0	M:0.059	M:0.12	M:0.059
exam	researcher	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
exam	machines	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
exam	advertisement	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
exam	person	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
exam	form	H:0.33	L:0.0	L:0.0	H:0.16	H:0.23	M:0.069
exam	accepted candidate	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
exam	technical report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
exam	research student	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
exam	secretary	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
exam	document	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
exam	class room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
exam	subjects	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
exam	Lab.	H:0.25	H:0.5	L:0.0	H:0.13	H:0.22	M:0.1
exam	demonstrator	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
exam	degree	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
exam	speaker	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
exam	seminar	M:0.11	L:0.0	L:0.0	M:0.05	M:0.08	L:0.02
exam	graduation	M:0.2	L:0.0	L:0.0	M:0.1	M:0.14	L:0.04
external examiner	department	H:0.25	M:0.25	L:0.0	H:0.13	H:0.2	M:0.069
external examiner	head	H:0.33	H:0.5	L:0.0	H:0.16	H:0.28	M:0.12
external examiner	secretaries	H:0.25	M:0.33	L:0.0	H:0.13	H:0.21	M:0.079
external examiner	staff	M:0.17	M:0.33	L:0.0	M:0.079	M:0.15	M:0.069
external examiner	room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
external examiner	course	M:0.17	M:0.25	L:0.0	M:0.079	M:0.14	M:0.059
external examiner	student	M:0.17	L:0.0	L:0.0	M:0.079	M:0.12	L:0.03
external examiner	lecturer	M:0.2	M:0.2	M:0.13	H:0.16	M:0.19	H:0.15
external examiner	subject	H:0.25	M:0.25	L:0.0	H:0.13	H:0.2	M:0.069
external examiner	equipment	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
external examiner	technician	H:0.25	M:0.33	L:0.0	H:0.13	H:0.21	M:0.079
external examiner	students	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
external examiner	book	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
external examiner	conference	M:0.14	H:0.5	L:0.0	M:0.069	M:0.15	M:0.079
external examiner	paper	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
external examiner	exam	L:0.0	L:0.0	H:0.5	H:0.25	M:0.1	H:0.35
external examiner	thesis	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
external examiner	supervisor	H:0.33	M:0.33	L:0.0	H:0.16	H:0.26	M:0.1
external examiner	examiner	H:0.25	H:0.5	L:0.0	H:0.13	H:0.22	M:0.1
external examiner	report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
external examiner	computer	H:0.25	M:0.33	L:0.0	H:0.13	H:0.21	M:0.079
external examiner	micro	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
external examiner	mini	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
external examiner	main frame	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
external examiner	computer officer	H:0.25	M:0.33	L:0.0	H:0.13	H:0.21	M:0.079
external examiner	sponsor	H:0.33	H:0.5	L:0.0	H:0.16	H:0.28	M:0.12
external examiner	project	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
external examiner	researcher	H:0.25	M:0.33	L:0.0	H:0.13	H:0.21	M:0.079

external examiner	machines	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
external examiner	advertisement	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
external examiner	person	H:0.669	H:0.5	L:0.0	H:0.33	H:0.52	H:0.18
external examiner	form	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
external examiner	accepted candidate	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
external examiner	technical report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
external examiner	research student	H:0.5	H:0.5	L:0.0	H:0.25	H:0.4	H:0.15
external examiner	secretary	H:0.33	H:0.5	L:0.0	H:0.16	H:0.28	M:0.12
external examiner	document	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
external examiner	class room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
external examiner	subjects	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
external examiner	Lab.	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
external examiner	demonstrator	H:0.33	H:0.5	L:0.0	H:0.16	H:0.28	M:0.12
external examiner	degree	M:0.17	M:0.25	L:0.0	M:0.079	M:0.14	M:0.059
external examiner	speaker	M:0.2	H:0.5	L:0.0	M:0.1	M:0.19	M:0.089
external examiner	seminar	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
external examiner	graduation	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
thesis	department	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
thesis	head	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
thesis	secretaries	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
thesis	staff	M:0.17	L:0.0	L:0.0	M:0.079	M:0.12	L:0.03
thesis	room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
thesis	course	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
thesis	student	L:0.0	L:0.0	M:0.089	L:0.04	L:0.02	M:0.059
thesis	lecturer	M:0.2	M:0.2	L:0.0	M:0.1	M:0.16	M:0.059
thesis	subject	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
thesis	equipment	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
thesis	technician	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
thesis	students	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
thesis	book	M:0.17	M:0.17	L:0.0	M:0.079	M:0.14	M:0.05
thesis	conference	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
thesis	paper	H:0.33	M:0.33	L:0.0	H:0.16	H:0.26	M:0.1
thesis	exam	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
thesis	external examiner	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
thesis	supervisor	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
thesis	examiner	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
thesis	report	M:0.2	L:0.0	L:0.0	M:0.1	M:0.14	L:0.04
thesis	computer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
thesis	micro	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
thesis	mini	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
thesis	main frame	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
thesis	computer officer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
thesis	sponsor	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
thesis	project	M:0.14	M:0.33	L:0.0	M:0.069	M:0.13	M:0.059
thesis	researcher	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
thesis	machines	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
thesis	advertisement	M:0.17	H:0.5	L:0.0	M:0.079	M:0.17	M:0.079
thesis	person	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
thesis	form	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
thesis	accepted candidate	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
thesis	technical report	M:0.14	M:0.25	L:0.0	M:0.069	M:0.12	M:0.05
thesis	research student	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
thesis	secretary	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
thesis	document	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
thesis	class room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
thesis	subjects	H:0.5	H:0.5	L:0.0	H:0.25	H:0.4	H:0.15
thesis	Lab.	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
thesis	demonstrator	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
thesis	degree	M:0.17	M:0.25	L:0.0	M:0.079	M:0.14	M:0.059
thesis	speaker	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
thesis	seminar	M:0.13	H:0.5	L:0.0	M:0.059	M:0.14	M:0.079
thesis	graduation	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
supervisor	department	H:0.25	M:0.25	L:0.0	H:0.13	H:0.2	M:0.069

supervisor	head	H:0.33	H:0.5	L:0.0	H:0.16	H:0.28	M:0.12
supervisor	secretaries	H:0.25	M:0.33	L:0.0	H:0.13	H:0.21	M:0.079
supervisor	staff	M:0.17	M:0.33	L:0.0	M:0.079	M:0.15	M:0.069
supervisor	room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
supervisor	course	M:0.17	M:0.25	L:0.0	M:0.079	M:0.14	M:0.059
supervisor	student	M:0.17	L:0.0	M:0.089	H:0.13	M:0.14	M:0.1
supervisor	lecturer	M:0.2	M:0.2	L:0.0	M:0.1	M:0.16	M:0.059
supervisor	subject	H:0.25	M:0.25	L:0.0	H:0.13	H:0.2	M:0.069
supervisor	equipment	H:0.25	M:0.33	L:0.0	H:0.13	H:0.21	M:0.079
supervisor	technician	H:0.669	H:1.0	L:0.0	H:0.33	H:0.57	H:0.23
supervisor	students	M:0.2	M:0.2	L:0.0	M:0.1	M:0.16	M:0.059
supervisor	book	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
supervisor	conference	M:0.14	H:0.5	L:0.0	M:0.069	M:0.15	M:0.079
supervisor	paper	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
supervisor	exam	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
supervisor	external examiner	H:0.33	M:0.33	L:0.0	H:0.16	H:0.26	M:0.1
supervisor	thesis	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
supervisor	examiner	H:0.25	H:0.5	L:0.0	H:0.13	H:0.22	M:0.1
supervisor	report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
supervisor	computer	H:0.25	M:0.33	L:0.0	H:0.13	H:0.21	M:0.079
supervisor	micro	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
supervisor	mini	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
supervisor	main frame	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
supervisor	computer officer	H:0.25	M:0.33	L:0.0	H:0.13	H:0.21	M:0.079
supervisor	sponsor	H:0.33	H:0.5	L:0.0	H:0.16	H:0.28	M:0.12
supervisor	project	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
supervisor	researcher	H:0.25	M:0.33	L:0.0	H:0.13	H:0.21	M:0.079
supervisor	machines	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
supervisor	advertisement	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
supervisor	person	H:0.25	H:0.5	L:0.0	H:0.13	H:0.22	M:0.1
supervisor	form	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
supervisor	accepted candidate	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
supervisor	technical report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
supervisor	research student	H:0.5	H:0.5	L:0.0	H:0.25	H:0.4	H:0.15
supervisor	secretary	H:0.33	H:0.5	L:0.0	H:0.16	H:0.28	M:0.12
supervisor	document	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
supervisor	class room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
supervisor	subjects	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
supervisor	Lab.	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
supervisor	demonstrator	H:0.33	H:0.5	L:0.0	H:0.16	H:0.28	M:0.12
supervisor	degree	M:0.17	M:0.25	L:0.0	M:0.079	M:0.14	M:0.059
supervisor	speaker	M:0.2	H:0.5	L:0.0	M:0.1	M:0.19	M:0.089
supervisor	seminar	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
supervisor	graduation	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
examiner	department	M:0.2	M:0.33	L:0.0	M:0.1	M:0.17	M:0.069
examiner	head	H:0.25	H:1.0	L:0.0	H:0.13	H:0.27	H:0.15
examiner	secretaries	M:0.2	H:0.5	L:0.0	M:0.1	M:0.19	M:0.089
examiner	staff	M:0.14	H:0.5	M:0.14	H:0.14	M:0.18	H:0.18
examiner	room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
examiner	course	H:0.33	M:0.33	L:0.0	H:0.16	H:0.26	M:0.1
examiner	student	M:0.14	L:0.0	M:0.079	M:0.11	M:0.11	M:0.079
examiner	lecturer	H:0.4	M:0.25	L:0.0	H:0.2	H:0.3	M:0.1
examiner	subject	M:0.2	M:0.33	L:0.0	M:0.1	M:0.17	M:0.069
examiner	equipment	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
examiner	technician	M:0.2	H:0.5	L:0.0	M:0.1	M:0.19	M:0.089
examiner	students	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
examiner	book	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
examiner	conference	M:0.13	H:1.0	L:0.0	M:0.059	M:0.19	H:0.13
examiner	paper	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
examiner	exam	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
examiner	external examiner	H:0.25	H:0.5	L:0.0	H:0.13	H:0.22	M:0.1
examiner	thesis	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
examiner	supervisor	H:0.25	H:0.5	L:0.0	H:0.13	H:0.22	M:0.1

examiner	report	L:0.0	L:0.0	H:0.5	H:0.25	M:0.1	H:0.35
examiner	computer	H:0.5	H:0.5	L:0.0	H:0.25	H:0.4	H:0.15
examiner	micro	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
examiner	mini	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
examiner	main frame	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
examiner	computer officer	M:0.2	H:0.5	L:0.0	M:0.1	M:0.19	M:0.089
examiner	sponsor	H:0.25	H:1.0	L:0.0	H:0.13	H:0.27	H:0.15
examiner	project	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
examiner	researcher	H:0.5	H:0.5	L:0.0	H:0.25	H:0.4	H:0.15
examiner	machines	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
examiner	advertisement	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
examiner	person	M:0.2	H:1.0	L:0.0	M:0.1	H:0.24	H:0.14
examiner	form	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
examiner	accepted candidate	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
examiner	technical report	L:0.0	L:0.0	H:0.5	H:0.25	M:0.1	H:0.35
examiner	research student	H:0.33	H:1.0	H:0.5	H:0.41	H:0.43	H:0.52
examiner	secretary	H:0.25	H:1.0	L:0.0	H:0.13	H:0.27	H:0.15
examiner	document	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
examiner	class room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
examiner	subjects	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
examiner	Lab.	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
examiner	demonstrator	H:0.25	H:1.0	L:0.0	H:0.13	H:0.27	H:0.15
examiner	degree	M:0.14	M:0.33	L:0.0	M:0.069	M:0.13	M:0.059
examiner	speaker	M:0.17	H:1.0	L:0.0	M:0.079	H:0.22	H:0.13
examiner	seminar	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
examiner	graduation	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
report	department	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
report	head	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
report	secretaries	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
report	staff	L:0.0	L:0.0	M:0.17	M:0.079	L:0.03	M:0.12
report	room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
report	course	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
report	student	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
report	lecturer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
report	subject	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
report	equipment	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
report	technician	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
report	students	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
report	book	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
report	conference	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
report	paper	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
report	exam	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
report	external examiner	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
report	thesis	M:0.2	L:0.0	L:0.0	M:0.1	M:0.14	L:0.04
report	supervisor	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
report	examiner	L:0.0	L:0.0	H:0.5	H:0.25	M:0.1	H:0.35
report	computer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
report	micro	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
report	mini	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
report	main frame	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
report	computer officer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
report	sponsor	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
report	project	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
report	researcher	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
report	machines	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
report	advertisement	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
report	person	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
report	form	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
report	accepted candidate	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
report	technical report	L:0.0	L:0.0	H:1.0	H:0.5	H:0.2	H:0.7
report	research student	L:0.0	L:0.0	H:1.0	H:0.5	H:0.2	H:0.7
report	secretary	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
report	document	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0

report	class room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
report	subjects	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
report	Lab.	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
report	demonstrator	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
report	degree	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
report	speaker	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
report	seminar	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
report	graduation	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
computer	department	M:0.2	M:0.25	L:0.0	M:0.1	M:0.16	M:0.059
computer	head	H:0.25	H:0.5	L:0.0	H:0.13	H:0.22	M:0.1
computer	secretaries	M:0.2	M:0.33	L:0.0	M:0.1	M:0.17	M:0.069
computer	staff	M:0.14	M:0.33	L:0.0	M:0.069	M:0.13	M:0.059
computer	room	L:0.0	L:0.0	M:0.2	M:0.1	L:0.04	H:0.14
computer	course	H:0.33	H:0.669	M:0.13	H:0.23	H:0.32	H:0.22
computer	student	M:0.14	L:0.0	M:0.069	M:0.1	M:0.11	M:0.079
computer	lecturer	H:0.4	H:0.5	L:0.0	H:0.2	H:0.33	H:0.13
computer	subject	M:0.2	M:0.25	L:0.0	M:0.1	M:0.16	M:0.059
computer	equipment	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
computer	technician	M:0.2	M:0.33	L:0.0	M:0.1	M:0.17	M:0.069
computer	students	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
computer	book	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
computer	conference	M:0.13	H:0.5	L:0.0	M:0.059	M:0.14	M:0.079
computer	paper	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
computer	exam	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
computer	external examiner	H:0.25	M:0.33	L:0.0	H:0.13	H:0.21	M:0.079
computer	thesis	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
computer	supervisor	H:0.25	M:0.33	L:0.0	H:0.13	H:0.21	M:0.079
computer	examiner	H:0.5	H:0.5	L:0.0	H:0.25	H:0.4	H:0.15
computer	report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
computer	micro	L:0.0	L:0.0	M:0.25	H:0.13	L:0.05	H:0.17
computer	mini	L:0.0	L:0.0	M:0.25	H:0.13	L:0.05	H:0.17
computer	main frame	L:0.0	L:0.0	M:0.25	H:0.13	L:0.05	H:0.17
computer	computer officer	M:0.2	M:0.33	M:0.25	H:0.22	H:0.22	H:0.25
computer	sponsor	H:0.25	H:0.5	L:0.0	H:0.13	H:0.22	M:0.1
computer	project	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
computer	researcher	H:0.5	H:1.0	L:0.0	H:0.25	H:0.45	H:0.2
computer	machines	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
computer	advertisement	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
computer	person	M:0.2	H:0.5	L:0.0	M:0.1	M:0.19	M:0.089
computer	form	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
computer	accepted candidate	L:0.0	L:0.0	M:0.2	M:0.1	L:0.04	H:0.14
computer	technical report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
computer	research student	H:0.33	H:0.5	L:0.0	H:0.16	H:0.28	M:0.12
computer	secretary	H:0.25	H:0.5	L:0.0	H:0.13	H:0.22	M:0.1
computer	document	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
computer	class room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
computer	subjects	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
computer	Lab.	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
computer	demonstrator	H:0.25	H:0.5	L:0.0	H:0.13	H:0.22	M:0.1
computer	degree	M:0.14	M:0.25	L:0.0	M:0.069	M:0.12	M:0.05
computer	speaker	M:0.17	H:0.5	L:0.0	M:0.079	M:0.17	M:0.079
computer	seminar	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
computer	graduation	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
micro	department	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
micro	head	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
micro	secretaries	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
micro	staff	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
micro	room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
micro	course	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
micro	student	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
micro	lecturer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
micro	subject	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
micro	equipment	M:0.2	L:0.0	L:0.0	M:0.1	M:0.14	L:0.04

micro	technician	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
micro	students	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
micro	book	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
micro	conference	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
micro	paper	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
micro	exam	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
micro	external examiner	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
micro	thesis	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
micro	supervisor	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
micro	examiner	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
micro	report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
micro	computer	L:0.0	L:0.0	M:0.25	H:0.13	L:0.05	H:0.17
micro	mini	H:1.0	H:1.0	H:1.0	H:1.0	H:1.0	H:1.0
micro	main frame	H:0.25	H:0.5	H:1.0	H:0.629	H:0.42	H:0.79
micro	computer officer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
micro	sponsor	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
micro	project	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
micro	researcher	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
micro	machines	M:0.17	H:0.5	L:0.0	M:0.079	M:0.17	M:0.079
micro	advertisement	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
micro	person	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
micro	form	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
micro	accepted candidate	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
micro	technical report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
micro	research student	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
micro	secretary	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
micro	document	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
micro	class room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
micro	subjects	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
micro	Lab.	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
micro	demonstrator	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
micro	degree	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
micro	speaker	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
micro	seminar	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
micro	graduation	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
mini	department	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
mini	head	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
mini	secretaries	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
mini	staff	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
mini	room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
mini	course	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
mini	student	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
mini	lecturer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
mini	subject	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
mini	equipment	M:0.2	L:0.0	L:0.0	M:0.1	M:0.14	L:0.04
mini	technician	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
mini	students	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
mini	book	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
mini	conference	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
mini	paper	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
mini	exam	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
mini	external examiner	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
mini	thesis	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
mini	supervisor	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
mini	examiner	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
mini	report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
mini	computer	L:0.0	L:0.0	M:0.25	H:0.13	L:0.05	H:0.17
mini	micro	H:1.0	H:1.0	H:1.0	H:1.0	H:1.0	H:1.0
mini	main frame	H:0.25	H:0.5	H:1.0	H:0.629	H:0.42	H:0.79
mini	computer officer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
mini	sponsor	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
mini	project	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
mini	researcher	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0

mini	machines	M:0.17	H:0.5	L:0.0	M:0.079	M:0.17	M:0.079
mini	advertisement	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
mini	person	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
mini	form	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
mini	accepted candidate	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
mini	technical report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
mini	research student	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
mini	secretary	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
mini	document	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
mini	class room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
mini	subjects	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
mini	Lab.	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
mini	demonstrator	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
mini	degree	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
mini	speaker	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
mini	seminar	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
mini	graduation	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
main frame	department	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
main frame	head	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
main frame	secretaries	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
main frame	staff	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
main frame	room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
main frame	course	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
main frame	student	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
main frame	lecturer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
main frame	subject	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
main frame	equipment	H:0.25	L:0.0	L:0.0	H:0.13	M:0.17	M:0.05
main frame	technician	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
main frame	students	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
main frame	book	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
main frame	conference	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
main frame	paper	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
main frame	exam	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
main frame	external examiner	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
main frame	thesis	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
main frame	supervisor	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
main frame	examiner	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
main frame	report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
main frame	computer	L:0.0	L:0.0	M:0.25	H:0.13	L:0.05	H:0.17
main frame	micro	H:0.25	H:0.5	H:1.0	H:0.629	H:0.42	H:0.79
main frame	mini	H:0.25	H:0.5	H:1.0	H:0.629	H:0.42	H:0.79
main frame	computer officer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
main frame	sponsor	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
main frame	project	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
main frame	researcher	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
main frame	machines	M:0.2	H:1.0	L:0.0	M:0.1	H:0.24	H:0.14
main frame	advertisement	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
main frame	person	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
main frame	form	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
main frame	accepted candidate	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
main frame	technical report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
main frame	research student	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
main frame	secretary	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
main frame	document	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
main frame	class room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
main frame	subjects	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
main frame	Lab.	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
main frame	demonstrator	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
main frame	degree	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
main frame	speaker	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
main frame	seminar	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
main frame	graduation	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
computer officer	department	M:0.2	M:0.25	L:0.0	M:0.1	M:0.16	M:0.059

computer officer	head	H:0.25	H:0.5	L:0.0	H:0.13	H:0.22	M:0.1
computer officer	secretaries	H:0.5	H:1.0	L:0.0	H:0.25	H:0.45	H:0.2
computer officer	staff	M:0.14	M:0.33	L:0.0	M:0.069	M:0.13	M:0.059
computer officer	room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
computer officer	course	M:0.14	M:0.25	L:0.0	M:0.069	M:0.12	M:0.05
computer officer	student	M:0.14	L:0.0	L:0.0	M:0.069	M:0.1	L:0.03
computer officer	lecturer	M:0.17	M:0.2	L:0.0	M:0.079	M:0.14	M:0.05
computer officer	subject	M:0.2	M:0.25	L:0.0	M:0.1	M:0.16	M:0.059
computer officer	equipment	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
computer officer	technician	H:0.5	M:0.33	L:0.0	H:0.25	H:0.38	H:0.13
computer officer	students	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
computer officer	book	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
computer officer	conference	M:0.13	H:0.5	L:0.0	M:0.059	M:0.14	M:0.079
computer officer	paper	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
computer officer	exam	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
computer officer	external examiner	H:0.25	M:0.33	L:0.0	H:0.13	H:0.21	M:0.079
computer officer	thesis	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
computer officer	supervisor	H:0.25	M:0.33	L:0.0	H:0.13	H:0.21	M:0.079
computer officer	examiner	M:0.2	H:0.5	L:0.0	M:0.1	M:0.19	M:0.089
computer officer	report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
computer officer	computer	M:0.2	M:0.33	M:0.25	H:0.22	H:0.22	H:0.25
computer officer	micro	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
computer officer	mini	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
computer officer	main frame	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
computer officer	sponsor	H:0.25	H:0.5	L:0.0	H:0.13	H:0.22	M:0.1
computer officer	project	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
computer officer	researcher	M:0.2	M:0.33	L:0.0	M:0.1	M:0.17	M:0.069
computer officer	machines	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
computer officer	advertisement	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
computer officer	person	M:0.2	H:0.5	L:0.0	M:0.1	M:0.19	M:0.089
computer officer	form	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
computer officer	accepted candidate	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
computer officer	technical report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
computer officer	research student	H:0.33	H:0.5	L:0.0	H:0.16	H:0.28	M:0.12
computer officer	secretary	H:0.25	H:0.5	L:0.0	H:0.13	H:0.22	M:0.1
computer officer	document	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
computer officer	class room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
computer officer	subjects	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
computer officer	Lab.	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
computer officer	demonstrator	H:0.25	H:0.5	L:0.0	H:0.13	H:0.22	M:0.1
computer officer	degree	M:0.14	M:0.25	L:0.0	M:0.069	M:0.12	M:0.05
computer officer	speaker	M:0.17	H:0.5	L:0.0	M:0.079	M:0.17	M:0.079
computer officer	seminar	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
computer officer	graduation	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
sponsor	department	H:0.25	M:0.33	L:0.0	H:0.13	H:0.21	M:0.079
sponsor	head	H:0.33	H:1.0	L:0.0	H:0.16	H:0.33	H:0.17
sponsor	secretaries	H:0.25	H:0.5	L:0.0	H:0.13	H:0.22	M:0.1
sponsor	staff	M:0.17	H:0.5	L:0.0	M:0.079	M:0.17	M:0.079
sponsor	room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
sponsor	course	M:0.17	M:0.33	L:0.0	M:0.079	M:0.15	M:0.069
sponsor	student	M:0.17	L:0.0	L:0.0	M:0.079	M:0.12	L:0.03
sponsor	lecturer	M:0.2	M:0.25	L:0.0	M:0.1	M:0.16	M:0.059
sponsor	subject	H:0.25	M:0.33	L:0.0	H:0.13	H:0.21	M:0.079
sponsor	equipment	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
sponsor	technician	H:0.25	H:0.5	L:0.0	H:0.13	H:0.22	M:0.1
sponsor	students	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
sponsor	book	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
sponsor	conference	M:0.14	H:1.0	L:0.0	M:0.069	H:0.2	H:0.13
sponsor	paper	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
sponsor	exam	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
sponsor	external examiner	H:0.33	H:0.5	L:0.0	H:0.16	H:0.28	M:0.12
sponsor	thesis	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
sponsor	supervisor	H:0.33	H:0.5	L:0.0	H:0.16	H:0.28	M:0.12

sponsor	examiner	H:0.25	H:1.0	L:0.0	H:0.13	H:0.27	H:0.15
sponsor	report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
sponsor	computer	H:0.25	H:0.5	L:0.0	H:0.13	H:0.22	M:0.1
sponsor	micro	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
sponsor	mini	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
sponsor	main frame	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
sponsor	computer officer	H:0.25	H:0.5	L:0.0	H:0.13	H:0.22	M:0.1
sponsor	project	L:0.0	L:0.0	M:0.11	M:0.05	L:0.02	M:0.079
sponsor	researcher	H:0.25	H:0.5	H:0.4	H:0.32	H:0.3	H:0.38
sponsor	machines	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
sponsor	advertisement	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
sponsor	person	H:0.25	H:1.0	L:0.0	H:0.13	H:0.27	H:0.15
sponsor	form	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
sponsor	accepted candidate	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
sponsor	technical report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
sponsor	research student	H:0.5	H:1.0	L:0.0	H:0.25	H:0.45	H:0.2
sponsor	secretary	H:0.33	H:1.0	L:0.0	H:0.16	H:0.33	H:0.17
sponsor	document	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
sponsor	class room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
sponsor	subjects	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
sponsor	Lab.	L:0.0	L:0.0	M:0.25	H:0.13	L:0.05	H:0.17
sponsor	demonstrator	H:0.33	H:1.0	H:0.33	H:0.33	H:0.4	H:0.4
sponsor	degree	M:0.17	M:0.33	L:0.0	M:0.079	M:0.15	M:0.069
sponsor	speaker	M:0.2	H:1.0	L:0.0	M:0.1	H:0.24	H:0.14
sponsor	seminar	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
sponsor	graduation	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
project	department	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
project	head	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
project	secretaries	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
project	staff	H:0.22	L:0.0	L:0.0	M:0.11	M:0.15	L:0.04
project	room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
project	course	M:0.1	M:0.25	L:0.0	M:0.05	M:0.09	L:0.04
project	student	M:0.1	L:0.0	M:0.059	M:0.079	M:0.08	M:0.059
project	lecturer	M:0.11	M:0.2	M:0.15	H:0.13	M:0.13	H:0.15
project	subject	M:0.13	M:0.25	L:0.0	M:0.059	M:0.12	M:0.05
project	equipment	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
project	technician	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
project	students	M:0.11	M:0.2	L:0.0	M:0.05	M:0.1	L:0.04
project	book	M:0.1	M:0.17	L:0.0	M:0.05	M:0.09	L:0.04
project	conference	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
project	paper	M:0.14	M:0.33	L:0.0	M:0.069	M:0.13	M:0.059
project	exam	M:0.13	M:0.33	L:0.0	M:0.059	M:0.12	M:0.059
project	external examiner	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
project	thesis	M:0.14	M:0.33	L:0.0	M:0.069	M:0.13	M:0.059
project	supervisor	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
project	examiner	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
project	report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
project	computer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
project	micro	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
project	mini	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
project	main frame	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
project	computer officer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
project	sponsor	L:0.0	L:0.0	M:0.11	M:0.05	L:0.02	M:0.079
project	researcher	M:0.13	L:0.0	M:0.1	M:0.11	M:0.11	M:0.1
project	machines	M:0.11	L:0.0	M:0.13	M:0.12	M:0.1	M:0.11
project	advertisement	M:0.1	H:0.5	L:0.0	M:0.05	M:0.12	M:0.069
project	person	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
project	form	M:0.1	L:0.0	L:0.0	M:0.05	L:0.069	L:0.02
project	accepted candidate	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
project	technical report	M:0.089	M:0.25	L:0.0	L:0.04	M:0.09	L:0.04
project	research student	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
project	secretary	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
project	document	M:0.14	L:0.0	L:0.0	M:0.069	M:0.1	L:0.03

project	class room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
project	subjects	M:0.17	H:0.5	L:0.0	M:0.079	M:0.17	M:0.079
project	Lab.	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
project	demonstrator	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
project	degree	H:0.22	M:0.25	M:0.11	H:0.16	H:0.2	H:0.15
project	speaker	M:0.11	L:0.0	L:0.0	M:0.05	M:0.08	L:0.02
project	seminar	M:0.079	H:0.5	L:0.0	L:0.04	M:0.11	M:0.069
project	graduation	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
researcher	department	M:0.2	M:0.25	L:0.0	M:0.1	M:0.16	M:0.059
researcher	head	H:0.25	H:0.5	L:0.0	H:0.13	H:0.22	M:0.1
researcher	secretaries	M:0.2	M:0.33	L:0.0	M:0.1	M:0.17	M:0.069
researcher	staff	H:0.33	M:0.33	L:0.0	H:0.16	H:0.26	M:0.1
researcher	room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
researcher	course	H:0.33	H:0.669	L:0.0	H:0.16	H:0.3	H:0.13
researcher	student	M:0.14	L:0.0	L:0.0	M:0.069	M:0.1	L:0.03
researcher	lecturer	H:0.4	H:0.5	L:0.0	H:0.2	H:0.33	H:0.13
researcher	subject	M:0.2	M:0.25	L:0.0	M:0.1	M:0.16	M:0.059
researcher	equipment	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
researcher	technician	M:0.2	M:0.33	L:0.0	M:0.1	M:0.17	M:0.069
researcher	students	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
researcher	book	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
researcher	conference	M:0.13	H:0.5	L:0.0	M:0.059	M:0.14	M:0.079
researcher	paper	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
researcher	exam	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
researcher	external examiner	H:0.25	M:0.33	L:0.0	H:0.13	H:0.21	M:0.079
researcher	thesis	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
researcher	supervisor	H:0.25	M:0.33	L:0.0	H:0.13	H:0.21	M:0.079
researcher	examiner	H:0.5	H:0.5	L:0.0	H:0.25	H:0.4	H:0.15
researcher	report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
researcher	computer	H:0.5	H:1.0	L:0.0	H:0.25	H:0.45	H:0.2
researcher	micro	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
researcher	mini	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
researcher	main frame	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
researcher	computer officer	M:0.2	M:0.33	L:0.0	M:0.1	M:0.17	M:0.069
researcher	sponsor	H:0.25	H:0.5	H:0.4	H:0.32	H:0.3	H:0.38
researcher	project	M:0.13	L:0.0	M:0.1	M:0.11	M:0.11	M:0.1
researcher	machines	M:0.17	L:0.0	M:0.2	H:0.18	M:0.16	H:0.17
researcher	advertisement	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
researcher	person	M:0.2	H:0.5	L:0.0	M:0.1	M:0.19	M:0.089
researcher	form	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
researcher	accepted candidate	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
researcher	technical report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
researcher	research student	H:0.33	H:0.5	L:0.0	H:0.16	H:0.28	M:0.12
researcher	secretary	H:0.25	H:0.5	L:0.0	H:0.13	H:0.22	M:0.1
researcher	document	H:0.25	L:0.0	L:0.0	H:0.13	M:0.17	M:0.05
researcher	class room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
researcher	subjects	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
researcher	Lab.	L:0.0	L:0.0	M:0.2	M:0.1	L:0.04	H:0.14
researcher	demonstrator	H:0.25	H:0.5	M:0.25	H:0.25	H:0.27	H:0.27
researcher	degree	H:0.33	M:0.25	L:0.0	H:0.16	H:0.26	M:0.089
researcher	speaker	H:0.4	H:0.5	L:0.0	H:0.2	H:0.33	H:0.13
researcher	seminar	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
researcher	graduation	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
machines	department	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
machines	head	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
machines	secretaries	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
machines	staff	M:0.13	L:0.0	L:0.0	M:0.059	M:0.09	L:0.03
machines	room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
machines	course	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
machines	student	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
machines	lecturer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
machines	subject	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
machines	equipment	M:0.17	L:0.0	L:0.0	M:0.079	M:0.12	L:0.03

machines	technician	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
machines	students	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
machines	book	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
machines	conference	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
machines	paper	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
machines	exam	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
machines	external examiner	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
machines	thesis	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
machines	supervisor	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
machines	examiner	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
machines	report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
machines	computer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
machines	micro	M:0.17	H:0.5	L:0.0	M:0.079	M:0.17	M:0.079
machines	mini	M:0.17	H:0.5	L:0.0	M:0.079	M:0.17	M:0.079
machines	main frame	M:0.2	H:1.0	L:0.0	M:0.1	H:0.24	H:0.14
machines	computer officer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
machines	sponsor	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
machines	project	M:0.11	L:0.0	M:0.13	M:0.12	M:0.1	M:0.11
machines	researcher	M:0.17	L:0.0	M:0.2	H:0.18	M:0.16	H:0.17
machines	advertisement	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
machines	person	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
machines	form	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
machines	accepted candidate	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
machines	technical report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
machines	research student	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
machines	secretary	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
machines	document	M:0.2	L:0.0	L:0.0	M:0.1	M:0.14	L:0.04
machines	class room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
machines	subjects	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
machines	Lab.	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
machines	demonstrator	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
machines	degree	M:0.13	L:0.0	L:0.0	M:0.059	M:0.09	L:0.03
machines	speaker	M:0.14	L:0.0	L:0.0	M:0.069	M:0.1	L:0.03
machines	seminar	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
machines	graduation	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
advertisement	department	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
advertisement	head	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
advertisement	secretaries	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
advertisement	staff	M:0.11	L:0.0	M:0.17	H:0.14	M:0.11	H:0.14
advertisement	room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
advertisement	course	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
advertisement	student	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
advertisement	lecturer	M:0.13	M:0.25	L:0.0	M:0.059	M:0.12	M:0.05
advertisement	subject	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
advertisement	equipment	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
advertisement	technician	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
advertisement	students	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
advertisement	book	M:0.11	M:0.2	L:0.0	M:0.05	M:0.1	L:0.04
advertisement	conference	M:0.1	L:0.0	L:0.0	M:0.05	L:0.069	L:0.02
advertisement	paper	M:0.17	H:0.5	L:0.0	M:0.079	M:0.17	M:0.079
advertisement	exam	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
advertisement	external examiner	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
advertisement	thesis	M:0.17	H:0.5	L:0.0	M:0.079	M:0.17	M:0.079
advertisement	supervisor	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
advertisement	examiner	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
advertisement	report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
advertisement	computer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
advertisement	micro	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
advertisement	mini	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
advertisement	main frame	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
advertisement	computer officer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
advertisement	sponsor	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
advertisement	project	M:0.1	H:0.5	L:0.0	M:0.05	M:0.12	M:0.069

advertisement	researcher	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
advertisement	machines	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
advertisement	person	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
advertisement	form	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
advertisement	accepted candidate	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
advertisement	technical report	M:0.1	M:0.33	L:0.0	M:0.05	M:0.1	M:0.05
advertisement	research student	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
advertisement	secretary	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
advertisement	document	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
advertisement	class room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
advertisement	subjects	M:0.2	H:1.0	L:0.0	M:0.1	H:0.24	H:0.14
advertisement	Lab.	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
advertisement	demonstrator	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
advertisement	degree	M:0.11	M:0.33	L:0.0	M:0.05	M:0.11	M:0.05
advertisement	speaker	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
advertisement	seminar	M:0.2	H:1.0	L:0.0	M:0.1	H:0.24	H:0.14
advertisement	graduation	M:0.14	L:0.0	L:0.0	M:0.069	M:0.1	L:0.03
person	department	M:0.2	M:0.33	L:0.0	M:0.1	M:0.17	M:0.069
person	head	H:0.25	H:1.0	L:0.0	H:0.13	H:0.27	H:0.15
person	secretaries	M:0.2	H:0.5	L:0.0	M:0.1	M:0.19	M:0.089
person	staff	M:0.14	H:0.5	L:0.0	M:0.069	M:0.15	M:0.079
person	room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
person	course	M:0.14	M:0.33	L:0.0	M:0.069	M:0.13	M:0.059
person	student	M:0.14	L:0.0	L:0.0	M:0.069	M:0.1	L:0.03
person	lecturer	M:0.17	M:0.25	L:0.0	M:0.079	M:0.14	M:0.059
person	subject	M:0.2	M:0.33	L:0.0	M:0.1	M:0.17	M:0.069
person	equipment	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
person	technician	M:0.2	H:0.5	L:0.0	M:0.1	M:0.19	M:0.089
person	students	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
person	book	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
person	conference	M:0.13	H:1.0	L:0.0	M:0.059	M:0.19	H:0.13
person	paper	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
person	exam	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
person	external examiner	H:0.669	H:0.5	L:0.0	H:0.33	H:0.52	H:0.18
person	thesis	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
person	supervisor	H:0.25	H:0.5	L:0.0	H:0.13	H:0.22	M:0.1
person	examiner	M:0.2	H:1.0	L:0.0	M:0.1	H:0.24	H:0.14
person	report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
person	computer	M:0.2	H:0.5	L:0.0	M:0.1	M:0.19	M:0.089
person	micro	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
person	mini	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
person	main frame	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
person	computer officer	M:0.2	H:0.5	L:0.0	M:0.1	M:0.19	M:0.089
person	sponsor	H:0.25	H:1.0	L:0.0	H:0.13	H:0.27	H:0.15
person	project	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
person	researcher	M:0.2	H:0.5	L:0.0	M:0.1	M:0.19	M:0.089
person	machines	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
person	advertisement	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
person	form	L:0.0	L:0.0	M:0.25	H:0.13	L:0.05	H:0.17
person	accepted candidate	L:0.0	L:0.0	M:0.25	H:0.13	L:0.05	H:0.17
person	technical report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
person	research student	H:0.33	H:1.0	L:0.0	H:0.16	H:0.33	H:0.17
person	secretary	H:0.25	H:1.0	L:0.0	H:0.13	H:0.27	H:0.15
person	document	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
person	class room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
person	subjects	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
person	Lab.	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
person	demonstrator	H:0.25	H:1.0	L:0.0	H:0.13	H:0.27	H:0.15
person	degree	M:0.14	M:0.33	L:0.0	M:0.069	M:0.13	M:0.059
person	speaker	M:0.17	H:1.0	L:0.0	M:0.079	H:0.22	H:0.13
person	seminar	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
person	graduation	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
form	department	M:0.14	M:0.33	L:0.0	M:0.069	M:0.13	M:0.059

form	head	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
form	secretaries	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
form	staff	M:0.11	H:0.5	L:0.0	M:0.05	M:0.13	M:0.069
form	room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
form	course	M:0.11	L:0.0	L:0.0	M:0.05	M:0.08	L:0.02
form	student	M:0.11	L:0.0	L:0.0	M:0.05	M:0.079	L:0.02
form	lecturer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
form	subject	M:0.14	L:0.0	L:0.0	M:0.069	M:0.1	L:0.03
form	equipment	M:0.14	H:0.5	L:0.0	M:0.069	M:0.15	M:0.079
form	technician	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
form	students	M:0.13	L:0.0	L:0.0	M:0.059	M:0.09	L:0.03
form	book	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
form	conference	M:0.1	L:0.0	L:0.0	M:0.05	L:0.069	L:0.02
form	paper	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
form	exam	H:0.33	L:0.0	L:0.0	H:0.16	H:0.23	M:0.069
form	external examiner	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
form	thesis	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
form	supervisor	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
form	examiner	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
form	report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
form	computer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
form	micro	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
form	mini	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
form	main frame	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
form	computer officer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
form	sponsor	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
form	project	M:0.1	L:0.0	L:0.0	M:0.05	L:0.069	L:0.02
form	researcher	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
form	machines	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
form	advertisement	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
form	person	L:0.0	L:0.0	M:0.25	H:0.13	L:0.05	H:0.17
form	accepted candidate	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
form	technical report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
form	research student	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
form	secretary	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
form	document	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
form	class room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
form	subjects	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
form	Lab.	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
form	demonstrator	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
form	degree	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
form	speaker	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
form	seminar	M:0.089	L:0.0	L:0.0	L:0.04	L:0.059	L:0.02
form	graduation	M:0.14	L:0.0	L:0.0	M:0.069	M:0.1	L:0.03
accepted candidate	department	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
accepted candidate	head	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
accepted candidate	secretaries	M:0.2	L:0.0	L:0.0	M:0.1	M:0.14	L:0.04
accepted candidate	staff	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
accepted candidate	room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
accepted candidate	course	L:0.0	L:0.0	M:0.17	M:0.079	L:0.03	M:0.12
accepted candidate	student	L:0.0	L:0.0	M:0.079	L:0.04	L:0.02	M:0.059
accepted candidate	lecturer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
accepted candidate	subject	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
accepted candidate	equipment	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
accepted candidate	technician	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
accepted candidate	students	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
accepted candidate	book	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
accepted candidate	conference	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
accepted candidate	paper	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
accepted candidate	exam	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
accepted candidate	external examiner	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
accepted candidate	thesis	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0

accepted candidate	supervisor	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
accepted candidate	examiner	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
accepted candidate	report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
accepted candidate	computer	L:0.0	L:0.0	M:0.2	M:0.1	L:0.04	H:0.14
accepted candidate	micro	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
accepted candidate	mini	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
accepted candidate	main frame	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
accepted candidate	computer officer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
accepted candidate	sponsor	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
accepted candidate	project	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
accepted candidate	researcher	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
accepted candidate	machines	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
accepted candidate	advertisement	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
accepted candidate	person	L:0.0	L:0.0	M:0.25	H:0.13	L:0.05	H:0.17
accepted candidate	form	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
accepted candidate	technical report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
accepted candidate	research student	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
accepted candidate	secretary	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
accepted candidate	document	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
accepted candidate	class room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
accepted candidate	subjects	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
accepted candidate	Lab.	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
accepted candidate	demonstrator	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
accepted candidate	degree	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
accepted candidate	speaker	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
accepted candidate	seminar	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
accepted candidate	graduation	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
technical report	department	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
technical report	head	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
technical report	secretaries	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
technical report	staff	M:0.1	L:0.0	M:0.17	H:0.13	M:0.1	H:0.14
technical report	room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
technical report	course	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
technical report	student	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
technical report	lecturer	M:0.11	M:0.17	L:0.0	M:0.05	M:0.09	L:0.04
technical report	subject	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
technical report	equipment	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
technical report	technician	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
technical report	students	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
technical report	book	H:0.22	M:0.33	L:0.0	M:0.11	M:0.19	M:0.079
technical report	conference	M:0.089	L:0.0	L:0.0	L:0.04	L:0.059	L:0.02
technical report	paper	H:0.33	H:0.669	L:0.0	H:0.16	H:0.3	H:0.13
technical report	exam	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
technical report	external examiner	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
technical report	thesis	M:0.14	M:0.25	L:0.0	M:0.069	M:0.12	M:0.05
technical report	supervisor	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
technical report	examiner	L:0.0	L:0.0	H:0.5	H:0.25	M:0.1	H:0.35
technical report	report	L:0.0	L:0.0	H:1.0	H:0.5	H:0.2	H:0.7
technical report	computer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
technical report	micro	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
technical report	mini	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
technical report	main frame	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
technical report	computer officer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
technical report	sponsor	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
technical report	project	M:0.089	M:0.25	L:0.0	L:0.04	M:0.09	L:0.04
technical report	researcher	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
technical report	machines	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
technical report	advertisement	M:0.1	M:0.33	L:0.0	M:0.05	M:0.1	M:0.05
technical report	person	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
technical report	form	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
technical report	accepted candidate	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
technical report	research student	L:0.0	L:0.0	H:1.0	H:0.5	H:0.2	H:0.7
technical report	secretary	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0

technical report	document	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
technical report	class room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
technical report	subjects	M:0.17	M:0.33	L:0.0	M:0.079	M:0.15	M:0.069
technical report	Lab.	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
technical report	demonstrator	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
technical report	degree	M:0.1	M:0.2	L:0.0	M:0.05	M:0.09	L:0.04
technical report	speaker	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
technical report	seminar	M:0.079	M:0.33	L:0.0	L:0.04	M:0.09	M:0.05
technical report	graduation	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
research student	department	H:0.33	M:0.33	L:0.0	H:0.16	H:0.26	M:0.1
research student	head	H:0.5	H:1.0	L:0.0	H:0.25	H:0.45	H:0.2
research student	secretaries	H:0.33	H:0.5	L:0.0	H:0.16	H:0.28	M:0.12
research student	staff	M:0.2	H:0.5	M:0.17	H:0.18	H:0.22	H:0.21
research student	room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
research student	course	M:0.2	M:0.33	L:0.0	M:0.1	M:0.17	M:0.069
research student	student	M:0.2	L:0.0	L:0.0	M:0.1	M:0.14	L:0.04
research student	lecturer	H:0.25	M:0.25	L:0.0	H:0.13	H:0.2	M:0.069
research student	subject	H:0.33	M:0.33	L:0.0	H:0.16	H:0.26	M:0.1
research student	equipment	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
research student	technician	H:0.33	H:0.5	L:0.0	H:0.16	H:0.28	M:0.12
research student	students	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
research student	book	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
research student	conference	M:0.17	H:1.0	L:0.0	M:0.079	H:0.22	H:0.13
research student	paper	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
research student	exam	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
research student	external examiner	H:0.5	H:0.5	L:0.0	H:0.25	H:0.4	H:0.15
research student	thesis	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
research student	supervisor	H:0.5	H:0.5	L:0.0	H:0.25	H:0.4	H:0.15
research student	examiner	H:0.33	H:1.0	H:0.5	H:0.41	H:0.43	H:0.52
research student	report	L:0.0	L:0.0	H:1.0	H:0.5	H:0.2	H:0.7
research student	computer	H:0.33	H:0.5	L:0.0	H:0.16	H:0.28	M:0.12
research student	micro	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
research student	mini	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
research student	main frame	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
research student	computer officer	H:0.33	H:0.5	L:0.0	H:0.16	H:0.28	M:0.12
research student	sponsor	H:0.5	H:1.0	L:0.0	H:0.25	H:0.45	H:0.2
research student	project	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
research student	researcher	H:0.33	H:0.5	L:0.0	H:0.16	H:0.28	M:0.12
research student	machines	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
research student	advertisement	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
research student	person	H:0.33	H:1.0	L:0.0	H:0.16	H:0.33	H:0.17
research student	form	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
research student	accepted candidate	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
research student	technical report	L:0.0	L:0.0	H:1.0	H:0.5	H:0.2	H:0.7
research student	secretary	H:0.5	H:1.0	L:0.0	H:0.25	H:0.45	H:0.2
research student	document	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
research student	class room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
research student	subjects	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
research student	Lab.	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
research student	demonstrator	H:0.5	H:1.0	L:0.0	H:0.25	H:0.45	H:0.2
research student	degree	M:0.2	M:0.33	L:0.0	M:0.1	M:0.17	M:0.069
research student	speaker	H:0.25	H:1.0	L:0.0	H:0.13	H:0.27	H:0.15
research student	seminar	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
research student	graduation	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
secretary	department	H:0.25	M:0.33	L:0.0	H:0.13	H:0.21	M:0.079
secretary	head	H:0.33	H:1.0	L:0.0	H:0.16	H:0.33	H:0.17
secretary	secretaries	H:0.25	H:0.5	L:0.0	H:0.13	H:0.22	M:0.1
secretary	staff	M:0.17	H:0.5	L:0.0	M:0.079	M:0.17	M:0.079
secretary	room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
secretary	course	M:0.17	M:0.33	L:0.0	M:0.079	M:0.15	M:0.069
secretary	student	M:0.17	L:0.0	L:0.0	M:0.079	M:0.12	L:0.03
secretary	lecturer	M:0.2	M:0.25	L:0.0	M:0.1	M:0.16	M:0.059
secretary	subject	H:0.25	M:0.33	L:0.0	H:0.13	H:0.21	M:0.079

secretary	equipment	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
secretary	technician	H:0.25	H:0.5	L:0.0	H:0.13	H:0.22	M:0.1
secretary	students	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
secretary	book	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
secretary	conference	M:0.14	H:1.0	L:0.0	M:0.069	H:0.2	H:0.13
secretary	paper	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
secretary	exam	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
secretary	external examiner	H:0.33	H:0.5	L:0.0	H:0.16	H:0.28	M:0.12
secretary	thesis	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
secretary	supervisor	H:0.33	H:0.5	L:0.0	H:0.16	H:0.28	M:0.12
secretary	examiner	H:0.25	H:1.0	L:0.0	H:0.13	H:0.27	H:0.15
secretary	report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
secretary	computer	H:0.25	H:0.5	L:0.0	H:0.13	H:0.22	M:0.1
secretary	micro	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
secretary	mini	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
secretary	main frame	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
secretary	computer officer	H:0.25	H:0.5	L:0.0	H:0.13	H:0.22	M:0.1
secretary	sponsor	H:0.33	H:1.0	L:0.0	H:0.16	H:0.33	H:0.17
secretary	project	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
secretary	researcher	H:0.25	H:0.5	L:0.0	H:0.13	H:0.22	M:0.1
secretary	machines	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
secretary	advertisement	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
secretary	person	H:0.25	H:1.0	L:0.0	H:0.13	H:0.27	H:0.15
secretary	form	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
secretary	accepted candidate	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
secretary	technical report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
secretary	research student	H:0.5	H:1.0	L:0.0	H:0.25	H:0.45	H:0.2
secretary	document	L:0.0	L:0.0	H:1.0	H:0.5	H:0.2	H:0.7
secretary	class room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
secretary	subjects	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
secretary	Lab.	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
secretary	demonstrator	H:0.33	H:1.0	L:0.0	H:0.16	H:0.33	H:0.17
secretary	degree	M:0.17	M:0.33	L:0.0	M:0.079	M:0.15	M:0.069
secretary	speaker	M:0.2	H:1.0	L:0.0	M:0.1	H:0.24	H:0.14
secretary	seminar	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
secretary	graduation	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
document	department	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
document	head	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
document	secretaries	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
document	staff	M:0.17	L:0.0	L:0.0	M:0.079	M:0.12	L:0.03
document	room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
document	course	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
document	student	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
document	lecturer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
document	subject	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
document	equipment	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
document	technician	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
document	students	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
document	book	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
document	conference	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
document	paper	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
document	exam	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
document	external examiner	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
document	thesis	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
document	supervisor	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
document	examiner	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
document	report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
document	computer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
document	micro	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
document	mini	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
document	main frame	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
document	computer officer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
document	sponsor	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0

document	project	M:0.14	L:0.0	L:0.0	M:0.069	M:0.1	L:0.03
document	researcher	H:0.25	L:0.0	L:0.0	H:0.13	M:0.17	M:0.05
document	machines	M:0.2	L:0.0	L:0.0	M:0.1	M:0.14	L:0.04
document	advertisement	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
document	person	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
document	form	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
document	accepted candidate	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
document	technical report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
document	research student	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
document	secretary	L:0.0	L:0.0	H:1.0	H:0.5	H:0.2	H:0.7
document	class room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
document	subjects	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
document	Lab.	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
document	demonstrator	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
document	degree	M:0.17	L:0.0	L:0.0	M:0.079	M:0.12	L:0.03
document	speaker	M:0.2	L:0.0	L:0.0	M:0.1	M:0.14	L:0.04
document	seminar	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
document	graduation	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
class room	department	L:0.0	L:0.0	M:0.13	M:0.059	L:0.03	M:0.089
class room	head	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
class room	secretaries	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
class room	staff	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
class room	room	H:0.25	M:0.33	L:0.0	H:0.13	H:0.21	M:0.079
class room	course	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
class room	student	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
class room	lecturer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
class room	subject	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
class room	equipment	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
class room	technician	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
class room	students	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
class room	book	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
class room	conference	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
class room	paper	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
class room	exam	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
class room	external examiner	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
class room	thesis	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
class room	supervisor	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
class room	examiner	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
class room	report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
class room	computer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
class room	micro	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
class room	mini	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
class room	main frame	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
class room	computer officer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
class room	sponsor	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
class room	project	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
class room	researcher	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
class room	machines	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
class room	advertisement	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
class room	person	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
class room	form	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
class room	accepted candidate	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
class room	technical report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
class room	research student	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
class room	secretary	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
class room	document	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
class room	subjects	L:0.0	L:0.0	M:0.2	M:0.1	L:0.04	H:0.14
class room	Lab.	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
class room	demonstrator	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
class room	degree	L:0.0	L:0.0	M:0.25	H:0.13	L:0.05	H:0.17
class room	speaker	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
class room	seminar	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
class room	graduation	L:0.0	L:0.0	H:0.33	H:0.16	L:0.069	H:0.23

subjects	department	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
subjects	head	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
subjects	secretaries	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
subjects	staff	M:0.2	L:0.0	L:0.0	M:0.1	M:0.14	L:0.04
subjects	room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
subjects	course	L:0.0	L:0.0	H:0.29	H:0.14	L:0.059	H:0.2
subjects	student	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
subjects	lecturer	H:0.25	M:0.25	M:0.089	H:0.17	H:0.22	H:0.14
subjects	subject	L:0.0	L:0.0	M:0.2	M:0.1	L:0.04	H:0.14
subjects	equipment	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
subjects	technician	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
subjects	students	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
subjects	book	M:0.2	M:0.2	L:0.0	M:0.1	M:0.16	M:0.059
subjects	conference	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
subjects	paper	H:0.5	H:0.5	L:0.0	H:0.25	H:0.4	H:0.15
subjects	exam	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
subjects	external examiner	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
subjects	thesis	H:0.5	H:0.5	L:0.0	H:0.25	H:0.4	H:0.15
subjects	supervisor	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
subjects	examiner	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
subjects	report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
subjects	computer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
subjects	micro	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
subjects	mini	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
subjects	main frame	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
subjects	computer officer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
subjects	sponsor	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
subjects	project	M:0.17	H:0.5	L:0.0	M:0.079	M:0.17	M:0.079
subjects	researcher	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
subjects	machines	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
subjects	advertisement	M:0.2	H:1.0	L:0.0	M:0.1	H:0.24	H:0.14
subjects	person	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
subjects	form	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
subjects	accepted candidate	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
subjects	technical report	M:0.17	M:0.33	L:0.0	M:0.079	M:0.15	M:0.069
subjects	research student	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
subjects	secretary	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
subjects	document	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
subjects	class room	L:0.0	L:0.0	M:0.2	M:0.1	L:0.04	H:0.14
subjects	Lab.	L:0.0	L:0.0	M:0.2	M:0.1	L:0.04	H:0.14
subjects	demonstrator	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
subjects	degree	M:0.2	M:0.33	M:0.17	H:0.18	H:0.21	H:0.19
subjects	speaker	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
subjects	seminar	M:0.14	H:1.0	L:0.0	M:0.069	H:0.2	H:0.13
subjects	graduation	L:0.0	L:0.0	M:0.2	M:0.1	L:0.04	H:0.14
Lab.	department	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
Lab.	head	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
Lab.	secretaries	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
Lab.	staff	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
Lab.	room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
Lab.	course	L:0.0	L:0.0	M:0.17	M:0.079	L:0.03	M:0.12
Lab.	student	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
Lab.	lecturer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
Lab.	subject	L:0.0	L:0.0	H:0.33	H:0.16	L:0.069	H:0.23
Lab.	equipment	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
Lab.	technician	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
Lab.	students	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
Lab.	book	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
Lab.	conference	M:0.14	L:0.0	L:0.0	M:0.069	M:0.1	L:0.03
Lab.	paper	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
Lab.	exam	H:0.25	H:0.5	L:0.0	H:0.13	H:0.22	M:0.1
Lab.	external examiner	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
Lab.	thesis	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0

Lab.	supervisor	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
Lab.	examiner	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
Lab.	report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
Lab.	computer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
Lab.	micro	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
Lab.	mini	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
Lab.	main frame	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
Lab.	computer officer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
Lab.	sponsor	L:0.0	L:0.0	M:0.25	H:0.13	L:0.05	H:0.17
Lab.	project	L:0.0	L:0.0	L:0.0	L:0.0	L:0 0	L:0.0
Lab.	researcher	L:0.0	L:0.0	M:0.2	M:0.1	L:0.04	H:0.14
Lab.	machines	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
Lab.	advertisement	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
Lab.	person	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
Lab.	form	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
Lab.	accepted candidate	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
Lab.	technical report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
Lab.	research student	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
Lab.	secretary	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
Lab.	document	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
Lab.	class room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
Lab.	subjects	L:0.0	L:0.0	M:0.2	M:0.1	L:0.04	H:0.14
Lab.	demonstrator	L:0.0	L:0.0	H:0.5	H:0.25	M:0.1	H:0.35
Lab.	degree	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
Lab.	speaker	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
Lab.	seminar	M:0.13	L:0.0	L:0.0	M:0.059	M:0.09	L:0.03
Lab.	graduation	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
demonstrator	department	H:0.25	M:0.33	L:0.0	H:0.13	H:0.21	M:0.079
demonstrator	head	H:0.33	H:1.0	L:0.0	H:0.16	H:0.33	H:0.17
demonstrator	secretaries	H:0.25	H:0.5	L:0.0	H:0.13	H:0.22	M:0.1
demonstrator	staff	M:0.17	H:0.5	L:0.0	M:0.079	M:0.17	M:0.079
demonstrator	room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
demonstrator	course	M:0.17	M:0.33	L:0.0	M:0.079	M:0.15	M:0.069
demonstrator	student	M:0.17	L:0.0	L:0.0	M:0.079	M:0.12	L:0.03
demonstrator	lecturer	M:0.2	M:0.25	L:0.0	M:0.1	M:0.16	M:0.059
demonstrator	subject	H:0.25	M:0.33	L:0.0	H:0.13	H:0.21	M:0.079
demonstrator	equipment	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
demonstrator	technician	H:0.25	H:0.5	L:0.0	H:0.13	H:0.22	M:0.1
demonstrator	students	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
demonstrator	book	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
demonstrator	conference	M:0.14	H:1.0	L:0.0	M:0.069	H:0.2	H:0.13
demonstrator	paper	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
demonstrator	exam	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
demonstrator	external examiner	H:0.33	H:0.5	L:0.0	H:0.16	H:0.28	M:0.12
demonstrator	thesis	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
demonstrator	supervisor	H:0.33	H:0.5	L:0.0	H:0.16	H:0.28	M:0.12
demonstrator	examiner	H:0.25	H:1.0	L:0.0	H:0.13	H:0.27	H:0.15
demonstrator	report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
demonstrator	computer	H:0.25	H:0.5	L:0.0	H:0.13	H:0.22	M:0.1
demonstrator	micro	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
demonstrator	mini	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
demonstrator	main frame	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
demonstrator	computer officer	H:0.25	H:0.5	L:0.0	H:0.13	H:0.22	M:0.1
demonstrator	sponsor	H:0.33	H:1.0	H:0.33	H:0.33	H:0.4	H:0.4
demonstrator	project	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
demonstrator	researcher	H:0.25	H:0.5	M:0.25	H:0.25	H:0.27	H:0.27
demonstrator	machines	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
demonstrator	advertisement	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
demonstrator	person	H:0.25	H:1.0	L:0.0	H:0.13	H:0.27	H:0.15
demonstrator	form	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
demonstrator	accepted candidate	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
demonstrator	technical report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
demonstrator	research student	H:0.5	H:1.0	L:0.0	H:0.25	H:0.45	H:0.2

demonstrator	secretary	H:0.33	H:1.0	L:0.0	H:0.16	H:0.33	H:0.17
demonstrator	document	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
demonstrator	class room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
demonstrator	subjects	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
demonstrator	Lab.	L:0.0	L:0.0	H:0.5	H:0.25	M:0.1	H:0.35
demonstrator	degree	M:0.17	M:0.33	L:0.0	M:0.079	M:0.15	M:0.069
demonstrator	speaker	M:0.2	H:1.0	L:0.0	M:0.1	H:0.24	H:0.14
demonstrator	seminar	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
demonstrator	graduation	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
degree	department	M:0.14	M:0.2	L:0.0	M:0.069	M:0.12	M:0.05
degree	head	M:0.17	M:0.33	L:0.0	M:0.079	M:0.15	M:0.069
degree	secretaries	M:0.14	M:0.25	L:0.0	M:0.069	M:0.12	M:0.05
degree	staff	H:0.43	M:0.25	L:0.0	H:0.21	H:0.33	M:0.11
degree	room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
degree	course	H:0.25	M:0.2	L:0.0	H:0.13	M:0.19	M:0.069
degree	student	H:0.25	L:0.0	M:0.079	H:0.16	M:0.19	M:0.11
degree	lecturer	H:0.29	M:0.4	L:0.0	H:0.14	H:0.24	M:0.1
degree	subject	M:0.14	M:0.2	L:0.0	M:0.069	M:0.12	M:0.05
degree	equipment	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
degree	technician	M:0.14	M:0.25	L:0.0	M:0.069	M:0.12	M:0.05
degree	students	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
degree	book	M:0.11	M:0.14	L:0.0	M:0.05	M:0.09	L:0.04
degree	conference	M:0.1	M:0.33	L:0.0	M:0.05	M:0.1	M:0.05
degree	paper	M:0.17	M:0.25	L:0.0	M:0.079	M:0.14	M:0.059
degree	exam	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
degree	external examiner	M:0.17	M:0.25	L:0.0	M:0.079	M:0.14	M:0.059
degree	thesis	M:0.17	M:0.25	L:0.0	M:0.079	M:0.14	M:0.059
degree	supervisor	M:0.17	M:0.25	L:0.0	M:0.079	M:0.14	M:0.059
degree	examiner	M:0.14	M:0.33	L:0.0	M:0.069	M:0.13	M:0.059
degree	report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
degree	computer	M:0.14	M:0.25	L:0.0	M:0.069	M:0.12	M:0.05
degree	micro	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
degree	mini	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
degree	main frame	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
degree	computer officer	M:0.14	M:0.25	L:0.0	M:0.069	M:0.12	M:0.05
degree	sponsor	M:0.17	M:0.33	L:0.0	M:0.079	M:0.15	M:0.069
degree	project	H:0.22	M:0.25	M:0.11	H:0.16	H:0.2	H:0.15
degree	researcher	H:0.33	M:0.25	L:0.0	H:0.16	H:0.26	M:0.089
degree	machines	M:0.13	L:0.0	L:0.0	M:0.059	M:0.09	L:0.03
degree	advertisement	M:0.11	M:0.33	L:0.0	M:0.05	M:0.11	M:0.05
degree	person	M:0.14	M:0.33	L:0.0	M:0.069	M:0.13	M:0.059
degree	form	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
degree	accepted candidate	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
degree	technical report	M:0.1	M:0.2	L:0.0	M:0.05	M:0.09	L:0.04
degree	research student	M:0.2	M:0.33	L:0.0	M:0.1	M:0.17	M:0.069
degree	secretary	M:0.17	M:0.33	L:0.0	M:0.079	M:0.15	M:0.069
degree	document	M:0.17	L:0.0	L:0.0	M:0.079	M:0.12	L:0.03
degree	class room	L:0.0	L:0.0	M:0.25	H:0.13	L:0.05	H:0.17
degree	subjects	M:0.2	M:0.33	M:0.17	H:0.18	H:0.21	H:0.19
degree	Lab.	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
degree	demonstrator	M:0.17	M:0.33	L:0.0	M:0.079	M:0.15	M:0.069
degree	speaker	H:0.29	M:0.33	L:0.0	H:0.14	H:0.24	M:0.089
degree	seminar	M:0.089	M:0.33	L:0.0	L:0.04	M:0.1	M:0.05
degree	graduation	L:0.0	L:0.0	M:0.25	H:0.13	L:0.05	H:0.17
speaker	department	M:0.17	M:0.33	L:0.0	M:0.079	M:0.15	M:0.069
speaker	head	M:0.2	H:1.0	L:0.0	M:0.1	H:0.24	H:0.14
speaker	secretaries	M:0.17	H:0.5	L:0.0	M:0.079	M:0.17	M:0.079
speaker	staff	H:0.29	H:0.5	L:0.0	H:0.14	H:0.25	M:0.11
speaker	room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
speaker	course	M:0.13	M:0.33	L:0.0	M:0.059	M:0.12	M:0.059
speaker	student	M:0.13	L:0.0	L:0.0	M:0.059	M:0.09	L:0.03
speaker	lecturer	M:0.14	M:0.25	L:0.0	M:0.069	M:0.12	M:0.05
speaker	subject	M:0.17	M:0.33	L:0.0	M:0.079	M:0.15	M:0.069

speaker	equipment	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
speaker	technician	M:0.17	H:0.5	L:0.0	M:0.079	M:0.17	M:0.079
speaker	students	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
speaker	book	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
speaker	conference	M:0.11	H:1.0	L:0.0	M:0.05	M:0.18	M:0.12
speaker	paper	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
speaker	exam	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
speaker	external examiner	M:0.2	H:0.5	L:0.0	M:0.1	M:0.19	M:0.089
speaker	thesis	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
speaker	supervisor	M:0.2	H:0.5	L:0.0	M:0.1	M:0.19	M:0.089
speaker	examiner	M:0.17	H:1.0	L:0.0	M:0.079	H:0.22	H:0.13
speaker	report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
speaker	computer	M:0.17	H:0.5	L:0.0	M:0.079	M:0.17	M:0.079
speaker	micro	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
speaker	mini	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
speaker	main frame	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
speaker	computer officer	M:0.17	H:0.5	L:0.0	M:0.079	M:0.17	M:0.079
speaker	sponsor	M:0.2	H:1.0	L:0.0	M:0.1	H:0.24	H:0.14
speaker	project	M:0.11	L:0.0	L:0.0	M:0.05	M:0.08	L:0.02
speaker	researcher	H:0.4	H:0.5	L:0.0	H:0.2	H:0.33	H:0.13
speaker	machines	M:0.14	L:0.0	L:0.0	M:0.069	M:0.1	L:0.03
speaker	advertisement	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
speaker	person	M:0.17	H:1.0	L:0.0	M:0.079	H:0.22	H:0.13
speaker	form	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
speaker	accepted candidate	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
speaker	technical report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
speaker	research student	H:0.25	H:1.0	L:0.0	H:0.13	H:0.27	H:0.15
speaker	secretary	M:0.2	H:1.0	L:0.0	M:0.1	H:0.24	H:0.14
speaker	document	M:0.2	L:0.0	L:0.0	M:0.1	M:0.14	L:0.04
speaker	class room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
speaker	subjects	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
speaker	Lab.	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
speaker	demonstrator	M:0.2	H:1.0	L:0.0	M:0.1	H:0.24	H:0.14
speaker	degree	H:0.29	M:0.33	L:0.0	H:0.14	H:0.24	M:0.089
speaker	seminar	L:0.0	L:0.0	H:1.0	H:0.5	H:0.2	H:0.7
speaker	graduation	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
seminar	department	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
seminar	head	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
seminar	secretaries	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
seminar	staff	M:0.089	L:0.0	L:0.0	L:0.04	L:0.059	L:0.02
seminar	room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
seminar	course	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
seminar	student	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
seminar	lecturer	H:0.22	M:0.25	L:0.0	M:0.11	M:0.18	M:0.069
seminar	subject	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
seminar	equipment	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
seminar	technician	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
seminar	students	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
seminar	book	M:0.089	M:0.2	L:0.0	L:0.04	M:0.08	L:0.04
seminar	conference	H:0.3	L:0.0	L:0.0	H:0.15	H:0.21	M:0.059
seminar	paper	M:0.13	H:0.5	L:0.0	M:0.059	M:0.14	M:0.079
seminar	exam	M:0.11	L:0.0	L:0.0	M:0.05	M:0.08	L:0.02
seminar	external examiner	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
seminar	thesis	M:0.13	H:0.5	L:0.0	M:0.059	M:0.14	M:0.079
seminar	supervisor	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
seminar	examiner	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
seminar	report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
seminar	computer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
seminar	micro	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
seminar	mini	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
seminar	main frame	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
seminar	computer officer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
seminar	sponsor	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0

seminar	project	M:0.079	H:0.5	L:0.0	L:0.04	M:0.11	M:0.069
seminar	researcher	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
seminar	machines	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
seminar	advertisement	M:0.2	H:1.0	L:0.0	M:0.1	H:0.24	H:0.14
seminar	person	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
seminar	form	M:0.089	L:0.0	L:0.0	L:0.04	L:0.059	L:0.02
seminar	accepted candidate	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
seminar	technical report	M:0.079	M:0.33	L:0.0	L:0.04	M:0.09	M:0.05
seminar	research student	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
seminar	secretary	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
seminar	document	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
seminar	class room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
seminar	subjects	M:0.14	H:1.0	L:0.0	M:0.069	H:0.2	H:0.13
seminar	Lab.	M:0.13	L:0.0	L:0.0	M:0.059	M:0.09	L:0.03
seminar	demonstrator	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
seminar	degree	M:0.089	M:0.33	L:0.0	L:0.04	M:0.1	M:0.05
seminar	speaker	L:0.0	L:0.0	H:1.0	H:0.5	H:0.2	H:0.7
seminar	graduation	H:0.25	L:0.0	L:0.0	H:0.13	M:0.17	M:0.05
graduation	department	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
graduation	head	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
graduation	secretaries	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
graduation	staff	L:0.0	L:0.0	M:0.14	M:0.069	L:0.03	M:0.1
graduation	room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
graduation	course	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
graduation	student	L:0.0	L:0.0	M:0.079	L:0.04	L:0.02	M:0.059
graduation	lecturer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
graduation	subject	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
graduation	equipment	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
graduation	technician	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
graduation	students	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
graduation	book	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
graduation	conference	M:0.13	L:0.0	H:0.33	H:0.23	M:0.16	H:0.26
graduation	paper	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
graduation	exam	M:0.2	L:0.0	L:0.0	M:0.1	M:0.14	L:0.04
graduation	external examiner	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
graduation	thesis	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
graduation	supervisor	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
graduation	examiner	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
graduation	report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
graduation	computer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
graduation	micro	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
graduation	mini	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
graduation	main frame	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
graduation	computer officer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
graduation	sponsor	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
graduation	project	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
graduation	researcher	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
graduation	machines	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
graduation	advertisement	M:0.14	L:0.0	L:0.0	M:0.069	M:0.1	L:0.03
graduation	person	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
graduation	form	M:0.14	L:0.0	L:0.0	M:0.069	M:0.1	L:0.03
graduation	accepted candidate	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
graduation	technical report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
graduation	research student	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
graduation	secretary	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
graduation	document	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
graduation	class room	L:0.0	L:0.0	H:0.33	H:0.16	L:0.069	H:0.23
graduation	subjects	L:0.0	L:0.0	M:0.2	M:0.1	L:0.04	H:0.14
graduation	Lab.	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
graduation	demonstrator	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
graduation	degree	L:0.0	L:0.0	M:0.25	H:0.13	L:0.05	H:0.17
graduation	speaker	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
graduation	seminar	H:0.25	L:0.0	L:0.0	H:0.13	M:0.17	M:0.05

		Wpa=1 Wpk=0 Wpr=0	Wpa=0 Wpk=1 Wpr=0	Wpa=0 Wpk=0 Wpr=1	Wpa=.5 Wpk=0 Wpr=.5	Wpa=.7 Wpk=.1 Wpr=.2	Wpa=.2 Wpk=.1 Wpr=.7
Entity 1	Entity 2	SLF1	SLF2	SLF3	SLF4	SLF5	SLF6
department	head	H:0.25	M:0.33	M:0.14	M:0.19	M:0.23	M:0.17
department	secretaries	M:0.2	M:0.25	M:0.14	M:0.17	M:0.19	M:0.16
department	staff	H:0.33	H:0.669	M:0.079	M:0.16	H:0.27	M:0.13
department	room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
department	course	M:0.14	M:0.2	M:0.089	M:0.11	M:0.13	M:0.11
department	student	M:0.14	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
department	lecturer	M:0.17	M:0.17	L:0.0	L:0.0	L:0.0	L:0.0
department	subject	M:0.2	M:0.2	L:0.0	L:0.0	L:0.0	L:0.0
department	equipment	M:0.2	M:0.25	M:0.11	M:0.15	M:0.18	M:0.13
department	technician	M:0.2	M:0.25	L:0.0	L:0.0	L:0.0	L:0.0
department	students	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
department	book	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
department	conference	M:0.13	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
department	paper	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
department	exam	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
department	external examiner	H:0.25	M:0.25	L:0.0	L:0.0	L:0.0	L:0.0
department	thesis	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
department	supervisor	H:0.25	M:0.25	L:0.0	L:0.0	L:0.0	L:0.0
department	examiner	M:0.2	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
department	report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
department	computer	M:0.2	M:0.25	L:0.0	L:0.0	L:0.0	L:0.0
department	micro	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
department	mini	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
department	main frame	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
department	computer officer	M:0.2	M:0.25	L:0.0	L:0.0	L:0.0	L:0.0
department	sponsor	H:0.25	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
department	project	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
department	researcher	M:0.2	M:0.25	L:0.0	L:0.0	L:0.0	L:0.0
department	machines	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
department	advertisement	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
department	person	M:0.2	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
department	form	M:0.14	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
department	accepted candidate	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
department	technical report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
department	research student	H:0.33	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
department	secretary	H:0.25	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
department	document	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
department	class room	L:0.0	L:0.0	M:0.13	L:0.0	L:0.0	L:0.0
department	subjects	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
department	Lab.	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
department	demonstrator	H:0.25	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
department	degree	M:0.14	M:0.2	L:0.0	L:0.0	L:0.0	L:0.0
department	speaker	M:0.17	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
department	seminar	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
department	graduation	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
head	department	H:0.25	M:0.33	M:0.14	M:0.19	M:0.23	M:0.17
head	secretaries	H:0.25	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
head	staff	M:0.17	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
head	room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
head	course	M:0.17	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
head	student	M:0.17	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
head	lecturer	M:0.2	M:0.25	L:0.0	L:0.0	L:0.0	L:0.0
head	subject	H:0.25	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
head	equipment	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
head	technician	H:0.25	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
head	students	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
head	book	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0

head	conference	M:0.14	H:1.0	L:0.0	L:0.0	L:0.0	L:0.0
head	paper	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
head	exam	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
head	external examiner	H:0.33	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
head	thesis	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
head	supervisor	H:0.33	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
head	examiner	H:0.25	H:1.0	L:0.0	L:0.0	L:0.0	L:0.0
head	report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
head	computer	H:0.25	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
head	micro	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
head	mini	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
head	main frame	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
head	computer officer	H:0.25	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
head	sponsor	H:0.33	H:1.0	L:0.0	L:0.0	L:0.0	L:0.0
head	project	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
head	researcher	H:0.25	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
head	machines	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
head	advertisement	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
head	person	H:0.25	H:1.0	L:0.0	L:0.0	L:0.0	L:0.0
head	form	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
head	accepted candidate	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
head	technical report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
head	research student	H:0.5	H:1.0	L:0.0	L:0.0	L:0.0	L:0.0
head	secretary	H:0.33	H:1.0	L:0.0	L:0.0	L:0.0	L:0.0
head	document	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
head	class room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
head	subjects	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
head	Lab.	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
head	demonstrator	H:0.33	H:1.0	L:0.0	L:0.0	L:0.0	L:0.0
head	degree	M:0.17	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
head	speaker	M:0.2	H:1.0	L:0.0	L:0.0	L:0.0	L:0.0
head	seminar	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
head	graduation	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
secretaries	department	M:0.2	M:0.25	M:0.14	M:0.17	M:0.19	M:0.16
secretaries	head	H:0.25	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
secretaries	staff	M:0.14	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
secretaries	room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
secretaries	course	M:0.14	M:0.25	L:0.0	L:0.0	L:0.0	L:0.0
secretaries	student	M:0.14	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
secretaries	lecturer	M:0.17	M:0.2	L:0.0	L:0.0	L:0.0	L:0.0
secretaries	subject	M:0.2	M:0.25	L:0.0	L:0.0	L:0.0	L:0.0
secretaries	equipment	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
secretaries	technician	M:0.2	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
secretaries	students	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
secretaries	book	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
secretaries	conference	M:0.13	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
secretaries	paper	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
secretaries	exam	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
secretaries	external examiner	H:0.25	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
secretaries	thesis	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
secretaries	supervisor	H:0.25	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
secretaries	examiner	M:0.2	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
secretaries	report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
secretaries	computer	M:0.2	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
secretaries	micro	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
secretaries	mini	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
secretaries	main frame	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
secretaries	computer officer	H:0.5	H:1.0	L:0.0	L:0.0	L:0.0	L:0.0
secretaries	sponsor	H:0.25	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
secretaries	project	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
secretaries	researcher	M:0.2	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
secretaries	machines	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
secretaries	advertisement	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0

secretaries	person	M:0.2	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
secretaries	form	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
secretaries	accepted candidate	M:0.2	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
secretaries	technical report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
secretaries	research student	H:0.33	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
secretaries	secretary	H:0.25	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
secretaries	document	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
secretaries	class room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
secretaries	subjects	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
secretaries	Lab.	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
secretaries	demonstrator	H:0.25	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
secretaries	degree	M:0.14	M:0.25	L:0.0	L:0.0	L:0.0	L:0.0
secretaries	speaker	M:0.17	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
secretaries	seminar	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
secretaries	graduation	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
staff	department	H:0.33	H:0.669	M:0.079	M:0.16	H:0.27	M:0.13
staff	head	M:0.17	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
staff	secretaries	M:0.14	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
staff	room	L:0.0	L:0.0	M:0.14	L:0.0	L:0.0	L:0.0
staff	course	M:0.11	M:0.25	L:0.0	L:0.0	L:0.0	L:0.0
staff	student	M:0.11	L:0.0	M:0.13	M:0.12	L:0.0	L:0.0
staff	lecturer	H:0.29	M:0.2	L:0.0	L:0.0	L:0.0	L:0.0
staff	subject	M:0.14	M:0.25	L:0.0	L:0.0	L:0.0	L:0.0
staff	equipment	M:0.14	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
staff	technician	M:0.14	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
staff	students	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
staff	book	M:0.11	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
staff	conference	M:0.1	H:0.5	M:0.14	M:0.12	M:0.13	M:0.15
staff	paper	M:0.17	L:0.0	M:0.14	M:0.15	L:0.0	L:0.0
staff	exam	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
staff	external examiner	M:0.17	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
staff	thesis	M:0.17	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
staff	supervisor	M:0.17	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
staff	examiner	M:0.14	H:0.5	M:0.14	M:0.14	M:0.16	M:0.16
staff	report	L:0.0	L:0.0	M:0.17	L:0.0	L:0.0	L:0.0
staff	computer	M:0.14	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
staff	micro	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
staff	mini	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
staff	main frame	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
staff	computer officer	M:0.14	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
staff	sponsor	M:0.17	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
staff	project	H:0.22	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
staff	researcher	H:0.33	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
staff	machines	M:0.13	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
staff	advertisement	M:0.11	L:0.0	M:0.17	M:0.14	L:0.0	L:0.0
staff	person	M:0.14	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
staff	form	M:0.11	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
staff	accepted candidate	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
staff	technical report	M:0.1	L:0.0	M:0.17	M:0.13	L:0.0	L:0.0
staff	research student	M:0.2	H:0.5	M:0.17	M:0.18	M:0.21	M:0.2
staff	secretary	M:0.17	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
staff	document	M:0.17	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
staff	class room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
staff	subjects	M:0.2	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
staff	Lab.	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
staff	demonstrator	M:0.17	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
staff	degree	H:0.43	M:0.25	L:0.0	L:0.0	L:0.0	L:0.0
staff	speaker	H:0.29	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
staff	seminar	M:0.089	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
staff	graduation	L:0.0	L:0.0	M:0.14	L:0.0	L:0.0	L:0.0
room	department	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
room	head	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
room	secretaries	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0

room	staff	L:0.0	L:0.0	M:0.14	L:0.0	L:0.0	L:0.0
room	course	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
room	student	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
room	lecturer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
room	subject	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
room	equipment	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
room	technician	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
room	students	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
room	book	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
room	conference	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
room	paper	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
room	exam	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
room	external examiner	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
room	thesis	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
room	supervisor	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
room	examiner	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
room	report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
room	computer	L:0.0	L:0.0	M:0.2	L:0.0	L:0.0	L:0.0
room	micro	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
room	mini	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
room	main frame	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
room	computer officer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
room	sponsor	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
room	project	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
room	researcher	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
room	machines	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
room	advertisement	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
room	person	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
room	form	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
room	accepted candidate	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
room	technical report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
room	research student	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
room	secretary	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
room	document	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
room	class room	H:0.25	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
room	subjects	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
room	Lab.	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
room	demonstrator	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
room	degree	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
room	speaker	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
room	seminar	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
room	graduation	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
course	department	M:0.14	M:0.2	M:0.089	M:0.11	M:0.13	M:0.11
course	head	M:0.17	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
course	secretaries	M:0.14	M:0.25	L:0.0	L:0.0	L:0.0	L:0.0
course	staff	M:0.11	M:0.25	L:0.0	L:0.0	L:0.0	L:0.0
course	room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
course	student	H:0.25	L:0.0	M:0.14	M:0.19	L:0.0	L:0.0
course	lecturer	H:0.29	M:0.4	L:0.0	L:0.0	L:0.0	L:0.0
course	subject	H:0.33	H:0.5	M:0.17	H:0.24	H:0.3	M:0.22
course	equipment	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
course	technician	M:0.14	M:0.25	L:0.0	L:0.0	L:0.0	L:0.0
course	students	M:0.13	M:0.17	L:0.0	L:0.0	L:0.0	L:0.0
course	book	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
course	conference	M:0.1	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
course	paper	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
course	exam	M:0.14	M:0.25	L:0.0	L:0.0	L:0.0	L:0.0
course	external examiner	M:0.17	M:0.25	L:0.0	L:0.0	L:0.0	L:0.0
course	thesis	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
course	supervisor	M:0.17	M:0.25	L:0.0	L:0.0	L:0.0	L:0.0
course	examiner	H:0.33	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
course	report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
course	computer	H:0.33	H:0.669	M:0.13	H:0.21	H:0.29	M:0.18

course	micro	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
course	mini	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
course	main frame	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
course	computer officer	M:0.14	M:0.25	L:0.0	L:0.0	L:0.0	L:0.0
course	sponsor	M:0.17	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
course	project	M:0.1	M:0.25	L:0.0	L:0.0	L:0.0	L:0.0
course	researcher	H:0.33	H:0.669	L:0.0	L:0.0	L:0.0	L:0.0
course	machines	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
course	advertisement	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
course	person	M:0.14	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
course	form	M:0.11	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
course	accepted candidate	L:0.0	L:0.0	M:0.17	L:0.0	L:0.0	L:0.0
course	technical report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
course	research student	M:0.2	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
course	secretary	M:0.17	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
course	document	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
course	class room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
course	subjects	L:0.0	L:0.0	H:0.29	L:0.0	L:0.0	L:0.0
course	Lab.	L:0.0	L:0.0	M:0.17	L:0.0	L:0.0	L:0.0
course	demonstrator	M:0.17	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
course	degree	H:0.25	M:0.2	L:0.0	L:0.0	L:0.0	L:0.0
course	speaker	M:0.13	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
course	seminar	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
course	graduation	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
student	department	M:0.14	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
student	head	M:0.17	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
student	secretaries	M:0.14	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
student	staff	M:0.11	L:0.0	M:0.13	M:0.12	L:0.0	L:0.0
student	room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
student	course	H:0.25	L:0.0	M:0.14	M:0.19	L:0.0	L:0.0
student	lecturer	M:0.13	L:0.0	M:0.059	M:0.089	L:0.0	L:0.0
student	subject	H:0.33	L:0.0	M:0.079	M:0.16	L:0.0	L:0.0
student	equipment	L:0.0	L:0.0	M:0.079	L:0.0	L:0.0	L:0.0
student	technician	M:0.14	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
student	students	M:0.13	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
student	book	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
student	conference	M:0.1	L:0.0	M:0.079	M:0.089	L:0.0	L:0.0
student	paper	L:0.0	L:0.0	M:0.079	L:0.0	L:0.0	L:0.0
student	exam	M:0.14	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
student	external examiner	M:0.17	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
student	thesis	L:0.0	L:0.0	M:0.089	L:0.0	L:0.0	L:0.0
student	supervisor	M:0.17	L:0.0	M:0.089	M:0.12	L:0.0	L:0.0
student	examiner	M:0.14	L:0.0	M:0.079	M:0.11	L:0.0	L:0.0
student	report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
student	computer	M:0.14	L:0.0	M:0.069	M:0.1	L:0.0	L:0.0
student	micro	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
student	mini	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
student	main frame	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
student	computer officer	M:0.14	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
student	sponsor	M:0.17	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
student	project	M:0.1	L:0.0	M:0.059	M:0.079	L:0.0	L:0.0
student	researcher	M:0.14	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
student	machines	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
student	advertisement	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
student	person	M:0.14	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
student	form	M:0.11	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
student	accepted candidate	L:0.0	L:0.0	M:0.079	L:0.0	L:0.0	L:0.0
student	technical report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
student	research student	M:0.2	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
student	secretary	M:0.17	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
student	document	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
student	class room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
student	subjects	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0

student	Lab.	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
student	demonstrator	M:0.17	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
student	degree	H:0.25	L:0.0	M:0.079	M:0.14	L:0.0	L:0.0
student	speaker	M:0.13	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
student	seminar	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
student	graduation	L:0.0	L:0.0	M:0.079	L:0.0	L:0.0	L:0.0
lecturer	department	M:0.17	M:0.17	L:0.0	L:0.0	L:0.0	L:0.0
lecturer	head	M:0.2	M:0.25	L:0.0	L:0.0	L:0.0	L:0.0
lecturer	secretaries	M:0.17	M:0.2	L:0.0	L:0.0	L:0.0	L:0.0
lecturer	staff	H:0.29	M:0.2	L:0.0	L:0.0	L:0,0	L:0.0
lecturer	room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
lecturer	course	H:0.29	M:0.4	L:0.0	L:0.0	L:0.0	L:0.0
lecturer	student	M:0.13	L:0.0	M:0.059	M:0.089	L:0.0	L:0.0
lecturer	subject	M:0.17	M:0.17	M:0.11	M:0.14	M:0.16	M:0.13
lecturer	equipment	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
lecturer	technician	M:0.17	M:0.2	L:0.0	L:0.0	L:0.0	L:0.0
lecturer	students	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
lecturer	book	M:0.13	L:0.13	M:0.11	M:0.12	M:0.13	M:0.12
lecturer	conference	H:0.25	M:0.25	L:0.0	L:0.0	L:0.0	L:0.0
lecturer	paper	M:0.2	M:0.2	L:0.0	L:0.0	L:0.0	L:0.0
lecturer	exam	L:0.0	L:0.0	M:0.25	L:0.0	L:0.0	L:0.0
lecturer	external examiner	M:0.2	M:0.2	M:0.13	M:0.16	M:0.18	M:0.15
lecturer	thesis	M:0.2	M:0.2	L:0.0	L:0.0	L:0.0	L:0.0
lecturer	supervisor	M:0.2	M:0.2	L:0.0	L:0.0	L:0.0	L:0.0
lecturer	examiner	H:0.4	M:0.25	L:0.0	L:0.0	L:0.0	L:0.0
lecturer	report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
lecturer	computer	H:0.4	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
lecturer	micro	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
lecturer	mini	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
lecturer	main frame	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
lecturer	computer officer	M:0.17	M:0.2	L:0.0	L:0.0	L:0.0	L:0.0
lecturer	sponsor	M:0.2	M:0.25	L:0.0	L:0.0	L:0.0	L:0.0
lecturer	project	M:0.11	M:0.2	M:0.15	M:0.13	M:0.12	M:0.15
lecturer	researcher	H:0.4	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
lecturer	machines	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
lecturer	advertisement	M:0.13	M:0.25	L:0.0	L:0.0	L:0.0	L:0.0
lecturer	person	M:0.17	M:0.25	L:0.0	L:0.0	L:0.0	L:0.0
lecturer	form	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
lecturer	accepted candidate	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
lecturer	technical report	M:0.11	M:0.17	L:0.0	L:0.0	L:0.0	L:0.0
lecturer	research student	H:0.25	M:0.25	L:0.0	L:0.0	L:0.0	L:0.0
lecturer	secretary	M:0.2	M:0.25	L:0.0	L:0.0	L:0.0	L:0.0
lecturer	document	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
lecturer	class room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
lecturer	subjects	H:0.25	M:0.25	M:0.089	M:0.15	M:0.2	M:0.12
lecturer	Lab.	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
lecturer	demonstrator	M:0.2	M:0.25	L:0.0	L:0.0	L:0.0	L:0.0
lecturer	degree	H:0.29	M:0.4	L:0.0	L:0.0	L:0.0	L:0.0
lecturer	speaker	M:0.14	M:0.25	L:0.0	L:0.0	L:0.0	L:0.0
lecturer	seminar	H:0.22	M:0.25	L:0.0	L:0.0	L:0.0	L:0.0
lecturer	graduation	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
subject	department	M:0.2	M:0.2	L:0.0	L:0.0	L:0.0	L:0.0
subject	head	H:0.25	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
subject	secretaries	M:0.2	M:0.25	L:0.0	L:0.0	L:0.0	L:0.0
subject	staff	M:0.14	M:0.25	L:0.0	L:0.0	L:0.0	L:0.0
subject	room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
subject	course	H:0.33	H:0.5	M:0.17	H:0.24	H:0.3	M:0.22
subject	student	H:0.33	L:0.0	M:0.079	M:0.16	L:0.0	L:0.0
subject	lecturer	M:0.17	M:0.17	M:0.11	M:0.14	M:0.16	M:0.13
subject	equipment	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
subject	technician	M:0.2	M:0.25	L:0.0	L:0.0	L:0.0	L:0.0
subject	students	M:0.17	M:0,17	L:0.0	L:0.0	L:0.0	L:0.0
subject	book	M:0.14	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0

subject	conference	M:0.13	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
subject	paper	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
subject	exam	M:0.2	M:0.25	L:0.0	L:0.0	L:0.0	L:0.0
subject	external examiner	H:0.25	M:0.25	L:0.0	L:0.0	L:0.0	L:0.0
subject	thesis	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
subject	supervisor	H:0.25	M:0.25	L:0.0	L:0.0	L:0.0	L:0.0
subject	examiner	M:0.2	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
subject	report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
subject	computer	M:0.2	M:0.25	L:0.0	L:0.0	L:0.0	L:0.0
subject	micro	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
subject	mini	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
subject	main frame	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
subject	computer officer	M:0.2	M:0.25	L:0.0	L:0.0	L:0.0	L:0.0
subject	sponsor	H:0.25	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
subject	project	M:0.13	M:0.25	L:0.0	L:0.0	L:0.0	L:0.0
subject	researcher	M:0.2	M:0.25	L:0.0	L:0.0	L:0.0	L:0.0
subject	machines	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
subject	advertisement	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
subject	person	M:0.2	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
subject	form	M:0.14	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
subject	accepted candidate	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
subject	technical report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
subject	research student	H:0.33	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
subject	secretary	H:0.25	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
subject	document	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
subject	class room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
subject	subjects	L:0.0	L:0.0	M:0.2	L:0.0	L:0.0	L:0.0
subject	Lab.	L:0.0	L:0.0	H:0.33	L:0.0	L:0.0	L:0.0
subject	demonstrator	H:0.25	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
subject	degree	M:0.14	M:0.2	L:0.0	L:0.0	L:0.0	L:0.0
subject	speaker	M:0.17	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
subject	seminar	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
subject	graduation	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
equipment	department	M:0.2	M:0.25	M:0.11	M:0.15	M:0.18	M:0.13
equipment	head	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
equipment	secretaries	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
equipment	staff	M:0.14	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
equipment	room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
equipment	course	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
equipment	student	L:0.0	L:0.0	M:0.079	L:0.0	L:0.0	L:0.0
equipment	lecturer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
equipment	subject	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
equipment	technician	M:0.2	M:0.33	H:0.33	H:0.26	M:0.23	H:0.3
equipment	students	M:0.17	M:0.2	L:0.0	L:0.0	L:0.0	L:0.0
equipment	book	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
equipment	conference	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
equipment	paper	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
equipment	exam	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
equipment	external examiner	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
equipment	thesis	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
equipment	supervisor	H:0.25	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
equipment	examiner	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
equipment	report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
equipment	computer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
equipment	micro	M:0.2	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
equipment	mini	M:0.2	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
equipment	main frame	H:0.25	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
equipment	computer officer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
equipment	sponsor	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
equipment	project	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
equipment	researcher	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
equipment	machines	M:0.17	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
equipment	advertisement	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0

equipment	person	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
equipment	form	M:0.14	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
equipment	accepted candidate	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
equipment	technical report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
equipment	research student	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
equipment	secretary	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
equipment	document	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
equipment	class room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
equipment	subjects	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
equipment	Lab.	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
equipment	demonstrator	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
equipment	degree	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
equipment	speaker	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
equipment	seminar	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
equipment	graduation	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
technician	department	M:0.2	M:0.25	L:0.0	L:0.0	L:0.0	L:0.0
technician	head	H:0.25	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
technician	secretaries	M:0.2	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
technician	staff	M:0.14	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
technician	room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
technician	course	M:0.14	M:0.25	L:0.0	L:0.0	L:0.0	L:0.0
technician	student	M:0.14	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
technician	lecturer	M:0.17	M:0.2	L:0.0	L:0.0	L:0.0	L:0.0
technician	subject	M:0.2	M:0.25	L:0.0	L:0.0	L:0.0	L:0.0
technician	equipment	M:0.2	M:0.33	H:0.33	H:0.26	M:0.23	H:0.3
technician	students	M:0.17	M:0.2	L:0.0	L:0.0	L:0.0	L:0.0
technician	book	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
technician	conference	M:0.13	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
technician	paper	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
technician	exam	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
technician	external examiner	H:0.25	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
technician	thesis	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
technician	supervisor	H:0.669	H:1.0	L:0.0	L:0.0	L:0.0	L:0.0
technician	examiner	M:0.2	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
technician	report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
technician	computer	M:0.2	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
technician	micro	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
technician	mini	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
technician	main frame	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
technician	computer officer	H:0.5	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
technician	sponsor	H:0.25	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
technician	project	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
technician	researcher	M:0.2	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
technician	machines	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
technician	advertisement	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
technician	person	M:0.2	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
technician	form	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
technician	accepted candidate	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
technician	technical report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
technician	research student	H:0.33	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
technician	secretary	H:0.25	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
technician	document	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
technician	class room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
technician	subjects	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
technician	Lab.	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
technician	demonstrator	H:0.25	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
technician	degree	M:0.14	M:0.25	L:0.0	L:0.0	L:0.0	L:0.0
technician	speaker	M:0.17	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
technician	seminar	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
technician	graduation	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
students	department	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
students	head	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
students	secretaries	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0

students	staff	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
students	room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
students	course	M:0.13	M:0.17	L:0.0	L:0.0	L:0.0	L:0.0
students	student	M:0.13	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
students	lecturer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
students	subject	M:0.17	M:0.17	L:0.0	L:0.0	L:0.0	L:0.0
students	equipment	M:0.17	M:0.2	L:0.0	L:0.0	L:0.0	L:0.0
students	technician	M:0.17	M:0.2	L:0.0	L:0.0	L:0.0	L:0.0
students	book	M:0.13	L:0.13	H:0.5	H:0.25	M:0.17	H:0.33
students	conference	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
students	paper	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
students	exam	M:0.17	M:0.2	L:0.0	L:0.0	L:0.0	L:0.0
students	external examiner	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
students	thesis	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
students	supervisor	M:0.2	M:0.2	L:0.0	L:0.0	L:0.0	L:0.0
students	examiner	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
students	report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
students	computer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
students	micro	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
students	mini	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
students	main frame	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
students	computer officer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
students	sponsor	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
students	project	M:0.11	M:0.2	L:0.0	L:0.0	L:0.0	L:0.0
students	researcher	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
students	machines	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
students	advertisement	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
students	person	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
students	form	M:0.13	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
students	accepted candidate	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
students	technical report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
students	research student	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
students	secretary	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
students	document	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
students	class room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
students	subjects	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
students	Lab.	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
students	demonstrator	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
students	degree	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
students	speaker	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
students	seminar	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
students	graduation	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
book	department	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
book	head	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
book	secretaries	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
book	staff	M:0.11	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
book	room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
book	course	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
book	student	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
book	lecturer	M:0.13	L:0.13	M:0.11	M:0.12	M:0.13	M:0.12
book	subject	M:0.14	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
book	equipment	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
book	technician	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
book	students	M:0.13	L:0.13	H:0.5	H:0.25	M:0.17	H:0.33
book	conference	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
book	paper	H:0.4	M:0.4	L:0.0	L:0.0	L:0.0	L:0.0
book	exam	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
book	external examiner	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
book	thesis	M:0.17	M:0.17	L:0.0	L:0.0	L:0.0	L:0.0
book	supervisor	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
book	examiner	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
book	report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
book	computer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0

book	micro	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
book	mini	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
book	main frame	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
book	computer officer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
book	sponsor	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
book	project	M:0.1	M:0.17	L:0.0	L:0.0	L:0.0	L:0.0
book	researcher	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
book	machines	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
book	advertisement	M:0.11	M:0.2	L:0.0	L:0.0	L:0.0	L:0.0
book	person	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
book	form	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
book	accepted candidate	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
book	technical report	H:0.22	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
book	research student	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
book	secretary	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
book	document	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
book	class room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
book	subjects	M:0.2	M:0.2	L:0.0	L:0.0	L:0.0	L:0.0
book	Lab.	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
book	demonstrator	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
book	degree	M:0.11	M:0.14	L:0.0	L:0.0	L:0.0	L:0.0
book	speaker	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
book	seminar	M:0.089	M:0.2	L:0.0	L:0.0	L:0.0	L:0.0
book	graduation	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
conference	department	M:0.13	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
conference	head	M:0.14	H:1.0	L:0.0	L:0.0	L:0.0	L:0.0
conference	secretaries	M:0.13	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
conference	staff	M:0.1	H:0.5	M:0.14	M:0.12	M:0.13	M:0.15
conference	room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
conference	course	M:0.1	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
conference	student	M:0.1	L:0.0	M:0.079	M:0.089	L:0.0	L:0.0
conference	lecturer	H:0.25	M:0.25	L:0.0	L:0.0	L:0.0	L:0.0
conference	subject	M:0.13	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
conference	equipment	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
conference	technician	M:0.13	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
conference	students	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
conference	book	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
conference	paper	L:0.0	L:0.0	H:0.33	L:0.0	L:0.0	L:0.0
conference	exam	M:0.13	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
conference	external examiner	M:0.14	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
conference	thesis	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
conference	supervisor	M:0.14	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
conference	examiner	M:0.13	H:1.0	L:0.0	L:0.0	L:0.0	L:0.0
conference	report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
conference	computer	M:0.13	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
conference	micro	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
conference	mini	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
conference	main frame	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
conference	computer officer	M:0.13	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
conference	sponsor	M:0.14	H:1.0	L:0.0	L:0.0	L:0.0	L:0.0
conference	project	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
conference	researcher	M:0.13	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
conference	machines	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
conference	advertisement	M:0.1	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
conference	person	M:0.13	H:1.0	L:0.0	L:0.0	L:0.0	L:0.0
conference	form	M:0.1	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
conference	accepted candidate	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
conference	technical report	M:0.089	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
conference	research student	M:0.17	H:1.0	L:0.0	L:0.0	L:0.0	L:0.0
conference	secretary	M:0.14	H:1.0	L:0.0	L:0.0	L:0.0	L:0.0
conference	document	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
conference	class room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
conference	subjects	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0

conference	Lab.	M:0.14	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
conference	demonstrator	M:0.14	H:1.0	L:0.0	L:0.0	L:0.0	L:0.0
conference	degree	M:0.1	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
conference	speaker	M:0.11	H:1.0	L:0.0	L:0.0	L:0.0	L:0.0
conference	seminar	H:0.3	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
conference	graduation	M:0.13	L:0.0	H:0.33	H:0.21	L:0.0	L:0.0
paper	department	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
paper	head	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
paper	secretaries	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
paper	staff	M:0.17	L:0.0	M:0.14	M:0.15	L:0.0	L:0.0
paper	room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
paper	course	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
paper	student	L:0.0	L:0.0	M:0.079	L:0.0	L:0.0	L:0.0
paper	lecturer	M:0.2	M:0.2	L:0.0	L:0.0	L:0.0	L:0.0
paper	subject	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
paper	equipment	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
paper	technician	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
paper	students	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
paper	book	H:0.4	M:0.4	L:0.0	L:0.0	L:0.0	L:0.0
paper	conference	L:0.0	L:0.0	H:0.33	L:0.0	L:0.0	L:0.0
paper	exam	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
paper	external examiner	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
paper	thesis	H:0.33	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
paper	supervisor	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
paper	examiner	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
paper	report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
paper	computer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
paper	micro	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
paper	mini	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
paper	main frame	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
paper	computer officer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
paper	sponsor	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
paper	project	M:0.14	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
paper	researcher	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
paper	machines	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
paper	advertisement	M:0.17	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
paper	person	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
paper	form	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
paper	accepted candidate	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
paper	technical report	H:0.33	H:0.669	L:0.0	L:0.0	L:0.0	L:0.0
paper	research student	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
paper	secretary	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
paper	document	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
paper	class room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
paper	subjects	H:0.5	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
paper	Lab.	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
paper	demonstrator	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
paper	degree	M:0.17	M:0.25	L:0.0	L:0.0	L:0.0	L:0.0
paper	speaker	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
paper	seminar	M:0.13	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
paper	graduation	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
exam	department	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
exam	head	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
exam	secretaries	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
exam	staff	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
exam	room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
exam	course	M:0.14	M:0.25	L:0.0	L:0.0	L:0.0	L:0.0
exam	student	M:0.14	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
exam	lecturer	L:0.0	L:0.0	M:0.25	L:0.0	L:0.0	L:0.0
exam	subject	M:0.2	M:0.25	L:0.0	L:0.0	L:0.0	L:0.0
exam	equipment	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
exam	technician	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
exam	students	M:0.17	M:0.2	L:0.0	L:0.0	L:0.0	L:0.0

exam	book	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
exam	conference	M:0.13	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
exam	paper	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
exam	external examiner	L:0.0	L:0.0	H:0.5	L:0.0	L:0.0	L:0.0
exam	thesis	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
exam	supervisor	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
exam	examiner	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
exam	report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
exam	computer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
exam	micro	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
exam	mini	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
exam	main frame	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
exam	computer officer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
exam	sponsor	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
exam	project	M:0.13	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
exam	researcher	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
exam	machines	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
exam	advertisement	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
exam	person	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
exam	form	H:0.33	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
exam	accepted candidate	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
exam	technical report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
exam	research student	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
exam	secretary	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
exam	document	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
exam	class room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
exam	subjects	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
exam	Lab.	H:0.25	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
exam	demonstrator	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
exam	degree	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
exam	speaker	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
exam	seminar	M:0.11	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
exam	graduation	M:0.2	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
external examiner	department	H:0.25	M:0.25	L:0.0	L:0.0	L:0.0	L:0.0
external examiner	head	H:0.33	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
external examiner	secretaries	H:0.25	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
external examiner	staff	M:0.17	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
external examiner	room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
external examiner	course	M:0.17	M:0.25	L:0.0	L:0.0	L:0.0	L:0.0
external examiner	student	M:0.17	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
external examiner	lecturer	M:0.2	M:0.2	M:0.13	M:0.16	M:0.18	M:0.15
external examiner	subject	H:0.25	M:0.25	L:0.0	L:0.0	L:0.0	L:0.0
external examiner	equipment	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
external examiner	technician	H:0.25	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
external examiner	students	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
external examiner	book	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
external examiner	conference	M:0.14	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
external examiner	paper	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
external examiner	exam	L:0.0	L:0.0	H:0.5	L:0.0	L:0.0	L:0.0
external examiner	thesis	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
external examiner	supervisor	H:0.33	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
external examiner	examiner	H:0.25	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
external examiner	report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
external examiner	computer	H:0.25	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
external examiner	micro	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
external examiner	mini	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
external examiner	main frame	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
external examiner	computer officer	H:0.25	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
external examiner	sponsor	H:0.33	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
external examiner	project	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
external examiner	researcher	H:0.25	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
external examiner	machines	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
external examiner	advertisement	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0

external examiner	person	H:0.669	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
external examiner	form	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
external examiner	accepted candidate	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
external examiner	technical report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
external examiner	research student	H:0.5	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
external examiner	secretary	H:0.33	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
external examiner	document	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
external examiner	class room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
external examiner	subjects	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
external examiner	Lab.	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
external examiner	demonstrator	H:0.33	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
external examiner	degree	M:0.17	M:0.25	L:0.0	L:0.0	L:0.0	L:0.0
external examiner	speaker	M:0.2	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
external examiner	seminar	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
external examiner	graduation	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
thesis	department	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
thesis	head	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
thesis	secretaries	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
thesis	staff	M:0.17	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
thesis	room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
thesis	course	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
thesis	student	L:0.0	L:0.0	M:0.089	L:0.0	L:0.0	L:0.0
thesis	lecturer	M:0.2	M:0.2	L:0.0	L:0.0	L:0.0	L:0.0
thesis	subject	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
thesis	equipment	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
thesis	technician	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
thesis	students	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
thesis	book	M:0.17	M:0.17	L:0.0	L:0.0	L:0.0	L:0.0
thesis	conference	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
thesis	paper	H:0.33	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
thesis	exam	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
thesis	external examiner	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
thesis	supervisor	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
thesis	examiner	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
thesis	report	M:0.2	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
thesis	computer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
thesis	micro	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
thesis	mini	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
thesis	main frame	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
thesis	computer officer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
thesis	sponsor	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
thesis	project	M:0.14	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
thesis	researcher	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
thesis	machines	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
thesis	advertisement	M:0.17	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
thesis	person	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
thesis	form	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
thesis	accepted candidate	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
thesis	technical report	M:0.14	M:0.25	L:0.0	L:0.0	L:0.0	L:0.0
thesis	research student	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
thesis	secretary	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
thesis	document	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
thesis	class room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
thesis	subjects	H:0.5	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
thesis	Lab.	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
thesis	demonstrator	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
thesis	degree	M:0.17	M:0.25	L:0.0	L:0.0	L:0.0	L:0.0
thesis	speaker	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
thesis	seminar	M:0.13	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
thesis	graduation	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
supervisor	department	H:0.25	M:0.25	L:0.0	L:0.0	L:0.0	L:0.0
supervisor	head	H:0.33	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
supervisor	secretaries	H:0.25	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0

supervisor	staff	M:0.17	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
supervisor	room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
supervisor	course	M:0.17	M:0.25	L:0.0	L:0.0	L:0.0	L:0.0
supervisor	student	M:0.17	L:0.0	M:0.089	M:0.12	L:0.0	L:0.0
supervisor	lecturer	M:0.2	M:0.2	L:0.0	L:0.0	L:0.0	L:0.0
supervisor	subject	H:0.25	M:0.25	L:0.0	L:0.0	L:0.0	L:0.0
supervisor	equipment	H:0.25	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
supervisor	technician	H:0.669	H:1.0	L:0.0	L:0.0	L:0.0	L:0.0
supervisor	students	M:0.2	M:0.2	L:0.0	L:0.0	L:0.0	L:0.0
supervisor	book	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
supervisor	conference	M:0.14	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
supervisor	paper	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
supervisor	exam	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
supervisor	external examiner	H:0.33	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
supervisor	thesis	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
supervisor	examiner	H:0.25	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
supervisor	report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
supervisor	computer	H:0.25	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
supervisor	micro	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
supervisor	mini	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
supervisor	main frame	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
supervisor	computer officer	H:0.25	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
supervisor	sponsor	H:0.33	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
supervisor	project	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
supervisor	researcher	H:0.25	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
supervisor	machines	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
supervisor	advertisement	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
supervisor	person	H:0.25	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
supervisor	form	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
supervisor	accepted candidate	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
supervisor	technical report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
supervisor	research student	H:0.5	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
supervisor	secretary	H:0.33	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
supervisor	document	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
supervisor	class room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
supervisor	subjects	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
supervisor	Lab.	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
supervisor	demonstrator	H:0.33	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
supervisor	degree	M:0.17	M:0.25	L:0.0	L:0.0	L:0.0	L:0.0
supervisor	speaker	M:0.2	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
supervisor	seminar	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
supervisor	graduation	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
examiner	department	M:0.2	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
examiner	head	H:0.25	H:1.0	L:0.0	L:0.0	L:0.0	L:0.0
examiner	secretaries	M:0.2	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
examiner	staff	M:0.14	H:0.5	M:0.14	M:0.14	M:0.16	M:0.16
examiner	room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
examiner	course	H:0.33	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
examiner	student	M:0.14	L:0.0	M:0.079	M:0.11	L:0.0	L:0.0
examiner	lecturer	H:0.4	M:0.25	L:0.0	L:0.0	L:0.0	L:0.0
examiner	subject	M:0.2	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
examiner	equipment	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
examiner	technician	M:0.2	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
examiner	students	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
examiner	book	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
examiner	conference	M:0.13	H:1.0	L:0.0	L:0.0	L:0.0	L:0.0
examiner	paper	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
examiner	exam	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
examiner	external examiner	H:0.25	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
examiner	thesis	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
examiner	supervisor	H:0.25	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
examiner	report	L:0.0	L:0.0	H:0.5	L:0.0	L:0.0	L:0.0
examiner	computer	H:0.5	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0

examiner	micro	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
examiner	mini	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
examiner	main frame	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
examiner	computer officer	M:0.2	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
examiner	sponsor	H:0.25	H:1.0	L:0.0	L:0.0	L:0.0	L:0.0
examiner	project	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
examiner	researcher	H:0.5	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
examiner	machines	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
examiner	advertisement	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
examiner	person	M:0.2	H:1.0	L:0.0	L:0.0	L:0.0	L:0.0
examiner	form	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
examiner	accepted candidate	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
examiner	technical report	L:0.0	L:0.0	H:0.5	L:0.0	L:0.0	L:0.0
examiner	research student	H:0.33	H:1.0	H:0.5	H:0.41	H:0.4	H:0.49
examiner	secretary	H:0.25	H:1.0	L:0.0	L:0.0	L:0.0	L:0.0
examiner	document	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
examiner	class room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
examiner	subjects	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
examiner	Lab.	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
examiner	demonstrator	H:0.25	H:1.0	L:0.0	L:0.0	L:0.0	L:0.0
examiner	degree	M:0.14	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
examiner	speaker	M:0.17	H:1.0	L:0.0	L:0.0	L:0.0	L:0.0
examiner	seminar	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
examiner	graduation	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
report	department	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
report	head	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
report	secretaries	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
report	staff	L:0.0	L:0.0	M:0.17	L:0.0	L:0.0	L:0.0
report	room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
report	course	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
report	student	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
report	lecturer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
report	subject	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
report	equipment	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
report	technician	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
report	students	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
report	book	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
report	conference	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
report	paper	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
report	exam	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
report	external examiner	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
report	thesis	M:0.2	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
report	supervisor	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
report	examiner	L:0.0	L:0.0	H:0.5	L:0.0	L:0.0	L:0.0
report	computer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
report	micro	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
report	mini	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
report	main frame	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
report	computer officer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
report	sponsor	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
report	project	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
report	researcher	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
report	machines	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
report	advertisement	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
report	person	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
report	form	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
report	accepted candidate	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
report	technical report	L:0.0	L:0.0	H:1.0	L:0.0	L:0.0	L:0.0
report	research student	L:0.0	L:0.0	H:1.0	L:0.0	L:0.0	L:0.0
report	secretary	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
report	document	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
report	class room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
report	subjects	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0

report	Lab.	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
report	demonstrator	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
report	degree	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
report	speaker	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
report	seminar	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
report	graduation	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
computer	department	M:0.2	M:0.25	L:0.0	L:0.0	L:0.0	L:0.0
computer	head	H:0.25	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
computer	secretaries	M:0.2	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
computer	staff	M:0.14	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
computer	room	L:0.0	L:0.0	M:0.2	L:0.0	L:0.0	L:0.0
computer	course	H:0.33	H:0.669	M:0.13	H:0.21	H:0.29	M:0.18
computer	student	M:0.14	L:0.0	M:0.069	M:0.1	L:0.0	L:0.0
computer	lecturer	H:0.4	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
computer	subject	M:0.2	M:0.25	L:0.0	L:0.0	L:0.0	L:0.0
computer	equipment	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
computer	technician	M:0.2	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
computer	students	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
computer	book	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
computer	conference	M:0.13	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
computer	paper	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
computer	exam	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
computer	external examiner	H:0.25	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
computer	thesis	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
computer	supervisor	H:0.25	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
computer	examiner	H:0.5	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
computer	report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
computer	micro	L:0.0	L:0.0	M:0.25	L:0.0	L:0.0	L:0.0
computer	mini	L:0.0	L:0.0	M:0.25	L:0.0	L:0.0	L:0.0
computer	main frame	L:0.0	L:0.0	M:0.25	L:0.0	L:0.0	L:0.0
computer	computer officer	M:0.2	M:0.33	M:0.25	H:0.22	M:0.22	M:0.25
computer	sponsor	H:0.25	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
computer	project	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
computer	researcher	H:0.5	H:1.0	L:0.0	L:0.0	L:0.0	L:0.0
computer	machines	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
computer	advertisement	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
computer	person	M:0.2	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
computer	form	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
computer	accepted candidate	L:0.0	L:0.0	M:0.2	L:0.0	L:0.0	L:0.0
computer	technical report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
computer	research student	H:0.33	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
computer	secretary	H:0.25	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
computer	document	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
computer	class room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
computer	subjects	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
computer	Lab.	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
computer	demonstrator	H:0.25	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
computer	degree	M:0.14	M:0.25	L:0.0	L:0.0	L:0.0	L:0.0
computer	speaker	M:0.17	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
computer	seminar	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
computer	graduation	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
micro	department	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
micro	head	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
micro	secretaries	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
micro	staff	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
micro	room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
micro	course	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
micro	student	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
micro	lecturer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
micro	subject	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
micro	equipment	M:0.2	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
micro	technician	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
micro	students	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0

micro	book	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
micro	conference	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
micro	paper	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
micro	exam	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
micro	external examiner	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
micro	thesis	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
micro	supervisor	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
micro	examiner	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
micro	report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
micro	computer	L:0.0	L:0.0	M:0.25	L:0.0	L:0.0	L:0.0
micro	mini	H:1.0	H:1.0	H:1.0	H:1.0	H:1.0	H:1.0
micro	main frame	H:0.25	H:0.5	H:1.0	H:0.5	H:0.35	H:0.709
micro	computer officer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
micro	sponsor	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
micro	project	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
micro	researcher	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
micro	machines	M:0.17	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
micro	advertisement	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
micro	person	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
micro	form	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
micro	accepted candidate	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
micro	technical report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
micro	research student	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
micro	secretary	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
micro	document	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
micro	class room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
micro	subjects	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
micro	Lab.	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
micro	demonstrator	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
micro	degree	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
micro	speaker	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
micro	seminar	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
micro	graduation	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
mini	department	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
mini	head	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
mini	secretaries	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
mini	staff	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
mini	room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
mini	course	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
mini	student	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
mini	lecturer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
mini	subject	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
mini	equipment	M:0.2	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
mini	technician	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
mini	students	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
mini	book	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
mini	conference	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
mini	paper	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
mini	exam	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
mini	external examiner	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
mini	thesis	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
mini	supervisor	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
mini	examiner	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
mini	report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
mini	computer	L:0.0	L:0.0	M:0.25	L:0.0	L:0.0	L:0.0
mini	micro	H:1.0	H:1.0	H:1.0	H:1.0	H:1.0	H:1.0
mini	main frame	H:0.25	H:0.5	H:1.0	H:0.5	H:0.35	H:0.709
mini	computer officer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
mini	sponsor	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
mini	project	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
mini	researcher	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
mini	machines	M:0.17	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
mini	advertisement	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0

mini	person	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
mini	form	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
mini	accepted candidate	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
mini	technical report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
mini	research student	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
mini	secretary	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
mini	document	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
mini	class room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
mini	subjects	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
mini	Lab.	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
mini	demonstrator	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
mini	degree	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
mini	speaker	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
mini	seminar	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
mini	graduation	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
main frame	department	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
main frame	head	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
main frame	secretaries	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
main frame	staff	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
main frame	room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
main frame	course	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
main frame	student	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
main frame	lecturer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
main frame	subject	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
main frame	equipment	H:0.25	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
main frame	technician	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
main frame	students	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
main frame	book	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
main frame	conference	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
main frame	paper	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
main frame	exam	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
main frame	external examiner	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
main frame	thesis	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
main frame	supervisor	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
main frame	examiner	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
main frame	report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
main frame	computer	L:0.0	L:0.0	M:0.25	L:0.0	L:0.0	L:0.0
main frame	micro	H:0.25	H:0.5	H:1.0	H:0.5	H:0.35	H:0.709
main frame	mini	H:0.25	H:0.5	H:1.0	H:0.5	H:0.35	H:0.709
main frame	computer officer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
main frame	sponsor	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
main frame	project	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
main frame	researcher	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
main frame	machines	M:0.2	H:1.0	L:0.0	L:0.0	L:0.0	L:0.0
main frame	advertisement	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
main frame	person	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
main frame	form	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
main frame	accepted candidate	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
main frame	technical report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
main frame	research student	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
main frame	secretary	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
main frame	document	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
main frame	class room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
main frame	subjects	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
main frame	Lab.	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
main frame	demonstrator	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
main frame	degree	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
main frame	speaker	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
main frame	seminar	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
main frame	graduation	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
computer officer	department	M:0.2	M:0.25	L:0.0	L:0.0	L:0.0	L:0.0
computer officer	head	H:0.25	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
computer officer	secretaries	H:0.5	H:1.0	L:0.0	L:0.0	L:0.0	L:0.0

computer officer	staff	M:0.14	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
computer officer	room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
computer officer	course	M:0.14	M:0.25	L:0.0	L:0.0	L:0.0	L:0.0
computer officer	student	M:0.14	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
computer officer	lecturer	M:0.17	M:0.2	L:0.0	L:0.0	L:0.0	L:0.0
computer officer	subject	M:0.2	M:0.25	L:0.0	L:0.0	L:0.0	L:0.0
computer officer	equipment	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
computer officer	technician	H:0.5	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
computer officer	students	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
computer officer	book	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
computer officer	conference	M:0.13	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
computer officer	paper	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
computer officer	exam	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
computer officer	external examiner	H:0.25	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
computer officer	thesis	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
computer officer	supervisor	H:0.25	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
computer officer	examiner	M:0.2	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
computer officer	report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
computer officer	computer	M:0.2	M:0.33	M:0.25	H:0.22	M:0.22	M:0.25
computer officer	micro	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
computer officer	mini	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
computer officer	main frame	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
computer officer	sponsor	H:0.25	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
computer officer	project	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
computer officer	researcher	M:0.2	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
computer officer	machines	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
computer officer	advertisement	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
computer officer	person	M:0.2	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
computer officer	form	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
computer officer	accepted candidate	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
computer officer	technical report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
computer officer	research student	H:0.33	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
computer officer	secretary	H:0.25	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
computer officer	document	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
computer officer	class room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
computer officer	subjects	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
computer officer	Lab.	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
computer officer	demonstrator	H:0.25	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
computer officer	degree	M:0.14	M:0.25	L:0.0	L:0.0	L:0.0	L:0.0
computer officer	speaker	M:0.17	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
computer officer	seminar	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
computer officer	graduation	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
sponsor	department	H:0.25	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
sponsor	head	H:0.33	H:1.0	L:0.0	L:0.0	L:0.0	L:0.0
sponsor	secretaries	H:0.25	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
sponsor	staff	M:0.17	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
sponsor	room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
sponsor	course	M:0.17	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
sponsor	student	M:0.17	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
sponsor	lecturer	M:0.2	M:0.25	L:0.0	L:0.0	L:0.0	L:0.0
sponsor	subject	H:0.25	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
sponsor	equipment	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
sponsor	technician	H:0.25	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
sponsor	students	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
sponsor	book	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
sponsor	conference	M:0.14	H:1.0	L:0.0	L:0.0	L:0.0	L:0.0
sponsor	paper	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
sponsor	exam	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
sponsor	external examiner	H:0.33	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
sponsor	thesis	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
sponsor	supervisor	H:0.33	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
sponsor	examiner	H:0.25	H:1.0	L:0.0	L:0.0	L:0.0	L:0.0
sponsor	report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0

sponsor	computer	H:0.25	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
sponsor	micro	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
sponsor	mini	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
sponsor	main frame	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
sponsor	computer officer	H:0.25	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
sponsor	project	L:0.0	L:0.0	M:0.11	L:0.0	L:0.0	L:0.0
sponsor	researcher	H:0.25	H:0.5	H:0.4	H:0.32	H:0.29	H:0.37
sponsor	machines	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
sponsor	advertisement	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
sponsor	person	H:0.25	H:1.0	L:0.0	L:0.0	L:0.0	L:0.0
sponsor	form	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
sponsor	accepted candidate	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
sponsor	technical report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
sponsor	research student	H:0.5	H:1.0	L:0.0	L:0.0	L:0.0	L:0.0
sponsor	secretary	H:0.33	H:1.0	L:0.0	L:0.0	L:0.0	L:0.0
sponsor	document	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
sponsor	class room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
sponsor	subjects	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
sponsor	Lab.	L:0.0	L:0.0	M:0.25	L:0.0	L:0.0	L:0.0
sponsor	demonstrator	H:0.33	H:1.0	H:0.33	H:0.33	H:0.37	H:0.37
sponsor	degree	M:0.17	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
sponsor	speaker	M:0.2	H:1.0	L:0.0	L:0.0	L:0.0	L:0.0
sponsor	seminar	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
sponsor	graduation	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
project	department	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
project	head	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
project	secretaries	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
project	staff	H:0.22	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
project	room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
project	course	M:0.1	M:0.25	L:0.0	L:0.0	L:0.0	L:0.0
project	student	M:0.1	L:0.0	M:0.059	M:0.079	L:0.0	L:0.0
project	lecturer	M:0.11	M:0.2	M:0.15	M:0.13	M:0.12	M:0.15
project	subject	M:0.13	M:0.25	L:0.0	L:0.0	L:0.0	L:0.0
project	equipment	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
project	technician	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
project	students	M:0.11	M:0.2	L:0.0	L:0.0	L:0.0	L:0.0
project	book	M:0.1	M:0.17	L:0.0	L:0.0	L:0.0	L:0.0
project	conference	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
project	paper	M:0.14	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
project	exam	M:0.13	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
project	external examiner	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
project	thesis	M:0.14	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
project	supervisor	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
project	examiner	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
project	report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
project	computer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
project	micro	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
project	mini	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
project	main frame	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
project	computer officer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
project	sponsor	L:0.0	L:0.0	M:0.11	L:0.0	L:0.0	L:0.0
project	researcher	M:0.13	L:0.0	M:0.1	M:0.11	L:0.0	L:0.0
project	machines	M:0.11	L:0.0	M:0.13	M:0.12	L:0.0	L:0.0
project	advertisement	M:0.1	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
project	person	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
project	form	M:0.1	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
project	accepted candidate	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
project	technical report	M:0.089	M:0.25	L:0.0	L:0.0	L:0.0	L:0.0
project	research student	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
project	secretary	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
project	document	M:0.14	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
project	class room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
project	subjects	M:0.17	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0

project	Lab.	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
project	demonstrator	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
project	degree	H:0.22	M:0.25	M:0.11	M:0.16	M:0.19	M:0.14
project	speaker	M:0.11	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
project	seminar	M:0.079	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
project	graduation	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
researcher	department	M:0.2	M:0.25	L:0.0	L:0.0	L:0.0	L:0.0
researcher	head	H:0.25	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
researcher	secretaries	M:0.2	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
researcher	staff	H:0.33	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
researcher	room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
researcher	course	H:0.33	H:0.669	L:0.0	L:0.0	L:0.0	L:0.0
researcher	student	M:0.14	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
researcher	lecturer	H:0.4	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
researcher	subject	M:0.2	M:0.25	L:0.0	L:0.0	L:0.0	L:0.0
researcher	equipment	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
researcher	technician	M:0.2	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
researcher	students	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
researcher	book	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
researcher	conference	M:0.13	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
researcher	paper	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
researcher	exam	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
researcher	external examiner	H:0.25	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
researcher	thesis	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
researcher	supervisor	H:0.25	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
researcher	examiner	H:0.5	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
researcher	report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
researcher	computer	H:0.5	H:1.0	L:0.0	L:0.0	L:0.0	L:0.0
researcher	micro	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
researcher	mini	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
researcher	main frame	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
researcher	computer officer	M:0.2	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
researcher	sponsor	H:0.25	H:0.5	H:0.4	H:0.32	H:0.29	H:0.37
researcher	project	M:0.13	L:0.0	M:0.1	M:0.11	L:0.0	L:0.0
researcher	machines	M:0.17	L:0.0	M:0.2	M:0.18	L:0.0	L:0.0
researcher	advertisement	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
researcher	person	M:0.2	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
researcher	form	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
researcher	accepted candidate	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
researcher	technical report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
researcher	research student	H:0.33	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
researcher	secretary	H:0.25	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
researcher	document	H:0.25	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
researcher	class room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
researcher	subjects	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
researcher	Lab.	L:0.0	L:0.0	M:0.2	L:0.0	L:0.0	L:0.0
researcher	demonstrator	H:0.25	H:0.5	M:0.25	H:0.25	H:0.27	M:0.27
researcher	degree	H:0.33	M:0.25	L:0.0	L:0.0	L:0.0	L:0.0
researcher	speaker	H:0.4	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
researcher	seminar	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
researcher	graduation	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
machines	department	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
machines	head	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
machines	secretaries	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
machines	staff	M:0.13	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
machines	room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
machines	course	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
machines	student	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
machines	lecturer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
machines	subject	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
machines	equipment	M:0.17	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
machines	technician	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
machines	students	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0

machines	book	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
machines	conference	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
machines	paper	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
machines	exam	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
machines	external examiner	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
machines	thesis	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
machines	supervisor	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
machines	examiner	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
machines	report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
machines	computer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
machines	micro	M:0.17	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
machines	mini	M:0.17	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
machines	main frame	M:0.2	H:1.0	L:0.0	L:0.0	L:0.0	L:0.0
machines	computer officer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
machines	sponsor	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
machines	project	M:0.11	L:0.0	M:0.13	M:0.12	L:0.0	L:0.0
machines	researcher	M:0.17	L:0.0	M:0.2	M:0.18	L:0.0	L:0.0
machines	advertisement	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
machines	person	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
machines	form	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
machines	accepted candidate	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
machines	technical report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
machines	research student	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
machines	secretary	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
machines	document	M:0.2	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
machines	class room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
machines	subjects	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
machines	Lab.	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
machines	demonstrator	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
machines	degree	M:0.13	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
machines	speaker	M:0.14	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
machines	seminar	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
machines	graduation	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
advertisement	department	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
advertisement	head	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
advertisement	secretaries	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
advertisement	staff	M:0.11	L:0.0	M:0.17	M:0.14	L:0.0	L:0.0
advertisement	room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
advertisement	course	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
advertisement	student	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
advertisement	lecturer	M:0.13	M:0.25	L:0.0	L:0.0	L:0.0	L:0.0
advertisement	subject	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
advertisement	equipment	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
advertisement	technician	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
advertisement	students	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
advertisement	book	M:0.11	M:0.2	L:0.0	L:0.0	L:0.0	L:0.0
advertisement	conference	M:0.1	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
advertisement	paper	M:0.17	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
advertisement	exam	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
advertisement	external examiner	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
advertisement	thesis	M:0.17	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
advertisement	supervisor	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
advertisement	examiner	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
advertisement	report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
advertisement	computer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
advertisement	micro	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
advertisement	mini	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
advertisement	main frame	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
advertisement	computer officer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
advertisement	sponsor	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
advertisement	project	M:0.1	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
advertisement	researcher	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
advertisement	machines	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0

advertisement	person	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
advertisement	form	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
advertisement	accepted candidate	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
advertisement	technical report	M:0.1	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
advertisement	research student	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
advertisement	secretary	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
advertisement	document	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
advertisement	class room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
advertisement	subjects	M:0.2	H:1.0	L:0.0	L:0.0	L:0.0	L:0.0
advertisement	Lab.	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
advertisement	demonstrator	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
advertisement	degree	M:0.11	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
advertisement	speaker	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
advertisement	seminar	M:0.2	H:1.0	L:0.0	L:0.0	L:0.0	L:0.0
advertisement	graduation	M:0.14	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
person	department	M:0.2	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
person	head	H:0.25	H:1.0	L:0.0	L:0.0	L:0.0	L:0.0
person	secretaries	M:0.2	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
person	staff	M:0.14	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
person	room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
person	course	M:0.14	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
person	student	M:0.14	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
person	lecturer	M:0.17	M:0.25	L:0.0	L:0.0	L:0.0	L:0.0
person	subject	M:0.2	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
person	equipment	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
person	technician	M:0.2	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
person	students	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
person	book	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
person	conference	M:0.13	H:1.0	L:0.0	L:0.0	L:0.0	L:0.0
person	paper	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
person	exam	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
person	external examiner	H:0.669	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
person	thesis	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
person	supervisor	H:0.25	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
person	examiner	M:0.2	H:1.0	L:0.0	L:0.0	L:0.0	L:0.0
person	report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
person	computer	M:0.2	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
person	micro	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
person	mini	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
person	main frame	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
person	computer officer	M:0.2	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
person	sponsor	H:0.25	H:1.0	L:0.0	L:0.0	L:0.0	L:0.0
person	project	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
person	researcher	M:0.2	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
person	machines	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
person	advertisement	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
person	form	L:0.0	L:0.0	M:0.25	L:0.0	L:0.0	L:0.0
person	accepted candidate	L:0.0	L:0.0	M:0.25	L:0.0	L:0.0	L:0.0
person	technical report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
person	research student	H:0.33	H:1.0	L:0.0	L:0.0	L:0.0	L:0.0
person	secretary	H:0.25	H:1.0	L:0.0	L:0.0	L:0.0	L:0.0
person	document	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
person	class room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
person	subjects	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
person	Lab.	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
person	demonstrator	H:0.25	H:1.0	L:0.0	L:0.0	L:0.0	L:0.0
person	degree	M:0.14	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
person	speaker	M:0.17	H:1.0	L:0.0	L:0.0	L:0.0	L:0.0
person	seminar	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
person	graduation	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
form	department	M:0.14	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
form	head	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
form	secretaries	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0

form	staff	M:0.11	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
form	room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
form	course	M:0.11	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
form	student	M:0.11	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
form	lecturer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
form	subject	M:0.14	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
form	equipment	M:0.14	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
form	technician	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
form	students	M:0.13	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
form	book	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
form	conference	M:0.1	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
form	paper	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
form	exam	H:0.33	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
form	external examiner	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
form	thesis	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
form	supervisor	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
form	examiner	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
form	report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
form	computer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
form	micro	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
form	mini	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
form	main frame	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
form	computer officer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
form	sponsor	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
form	project	M:0.1	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
form	researcher	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
form	machines	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
form	advertisement	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
form	person	L:0.0	L:0.0	M:0.25	L:0.0	L:0.0	L:0.0
form	accepted candidate	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
form	technical report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
form	research student	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
form	secretary	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
form	document	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
form	class room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
form	subjects	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
form	Lab.	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
form	demonstrator	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
form	degree	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
form	speaker	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
form	seminar	M:0.089	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
form	graduation	M:0.14	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
accepted candidate	department	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
accepted candidate	head	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
accepted candidate	secretaries	M:0.2	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
accepted candidate	staff	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
accepted candidate	room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
accepted candidate	course	L:0.0	L:0.0	M:0.17	L:0.0	L:0.0	L:0.0
accepted candidate	student	L:0.0	L:0.0	M:0.079	L:0.0	L:0.0	L:0.0
accepted candidate	lecturer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
accepted candidate	subject	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
accepted candidate	equipment	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
accepted candidate	technician	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
accepted candidate	students	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
accepted candidate	book	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
accepted candidate	conference	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
accepted candidate	paper	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
accepted candidate	exam	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
accepted candidate	external examiner	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
accepted candidate	thesis	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
accepted candidate	supervisor	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
accepted candidate	examiner	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
accepted candidate	report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0

accepted candidate	computer	L:0.0	L:0.0	M:0.2	L:0.0	L:0.0	L:0.0
accepted candidate	micro	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
accepted candidate	mini	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
accepted candidate	main frame	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
accepted candidate	computer officer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
accepted candidate	sponsor	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
accepted candidate	project	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
accepted candidate	researcher	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
accepted candidate	machines	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
accepted candidate	advertisement	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
accepted candidate	person	L:0.0	L:0.0	M:0.25	L:0.0	L:0.0	L:0.0
accepted candidate	form	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
accepted candidate	technical report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
accepted candidate	research student	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
accepted candidate	secretary	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
accepted candidate	document	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
accepted candidate	class room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
accepted candidate	subjects	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
accepted candidate	Lab.	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
accepted candidate	demonstrator	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
accepted candidate	degree	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
accepted candidate	speaker	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
accepted candidate	seminar	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
accepted candidate	graduation	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
technical report	department	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
technical report	head	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
technical report	secretaries	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
technical report	staff	M:0.1	L:0.0	M:0.17	M:0.13	L:0.0	L:0.0
technical report	room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
technical report	course	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
technical report	student	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
technical report	lecturer	M:0.11	M:0.17	L:0.0	L:0.0	L:0.0	L:0.0
technical report	subject	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
technical report	equipment	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
technical report	technician	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
technical report	students	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
technical report	book	H:0.22	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
technical report	conference	M:0.089	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
technical report	paper	H:0.33	H:0.669	L:0.0	L:0.0	L:0.0	L:0.0
technical report	exam	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
technical report	external examiner	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
technical report	thesis	M:0.14	M:0.25	L:0.0	L:0.0	L:0.0	L:0.0
technical report	supervisor	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
technical report	examiner	L:0.0	L:0.0	H:0.5	L:0.0	L:0.0	L:0.0
technical report	report	L:0.0	L:0.0	H:1.0	L:0.0	L:0.0	L:0.0
technical report	computer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
technical report	micro	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
technical report	mini	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
technical report	main frame	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
technical report	computer officer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
technical report	sponsor	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
technical report	project	M:0.089	M:0.25	L:0.0	L:0.0	L:0.0	L:0.0
technical report	researcher	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
technical report	machines	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
technical report	advertisement	M:0.1	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
technical report	person	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
technical report	form	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
technical report	accepted candidate	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
technical report	research student	L:0.0	L:0.0	H:1.0	L:0.0	L:0.0	L:0.0
technical report	secretary	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
technical report	document	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
technical report	class room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
technical report	subjects	M:0.17	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0

technical report	Lab.	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
technical report	demonstrator	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
technical report	degree	M:0.1	M:0.2	L:0.0	L:0.0	L:0.0	L:0.0
technical report	speaker	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
technical report	seminar	M:0.079	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
technical report	graduation	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
research student	department	H:0.33	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
research student	head	H:0.5	H:1.0	L:0.0	L:0.0	L:0.0	L:0.0
research student	secretaries	H:0.33	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
research student	staff	M:0.2	H:0.5	M:0.17	M:0.18	M:0.21	M:0.2
research student	room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
research student	course	M:0.2	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
research student	student	M:0.2	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
research student	lecturer	H:0.25	M:0.25	L:0.0	L:0.0	L:0.0	L:0.0
research student	subject	H:0.33	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
research student	equipment	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
research student	technician	H:0.33	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
research student	students	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
research student	book	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
research student	conference	M:0.17	H:1.0	L:0.0	L:0.0	L:0.0	L:0.0
research student	paper	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
research student	exam	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
research student	external examiner	H:0.5	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
research student	thesis	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
research student	supervisor	H:0.5	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
research student	examiner	H:0.33	H:1.0	H:0.5	H:0.41	H:0.4	H:0.49
research student	report	L:0.0	L:0.0	H:1.0	L:0.0	L:0.0	L:0.0
research student	computer	H:0.33	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
research student	micro	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
research student	mini	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
research student	main frame	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
research student	computer officer	H:0.33	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
research student	sponsor	H:0.5	H:1.0	L:0.0	L:0.0	L:0.0	L:0.0
research student	project	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
research student	researcher	H:0.33	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
research student	machines	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
research student	advertisement	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
research student	person	H:0.33	H:1.0	L:0.0	L:0.0	L:0.0	L:0.0
research student	form	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
research student	accepted candidate	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
research student	technical report	L:0.0	L:0.0	H:1.0	L:0.0	L:0.0	L:0.0
research student	secretary	H:0.5	H:1.0	L:0.0	L:0.0	L:0.0	L:0.0
research student	document	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
research student	class room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
research student	subjects	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
research student	Lab.	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
research student	demonstrator	H:0.5	H:1.0	L:0.0	L:0.0	L:0.0	L:0.0
research student	degree	M:0.2	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
research student	speaker	H:0.25	H:1.0	L:0.0	L:0.0	L:0.0	L:0.0
research student	seminar	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
research student	graduation	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
secretary	department	H:0.25	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
secretary	head	H:0.33	H:1.0	L:0.0	L:0.0	L:0.0	L:0.0
secretary	secretaries	H:0.25	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
secretary	staff	M:0.17	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
secretary	room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
secretary	course	M:0.17	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
secretary	student	M:0.17	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
secretary	lecturer	M:0.2	M:0.25	L:0.0	L:0.0	L:0.0	L:0.0
secretary	subject	H:0.25	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
secretary	equipment	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
secretary	technician	H:0.25	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
secretary	students	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0

secretary	book	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
secretary	conference	M:0.14	H:1.0	L:0.0	L:0.0	L:0.0	L:0.0
secretary	paper	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
secretary	exam	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
secretary	external examiner	H:0.33	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
secretary	thesis	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
secretary	supervisor	H:0.33	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
secretary	examiner	H:0.25	H:1.0	L:0.0	L:0.0	L:0.0	L:0.0
secretary	report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
secretary	computer	H:0.25	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
secretary	micro	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
secretary	mini	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
secretary	main frame	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
secretary	computer officer	H:0.25	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
secretary	sponsor	H:0.33	H:1.0	L:0.0	L:0.0	L:0.0	L:0.0
secretary	project	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
secretary	researcher	H:0.25	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
secretary	machines	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
secretary	advertisement	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
secretary	person	H:0.25	H:1.0	L:0.0	L:0.0	L:0.0	L:0.0
secretary	form	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
secretary	accepted candidate	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
secretary	technical report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
secretary	research student	H:0.5	H:1.0	L:0.0	L:0.0	L:0.0	L:0.0
secretary	document	L:0.0	L:0.0	H:1.0	L:0.0	L:0.0	L:0.0
secretary	class room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
secretary	subjects	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
secretary	Lab.	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
secretary	demonstrator	H:0.33	H:1.0	L:0.0	L:0.0	L:0.0	L:0.0
secretary	degree	M:0.17	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
secretary	speaker	M:0.2	H:1.0	L:0.0	L:0.0	L:0.0	L:0.0
secretary	seminar	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
secretary	graduation	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
document	department	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
document	head	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
document	secretaries	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
document	staff	M:0.17	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
document	room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
document	course	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
document	student	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
document	lecturer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
document	subject	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
document	equipment	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
document	technician	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
document	students	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
document	book	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
document	conference	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
document	paper	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
document	exam	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
document	external examiner	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
document	thesis	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
document	supervisor	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
document	examiner	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
document	report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
document	computer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
document	micro	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
document	mini	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
document	main frame	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
document	computer officer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
document	sponsor	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
document	project	M:0.14	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
document	researcher	H:0.25	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
document	machines	M:0.2	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0

document	advertisement	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
document	person	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
document	form	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
document	accepted candidate	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
document	technical report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
document	research student	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
document	secretary	L:0.0	L:0.0	H:1.0	L:0.0	L:0.0	L:0.0
document	class room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
document	subjects	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
document	Lab.	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
document	demonstrator	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
document	degree	M:0.17	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
document	speaker	M:0.2	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
document	seminar	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
document	graduation	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
class room	department	L:0.0	L:0.0	M:0.13	L:0.0	L:0.0	L:0.0
class room	head	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
class room	secretaries	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
class room	staff	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
class room	room	H:0.25	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
class room	course	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
class room	student	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
class room	lecturer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
class room	subject	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
class room	equipment	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
class room	technician	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
class room	students	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
class room	book	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
class room	conference	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
class room	paper	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
class room	exam	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
class room	external examiner	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
class room	thesis	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
class room	supervisor	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
class room	examiner	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
class room	report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
class room	computer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
class room	micro	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
class room	mini	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
class room	main frame	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
class room	computer officer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
class room	sponsor	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
class room	project	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
class room	researcher	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
class room	machines	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
class room	advertisement	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
class room	person	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
class room	form	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
class room	accepted candidate	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
class room	technical report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
class room	research student	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
class room	secretary	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
class room	document	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
class room	subjects	L:0.0	L:0.0	M:0.2	L:0.0	L:0.0	L:0.0
class room	Lab.	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
class room	demonstrator	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
class room	degree	L:0.0	L:0.0	M:0.25	L:0.0	L:0.0	L:0.0
class room	speaker	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
class room	seminar	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
class room	graduation	L:0.0	L:0.0	H:0.33	L:0.0	L:0.0	L:0.0
subjects	department	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
subjects	head	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
subjects	secretaries	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0

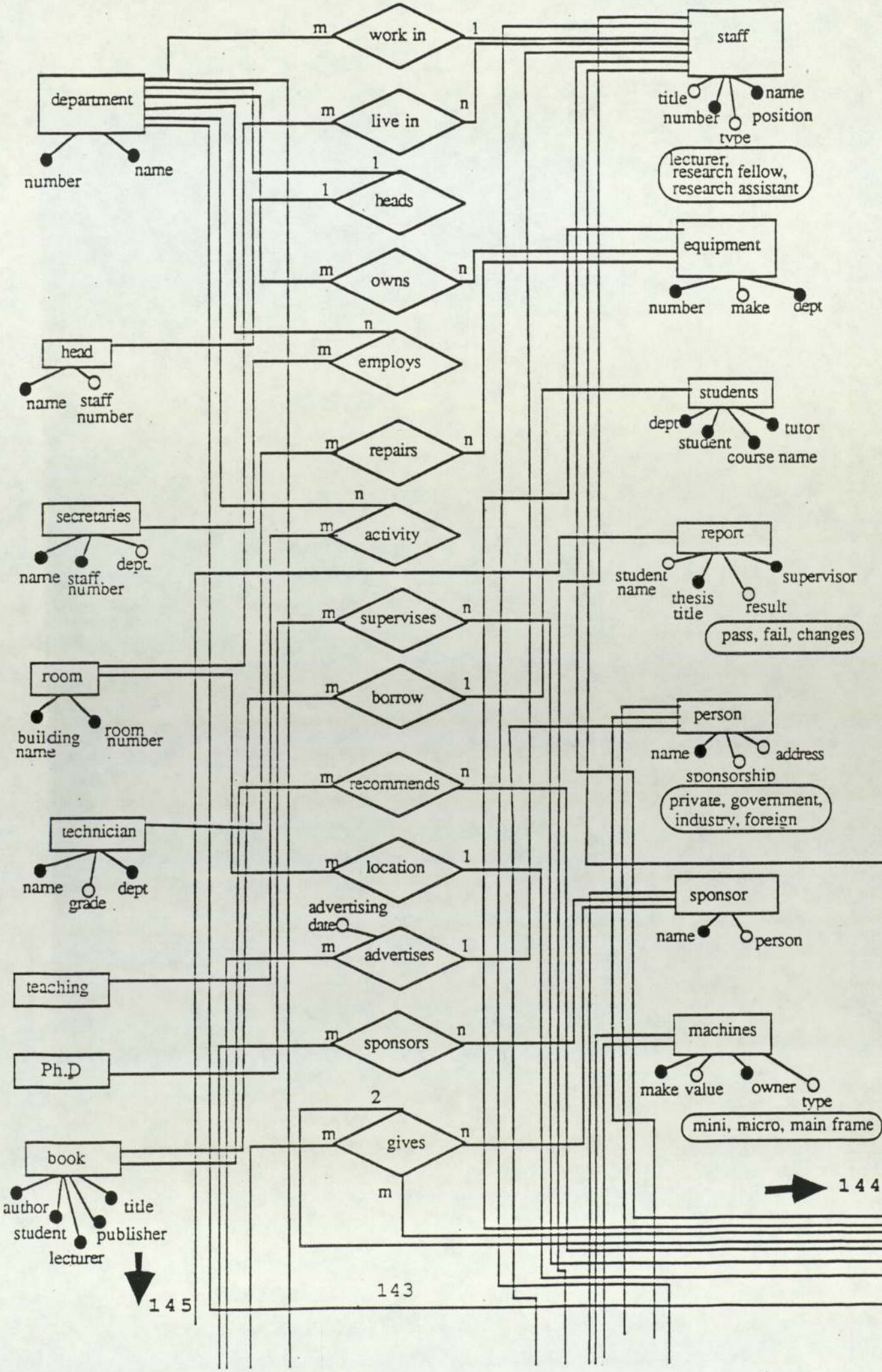
subjects	staff	M:0.2	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
subjects	room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
subjects	course	L:0.0	L:0.0	H:0.29	L:0.0	L:0.0	L:0.0
subjects	student	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
subjects	lecturer	H:0.25	M:0.25	M:0.089	M:0.15	M:0.2	M:0.12
subjects	subject	L:0.0	L:0.0	M:0.2	L:0.0	L:0.0	L:0.0
subjects	equipment	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
subjects	technician	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
subjects	students	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
subjects	book	M:0.2	M:0.2	L:0.0	L:0.0	L:0.0	L:0.0
subjects	conference	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
subjects	paper	H:0.5	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
subjects	exam	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
subjects	external examiner	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
subjects	thesis	H:0.5	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
subjects	supervisor	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
subjects	examiner	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
subjects	report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
subjects	computer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
subjects	micro	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
subjects	mini	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
subjects	main frame	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
subjects	computer officer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
subjects	sponsor	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
subjects	project	M:0.17	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
subjects	researcher	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
subjects	machines	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
subjects	advertisement	M:0.2	H:1.0	L:0.0	L:0.0	L:0.0	L:0.0
subjects	person	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
subjects	form	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
subjects	accepted candidate	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
subjects	technical report	M:0.17	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
subjects	research student	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
subjects	secretary	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
subjects	document	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
subjects	class room	L:0.0	L:0.0	M:0.2	L:0.0	L:0.0	L:0.0
subjects	Lab.	L:0.0	L:0.0	M:0.2	L:0.0	L:0.0	L:0.0
subjects	demonstrator	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
subjects	degree	M:0.2	M:0.33	M:0.17	M:0.18	M:0.2	M:0.19
subjects	speaker	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
subjects	seminar	M:0.14	H:1.0	L:0.0	L:0.0	L:0.0	L:0.0
subjects	graduation	L:0.0	L:0.0	M:0.2	L:0.0	L:0.0	L:0.0
Lab.	department	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
Lab.	head	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
Lab.	secretaries	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
Lab.	staff	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
Lab.	room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
Lab.	course	L:0.0	L:0.0	M:0.17	L:0.0	L:0.0	L:0.0
Lab.	student	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
Lab.	lecturer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
Lab.	subject	L:0.0	L:0.0	H:0.33	L:0.0	L:0.0	L:0.0
Lab.	equipment	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
Lab.	technician	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
Lab.	students	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
Lab.	book	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
Lab.	conference	M:0.14	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
Lab.	paper	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
Lab.	exam	H:0.25	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
Lab.	external examiner	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
Lab.	thesis	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
Lab.	supervisor	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
Lab.	examiner	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
Lab.	report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0

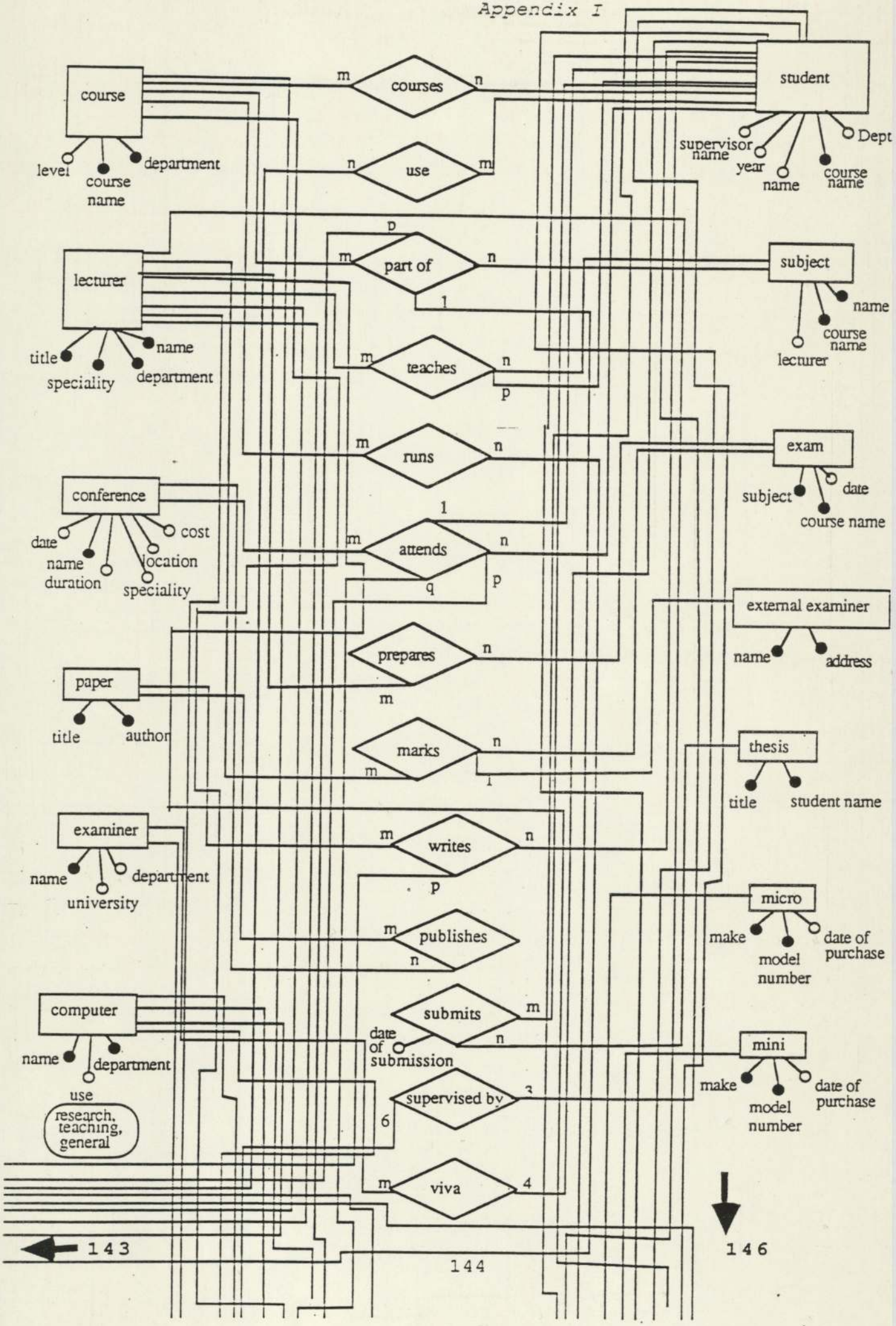
Lab.	computer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
Lab.	micro	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
Lab.	mini	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
Lab.	main frame	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
Lab.	computer officer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
Lab.	sponsor	L:0.0	L:0.0	M:0.25	L:0.0	L:0.0	L:0.0
Lab.	project	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
Lab.	researcher	L:0.0	L:0.0	M:0.2	L:0.0	L:0.0	L:0.0
Lab.	machines	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
Lab.	advertisement	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
Lab.	person	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
Lab.	form	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
Lab.	accepted candidate	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
Lab.	technical report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
Lab.	research student	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
Lab.	secretary	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
Lab.	document	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
Lab.	class room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
Lab.	subjects	L:0.0	L:0.0	M:0.2	L:0.0	L:0.0	L:0.0
Lab.	demonstrator	L:0.0	L:0.0	H:0.5	L:0.0	L:0.0	L:0.0
Lab.	degree	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
Lab.	speaker	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
Lab.	seminar	M:0.13	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
Lab.	graduation	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
demonstrator	department	H:0.25	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
demonstrator	head	H:0.33	H:1.0	L:0.0	L:0.0	L:0.0	L:0.0
demonstrator	secretaries	H:0.25	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
demonstrator	staff	M:0.17	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
demonstrator	room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
demonstrator	course	M:0.17	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
demonstrator	student	M:0.17	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
demonstrator	lecturer	M:0.2	M:0.25	L:0.0	L:0.0	L:0.0	L:0.0
demonstrator	subject	H:0.25	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
demonstrator	equipment	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
demonstrator	technician	H:0.25	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
demonstrator	students	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
demonstrator	book	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
demonstrator	conference	M:0.14	H:1.0	L:0.0	L:0.0	L:0.0	L:0.0
demonstrator	paper	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
demonstrator	exam	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
demonstrator	external examiner	H:0.33	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
demonstrator	thesis	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
demonstrator	supervisor	H:0.33	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
demonstrator	examiner	H:0.25	H:1.0	L:0.0	L:0.0	L:0.0	L:0.0
demonstrator	report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
demonstrator	computer	H:0.25	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
demonstrator	micro	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
demonstrator	mini	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
demonstrator	main frame	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
demonstrator	computer officer	H:0.25	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
demonstrator	sponsor	H:0.33	H:1.0	H:0.33	H:0.33	H:0.37	H:0.37
demonstrator	project	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
demonstrator	researcher	H:0.25	H:0.5	M:0.25	H:0.25	H:0.27	M:0.27
demonstrator	machines	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
demonstrator	advertisement	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
demonstrator	person	H:0.25	H:1.0	L:0.0	L:0.0	L:0.0	L:0.0
demonstrator	form	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
demonstrator	accepted candidate	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
demonstrator	technical report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
demonstrator	research student	H:0.5	H:1.0	L:0.0	L:0.0	L:0.0	L:0.0
demonstrator	secretary	H:0.33	H:1.0	L:0.0	L:0.0	L:0.0	L:0.0
demonstrator	document	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
demonstrator	class room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0

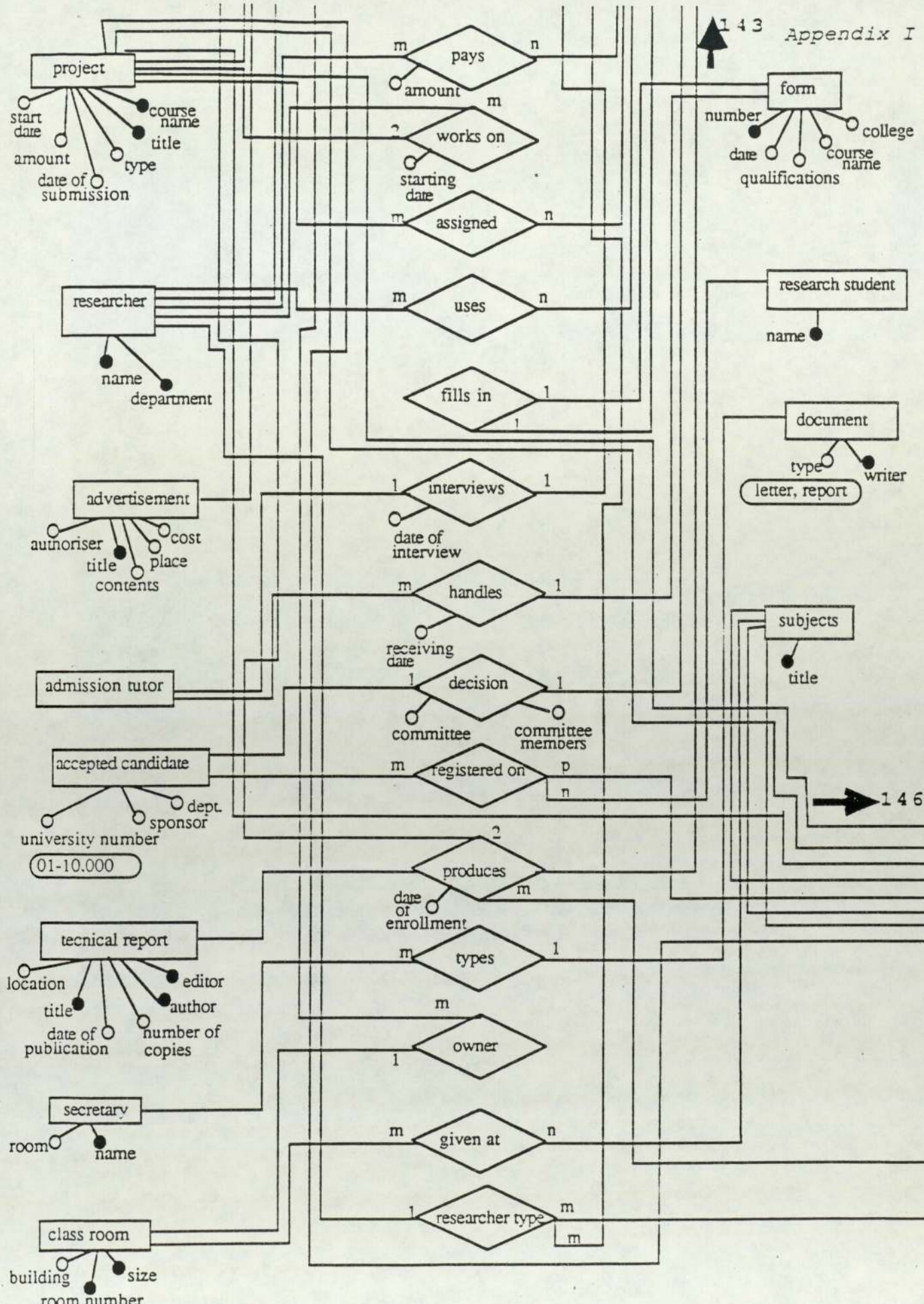
demonstrator	subjects	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
demonstrator	Lab.	L:0.0	L:0.0	H:0.5	L:0.0	L:0.0	L:0.0
demonstrator	degree	M:0.17	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
demonstrator	speaker	M:0.2	H:1.0	L:0.0	L:0.0	L:0.0	L:0.0
demonstrator	seminar	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
demonstrator	graduation	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
degree	department	M:0.14	M:0.2	L:0.0	L:0.0	L:0.0	L:0.0
degree	head	M:0.17	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
degree	secretaries	M:0.14	M:0.25	L:0.0	L:0.0	L:0.0	L:0.0
degree	staff	H:0.43	M:0.25	L:0.0	L:0.0	L:0.0	L:0.0
degree	room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
degree	course	H:0.25	M:0.2	L:0.0	L:0.0	L:0.0	L:0.0
degree	student	H:0.25	L:0.0	M:0.079	M:0.14	L:0.0	L:0.0
degree	lecturer	H:0.29	M:0.4	L:0.0	L:0.0	L:0.0	L:0.0
degree	subject	M:0.14	M:0.2	L:0.0	L:0.0	L:0.0	L:0.0
degree	equipment	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
degree	technician	M:0.14	M:0.25	L:0.0	L:0.0	L:0.0	L:0.0
degree	students	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
degree	book	M:0.11	M:0.14	L:0.0	L:0.0	L:0.0	L:0.0
degree	conference	M:0.1	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
degree	paper	M:0.17	M:0.25	L:0.0	L:0.0	L:0.0	L:0.0
degree	exam	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
degree	external examiner	M:0.17	M:0.25	L:0.0	L:0.0	L:0.0	L:0.0
degree	thesis	M:0.17	M:0.25	L:0.0	L:0.0	L:0.0	L:0.0
degree	supervisor	M:0.17	M:0.25	L:0.0	L:0.0	L:0.0	L:0.0
degree	examiner	M:0.14	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
degree	report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
degree	computer	M:0.14	M:0.25	L:0.0	L:0.0	L:0.0	L:0.0
degree	micro	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
degree	mini	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
degree	main frame	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
degree	computer officer	M:0.14	M:0.25	L:0.0	L:0.0	L:0.0	L:0.0
degree	sponsor	M:0.17	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
degree	project	H:0.22	M:0.25	M:0.11	M:0.16	M:0.19	M:0.14
degree	researcher	H:0.33	M:0.25	L:0.0	L:0.0	L:0.0	L:0.0
degree	machines	M:0.13	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
degree	advertisement	M:0.11	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
degree	person	M:0.14	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
degree	form	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
degree	accepted candidate	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
degree	technical report	M:0.1	M:0.2	L:0.0	L:0.0	L:0.0	L:0.0
degree	research student	M:0.2	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
degree	secretary	M:0.17	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
degree	document	M:0.17	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
degree	class room	L:0.0	L:0.0	M:0.25	L:0.0	L:0.0	L:0.0
degree	subjects	M:0.2	M:0.33	M:0.17	M:0.18	M:0.2	M:0.19
degree	Lab.	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
degree	demonstrator	M:0.17	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
degree	speaker	H:0.29	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
degree	seminar	M:0.089	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
degree	graduation	L:0.0	L:0.0	M:0.25	L:0.0	L:0.0	L:0.0
speaker	department	M:0.17	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
speaker	head	M:0.2	H:1.0	L:0.0	L:0.0	L:0.0	L:0.0
speaker	secretaries	M:0.17	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
speaker	staff	H:0.29	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
speaker	room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
speaker	course	M:0.13	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
speaker	student	M:0.13	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
speaker	lecturer	M:0.14	M:0.25	L:0.0	L:0.0	L:0.0	L:0.0
speaker	subject	M:0.17	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
speaker	equipment	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
speaker	technician	M:0.17	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
speaker	students	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0

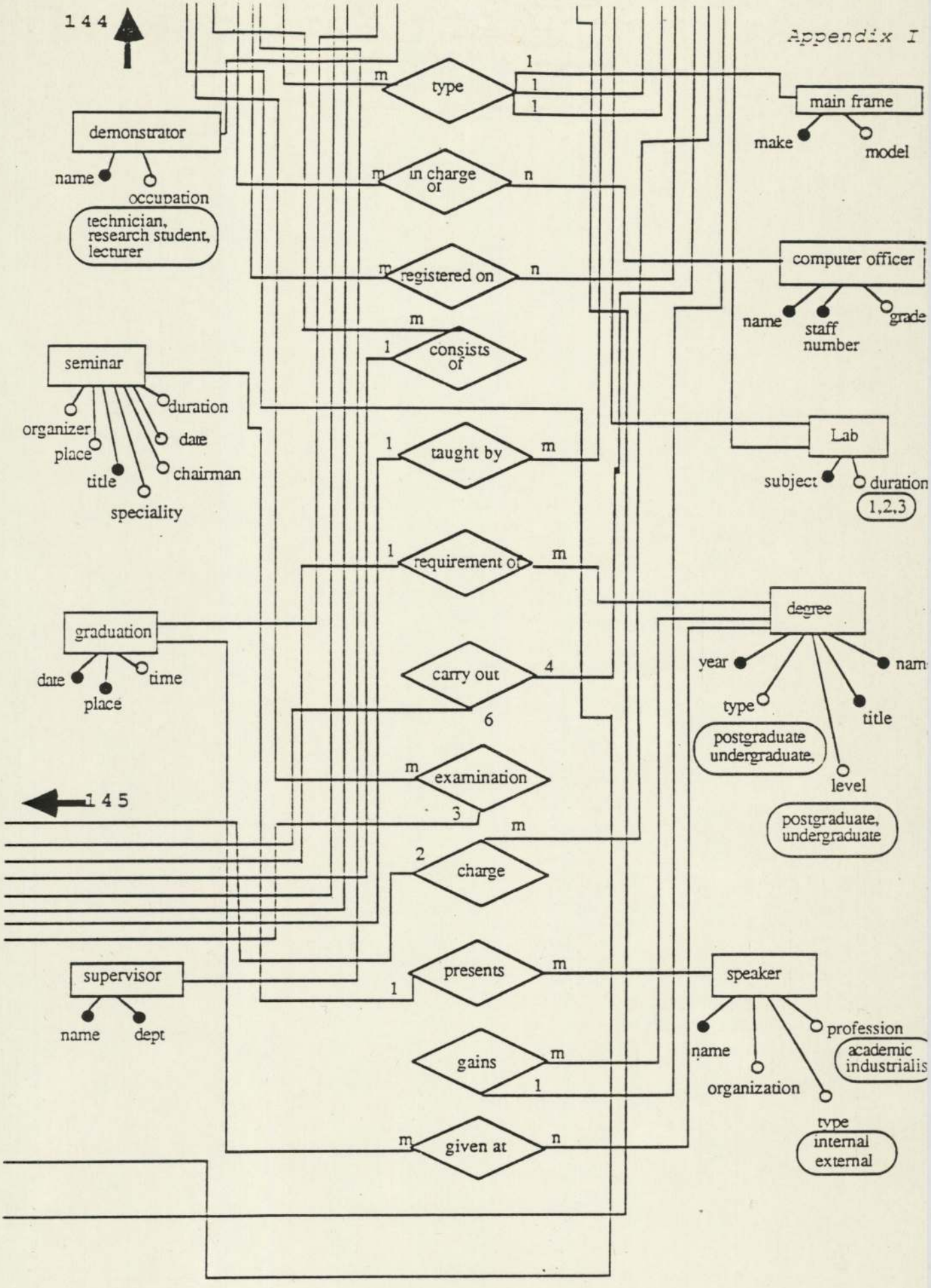
speaker	book	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
speaker	conference	M:0.11	H:1.0	L:0.0	L:0.0	L:0.0	L:0.0
speaker	paper	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
speaker	exam	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
speaker	external examiner	M:0.2	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
speaker	thesis	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
speaker	supervisor	M:0.2	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
speaker	examiner	M:0.17	H:1.0	L:0.0	L:0.0	L:0.0	L:0.0
speaker	report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
speaker	computer	M:0.17	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
speaker	micro	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
speaker	mini	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
speaker	main frame	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
speaker	computer officer	M:0.17	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
speaker	sponsor	M:0.2	H:1.0	L:0.0	L:0.0	L:0.0	L:0.0
speaker	project	M:0.11	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
speaker	researcher	H:0.4	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
speaker	machines	M:0.14	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
speaker	advertisement	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
speaker	person	M:0.17	H:1.0	L:0.0	L:0.0	L:0.0	L:0.0
speaker	form	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
speaker	accepted candidate	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
speaker	technical report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
speaker	research student	H:0.25	H:1.0	L:0.0	L:0.0	L:0.0	L:0.0
speaker	secretary	M:0.2	H:1.0	L:0.0	L:0.0	L:0.0	L:0.0
speaker	document	M:0.2	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
speaker	class room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
speaker	subjects	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
speaker	Lab.	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
speaker	demonstrator	M:0.2	H:1.0	L:0.0	L:0.0	L:0.0	L:0.0
speaker	degree	H:0.29	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
speaker	seminar	L:0.0	L:0.0	H:1.0	L:0.0	L:0.0	L:0.0
speaker	graduation	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
seminar	department	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
seminar	head	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
seminar	secretaries	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
seminar	staff	M:0.089	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
seminar	room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
seminar	course	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
seminar	student	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
seminar	lecturer	H:0.22	M:0.25	L:0.0	L:0.0	L:0.0	L:0.0
seminar	subject	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
seminar	equipment	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
seminar	technician	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
seminar	students	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
seminar	book	M:0.089	M:0.2	L:0.0	L:0.0	L:0.0	L:0.0
seminar	conference	H:0.3	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
seminar	paper	M:0.13	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
seminar	exam	M:0.11	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
seminar	external examiner	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
seminar	thesis	M:0.13	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
seminar	supervisor	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
seminar	examiner	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
seminar	report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
seminar	computer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
seminar	micro	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
seminar	mini	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
seminar	main frame	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
seminar	computer officer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
seminar	sponsor	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
seminar	project	M:0.079	H:0.5	L:0.0	L:0.0	L:0.0	L:0.0
seminar	researcher	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
seminar	machines	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0

seminar	advertisement	M:0.2	H:1.0	L:0.0	L:0.0	L:0.0	L:0.0
seminar	person	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
seminar	form	M:0.089	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
seminar	accepted candidate	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
seminar	technical report	M:0.079	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
seminar	research student	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
seminar	secretary	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
seminar	document	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
seminar	class room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
seminar	subjects	M:0.14	H:1.0	L:0.0	L:0.0	L:0.0	L:0.0
seminar	Lab.	M:0.13	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
seminar	demonstrator	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
seminar	degree	M:0.089	M:0.33	L:0.0	L:0.0	L:0.0	L:0.0
seminar	speaker	L:0.0	L:0.0	H:1.0	L:0.0	L:0.0	L:0.0
seminar	graduation	H:0.25	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
graduation	department	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
graduation	head	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
graduation	secretaries	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
graduation	staff	L:0.0	L:0.0	M:0.14	L:0.0	L:0.0	L:0.0
graduation	room	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
graduation	course	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
graduation	student	L:0.0	L:0.0	M:0.079	L:0.0	L:0.0	L:0.0
graduation	lecturer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
graduation	subject	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
graduation	equipment	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
graduation	technician	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
graduation	students	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
graduation	book	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
graduation	conference	M:0.13	L:0.0	H:0.33	H:0.21	L:0.0	L:0.0
graduation	paper	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
graduation	exam	M:0.2	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
graduation	external examiner	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
graduation	thesis	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
graduation	supervisor	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
graduation	examiner	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
graduation	report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
graduation	computer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
graduation	micro	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
graduation	mini	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
graduation	main frame	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
graduation	computer officer	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
graduation	sponsor	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
graduation	project	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
graduation	researcher	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
graduation	machines	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
graduation	advertisement	M:0.14	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
graduation	person	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
graduation	form	M:0.14	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
graduation	accepted candidate	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
graduation	technical report	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
graduation	research student	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
graduation	secretary	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
graduation	document	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
graduation	class room	L:0.0	L:0.0	H:0.33	L:0.0	L:0.0	L:0.0
graduation	subjects	L:0.0	L:0.0	M:0.2	L:0.0	L:0.0	L:0.0
graduation	Lab.	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
graduation	demonstrator	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
graduation	degree	L:0.0	L:0.0	M:0.25	L:0.0	L:0.0	L:0.0
graduation	speaker	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0
graduation	seminar	H:0.25	L:0.0	L:0.0	L:0.0	L:0.0	L:0.0


work in
staff
department
live in
heads
equipment
owns
employs
head
students
repairs
secretaries
activity
report
supervises
room
borrow
person
recommends
technician
location
sponsor
advertises
teaching
sponsors
machines
Ph.D
gives
book
number
name
title
number
position
type
lecturer, research fellow, research assistant
make
dept
name
staff number
dept
tutor
student
course name
name
staff number
dept
student name
thesis title
supervisor
result
pass, fail, changes
building name
room number
name
address
sponsorship
private, government, industry, foreign
name
grade
dept
advertising date
name
person
make value
owner
type
mini, micro, main frame
author
title
student
publisher
lecturer
144
145
143


course
level
course name
department
courses
use
student
supervisor name
year
name
course name
Dept
lecturer
title
speciality
name
department
part of
teaches
subject
name
course name
lecturer
runs
exam
subject
date
course name
conference
date
name
duration
location
speciality
cost
attends
external examiner
name
address
prepares
paper
title
author
marks
thesis
title
student name
examiner
name
university
department
writes
micro
make
model number
date of purchase
publishes
computer
name
department
use
research, teaching, general
submits
date of submission
mini
make
model number
date of purchase
supervised by
viva
143
144
146


project
start date
course name
amount
title
type
date of submission
pays
m
n
amount
works on
m
2
starting date
assigned
m
n
form
number
college
date
course name
qualifications
researcher
name
department
uses
m
n
research student
name
fills in
1
1
document
type
writer
letter, report
advertisement
authoriser
cost
title
place
contents
interviews
1
1
date of interview
handles
m
1
receiving date
subjects
title
admission tutor
decision
1
1
committee
committee members
accepted candidate
dept.
sponsor
university number
01-10.000
registered on
m
p
n
146
produces
2
m
date of enrollment
tecnical report
location
editor
title
author
date of publication
number of copies
types
m
1
owner
m
1
secretary
room
name
given at
m
n
researcher type
1
m
m
class room
building
size
room number


type
main frame
make
model
demonstrator
name
occupation
technician, research student, lecturer
in charge of
computer officer
name
staff number
grade
registered on
consists of
seminar
organizer
place
title
speciality
duration
date
chairman
Lab
subject
duration
1,2,3
taught by
requirement of
graduation
date
time
place
degree
year
type
postgraduate undergraduate
level
title
carry out
examination
charge
145
supervisor
name
dept
presents
speaker
name
organization
profession
academic industrialis
gains
type
internal external
given at

```
/*                                                                          */
/*      Module : binary vim                                                 */
/*      Notes  : This is the main module ( program ) which carries out the  */
/*                 binary integration process.                              */
/*                 It is based on the E-R matching ( merging )              */
/*                 approach.                                                */
/*                                                                          */



:- use_module(library(lists)).

:- use_module(library(sets)).

:- use_module(library(basics)).
:- use_module(library(math)).



:- dynamic att/2.
:- dynamic ent/2.
:- dynamic ent_att/3.
:- dynamic rel_att/3.



        % these preds (in this case, facts) are defined in multi files.

:- multifile
        att/2,
        ent/2,
        ent_att/3,
        rel/2,
        rel_att/3,
        ent_rel/4,
        view/2.



:- dynamic schema_rels/1.

        % load the dynamic objects
:- [dynamic_objects].

        % load the other bvim modules
:- [bvim_modules].



        % the main predicate to start the binary vim
bvim:-
        ini,        % initialize type of rel mathces counts
                    % this predicate is in rel_matcher module
        choose_view,
        report_rel_match_stats,
        post_int.
bvim.



%       Choose the next view to be matched against the main schema
choose_view:-
        view(V_name,_),             % next view name

        rep_view_int(V_name),
        view_and_schema_matching(V_name),
```

```
        fail.
choose_view.


rep_view_int(V_name):-
        nl, nl, nl, nl,
        write(['Integrating view:  ', V_name]), nl,
        !.


view_and_schema_matching(V_name) :-
        view_schema_match(V_name),
        !.

view_and_schema_matching(_).


%       match the current view contents with the main schema
view_schema_match(V_name):-
        rel(V_name, rel(Rel_names, Rel_occ, _)),

        rep_ent_rel(V_name, Rel_names, Rel_occ),

        match_view_and_schema_rels(V_name, rel(Rel_names, Rel_occ, _)),
        found_different_rel(V_name, rel(Rel_names, Rel_occ, _)),

        fail.

view_schema_match(_).


rep_ent_rel(V, Rel, Rel_occ):-
        ent_rel(V,
                ent(Ent1, _, _, _),
              rel(Rel, Rel_occ),
                ent(Ent2, _, _, _)),
        nl,
        write('integrating entity-relatioship:    '),
        write([Ent1, Rel, Ent2]),
        !.


match_view_and_schema_rels(V_name, rel(Rel_names, Rel_occ, Rel_prio)) :-

        assert(schema_rels(none)),
        match_view_rel_with_schema(V_name,
              rel(Rel_names, Rel_occ, Rel_prio)),
        !.


match_view_and_schema_rels(_, _).



        %       Matches the current relationship from the current view
        %       with all the relationships in the main schema.
match_view_rel_with_schema(V_name, rel(Rel_names, Rel_occ, Rel_prio)):-

                %       next relationship from the main schema to be matched.
        ent_rel_s(ent1(Ent1_names_s, Ent1_cards_s, Ent1_stat_s),
              rel(Rel_names_s),
              ent2(Ent2_names_s, Ent2_cards_s, Ent2_stat_s)),

        retract_fact(schema_rels(none)),
```

```
        match_view_rel_with_schema_rels(V_name,
                rel(Rel_names, Rel_occ, Rel_prio),
                ent_rel_s(ent1(Ent1_names_s, Ent1_cards_s, Ent1_stat_s),
                rel(Rel_names_s),
                ent2(Ent2_names_s, Ent2_cards_s, Ent2_stat_s))),

        fail.


match_view_rel_with_schema(V_name, rel(Rel_names, Rel_occ, Rel_prio)) :-
        schema_rels(none),
        retract(schema_rels(none)),
        assert_rel(V_name, rel(Rel_names, Rel_occ, Rel_prio)).

match_view_rel_with_schema(_, _).


        %       Matches the current relationship from the current view
        %       with all the relationships in the main schema.
match_view_rel_with_schema_rels(V_name, rel(Rel_names, Rel_occ, Rel_prio),
                ent_rel_s(ent1(Ent1_names, Ent1_cards, Ent1_stat),
                rel(Rel_names_s),
                                ent2(Ent2_names, Ent2_cards, Ent2_stat))):-

        match_rels(V_name, rel(Rel_names, Rel_occ, Rel_prio),
                ent_rel_s(ent1(Ent1_names, Ent1_cards, Ent1_stat),
                rel(Rel_names_s),
                ent2(Ent2_names, Ent2_cards, Ent2_stat))),
        !.


match_view_rel_with_schema_rels(_, _, _).




%       If the current rel of the current view being considered
%       was asserted as different to all the rels in the schema,
%       then this predicate add the view rel to the schema and
%       remove the fact that it is different to all the schema rels.


found_different_rel(V_name, rel(Rel_names, Rel_occ, Rel_prio)):-
        found_match_in_schema(V_name, rel(Rel_names, Rel_occ, Rel_prio)),
        !.

found_different_rel(_, _).



found_match_in_schema(V_name, rel(Rel_names, Rel_occ, Rel_prio)):-

                % extract view rel details
        ent_rel(V_name,
                  ent(Ent1_names, _, _, _),
                rel(Rel_names, Rel_occ),
                  ent(Ent2_names, _, _, _)),

        extract_matching_schema_rel(V_name,
                        Ent1_names, Rel_names, Rel_occ, Ent2_names, Rel_prio),

        !.


found_match_in_schema(_, _).
```

```
        % match on both ents and rel
extract_matching_schema_rel(_, Ent1_names, Rel_names, _, Ent2_names, _) :-
                % see if there is a matching schema rel
        ent_rel_s(ent1(Ent1_names, _, _),
                  rel(Rel_names),
                 ent2(Ent2_names, _, _)), !.


        % match on both ents and rel, with ents swapped
extract_matching_schema_rel(_, Ent1_names, Rel_names, _, Ent2_names, _) :-
                % see if there is a matching schema rel
        ent_rel_s(ent1(Ent2_names, _, _),
                  rel(Rel_names),
                 ent2(Ent1_names, _, _)), !.


        % recursive rel, on Ent1
extract_matching_schema_rel(_, Ent1_names, Rel_names, _, _Ent2_names, _) :-
                % see if there is a matching schema rel
        ent_rel_s(ent1(Ent1_names, _, _),
                  rel(Rel_names),
                 ent2(Ent1_names, _, _)), !.


        % recursive rel on Ent2
extract_matching_schema_rel(_, _Ent1_names, Rel_names, _, Ent2_names, _) :-
                % see if there is a matching schema rel
        ent_rel_s(ent1(Ent2_names, _, _),
                  rel(Rel_names),
                 ent2(Ent2_names, _, _)), !.



        % no matching rel in schema for current view rel
        % therefore, add rel to schjema
extract_matching_schema_rel(V_name, _, Rel_names, Rel_occ, _, Rel_prio) :-
        assert_rel(V_name, rel(Rel_names, Rel_occ, Rel_prio)), !.



report_rel_match_stats:-
        rep_ident,
        rep_n_ident,
        rep_cl_sim,
        rep_sim.


rep_ident:-
        retract(ident_no(A)), nl, nl,
        write(A),
        write('          identical entity-relationships were found').
rep_ident.



rep_n_ident:-
        retract(n_ident_no(A)), nl, nl,
        write(A),
        write('          near identical entity-relationships were found').
rep_n_ident.



rep_cl_sim:-
        retract(cl_sim_no(A)), nl, nl,
        write(A),
```

```
        write('            closely similar entity-relationships were found').
rep_cl_sim.



rep_sim:-
        retract(sim_no(A)), nl, nl,
        write(A),
        write('            similar entity-relationships were found').
rep_sim.
```

```
/*                                                                    */
/*      Module : rel_matcher                                          */
/*      Notes  : This module receives two relationships from the      */
/*               Binary VIM and matches them for all possibilities.   */
/*               Relationships can be identical, similar, equivalent or */
/*               different.                                           */
/*                                                                    */


%       The following data structure defines the format of the
%       individual schemas (views).
%       Some of the duplication of information has been necessary
%       to create unique objects.


:- dynamic e_a/1.
:- dynamic r_a/1.



%       This predicate is true if the two relationships are identical.
%       Two relationships are identical if they match on everything.

match_rels(V_name, rel(Rel_names, Rel_occ, Rel_prio),
                    ent_rel_s(ent1(Ent1_names, Ent1_cards, Ent1_stat),
                           rel(Rel_names_s),
                           ent2(Ent2_names, Ent2_cards, Ent2_stat))):-

        %   remove the corresponding assertions of rel atts and ent atts      %
identical mathes.
        rem1,
        rem2,

        identical_rels(V_name, rel(Rel_names, Rel_occ, Rel_prio),
               ent_rel_s(ent1(Ent1_names, Ent1_cards, Ent1_stat),
               rel(Rel_names_s),
               ent2(Ent2_names, Ent2_cards, Ent2_stat))),

        %   ensure all ent atts and rel atts yielded identical match
        \+ e_a(_),
        \+ r_a(_),
        add_ident_no,

        report('identical relationships', Rel_names, Rel_names_s).



%       This predicate succeeds if the two relationships are near identical.
%       Near identical relationships match on everything except
%       relationship attributes.

match_rels(V_name, rel(Rel_names, Rel_occ, Rel_prio),
                    ent_rel_s(ent1(Ent1_names, Ent1_cards, Ent1_stat),
                           rel(Rel_names_s),
                           ent2(Ent2_names, Ent2_cards, Ent2_stat))):-

        %   remove the corresponding assertions of ent atts identical matches
        rem1,

        near_identical_rels(V_name, rel(Rel_names, Rel_occ, Rel_prio),
               ent_rel_s(ent1(Ent1_names, Ent1_cards, Ent1_stat),
               rel(Rel_names_s),
               ent2(Ent2_names, Ent2_cards, Ent2_stat))),


        %   ensure all ent atts and rel atts yielded identical match
        \+ e_a(_),

        add_n_ident_no,
```

```
        report('near identical relationships', Rel_names, Rel_names_s),

        update_near_ident_rel(V_name, rel(Rel_names, Rel_occ, Rel_prio),
               ent_rel_s(ent1(Ent1_names, Ent1_cards, Ent1_stat),
               rel(Rel_names_s),
               ent2(Ent2_names, Ent2_cards, Ent2_stat))).


%       This predicate succeds if the two relationships are closely similar.
%       Closely similar relationships do not match on
%       relationship attributes or the entity attributes.

match_rels(V_name, rel(Rel_names, Rel_occ, Rel_prio),
                     ent_rel_s(ent1(Ent1_names, Ent1_cards, Ent1_stat),
                            rel(Rel_names_s),
                            ent2(Ent2_names, Ent2_cards, Ent2_stat))) :-

        closely_similar_rels(V_name, rel(Rel_names, Rel_occ, Rel_prio),
               ent_rel_s(ent1(Ent1_names, Ent1_cards, Ent1_stat),
               rel(Rel_names_s),
               ent2(Ent2_names, Ent2_cards, Ent2_stat))),

        add_cl_sim_no,
        report('closely similar relationships', Rel_names, Rel_names_s),


        update_closely_similar_rel(V_name, rel(Rel_names, Rel_occ, Rel_prio),
               ent_rel_s(ent1(Ent1_names, Ent1_cards, Ent1_stat),
               rel(Rel_names_s),
               ent2(Ent2_names, Ent2_cards, Ent2_stat))).



%       This predicate succeeds if the two relationships are similar.
%       Similar relationships simply match on the relationships names and
%       entity names.

match_rels(V_name, rel(Rel_names, Rel_occ, Rel_prio),
                     ent_rel_s(ent1(Ent1_names, Ent1_cards, Ent1_stat),
                            rel(Rel_names_s),
                            ent2(Ent2_names, Ent2_cards, Ent2_stat))) :-

        similar_rels(V_name, rel(Rel_names, Rel_occ, Rel_prio),
               ent_rel_s(ent1(Ent1_names, Ent1_cards, Ent1_stat),
               rel(Rel_names_s),
               ent2(Ent2_names, Ent2_cards, Ent2_stat))),

        add_sim_no,
        report('similar relationships', Rel_names, Rel_names_s),

        update_similar_rel(V_name, rel(Rel_names, Rel_occ, Rel_prio),
               ent_rel_s(ent1(Ent1_names, Ent1_cards, Ent1_stat),
               rel(Rel_names_s),
               ent2(Ent2_names, Ent2_cards, Ent2_stat))).

match_rels(_, _, _).


%       If the two relationships do not match as identical,
%       closely similar, etc.., then they are different, and hence
%       the view relationship under consideration is added to the schema.


        % Receives two relationships, the first is from the current view
        % being integrated and the other is from the main schema.
        % These two relationships are tested to see if they are identical.
        % The two relationships are identical if they match on everything.
```

```
identical_rels(V_name, rel(Rel_names, Rel_occ, Rel_prio),
                        ent_rel_s(ent1(Ent1_s, _, _),
                                rel(Rel_names_s),
                                        ent2(Ent2_s, _, _))):-

                % match the two rels multi-names
        multi_name_match(Rel_names, Rel_names_s),

                % check if corresp ent cards match exactly
        match_ent_cards(V_name, rel(Rel_names, Rel_occ, Rel_prio),
                ent_rel_s(ent1(Ent1_s, _, _),
                rel(Rel_names_s),
                ent2(Ent2_s, _, _))),

                % match the attributes of both rels
        ident_rel_atts(V_name, rel(Rel_names, Rel_occ, Rel_prio),
                ent_rel_s(ent1(Ent1_s, _, _),
                rel(Rel_names_s),
                ent2(Ent2_s, _, _))),

                % match the entities of both rels
        ident_rel_ents(V_name, rel(Rel_names, Rel_occ, Rel_prio),
                ent_rel_s(ent1(Ent1_s, _, _),
                rel(Rel_names_s),
                ent2(Ent2_s, _, _))).



        % This predicate tests to see if the two relationships
        % are near identical.
        % Near identical relationships match on rel names and the entities.
        % The relationship attributes are not considered.

near_identical_rels(V_name, rel(Rel_names, Rel_occ, Rel_prio),
                        ent_rel_s(ent1(Ent1_s, _, _),
                                rel(Rel_names_s),
                                        ent2(Ent2_s, _, _))):-

        multi_name_match(Rel_names, Rel_names_s),

                % corresponding ent cards match exactly
        match_ent_cards(V_name, rel(Rel_names, Rel_occ, Rel_prio),
                ent_rel_s(ent1(Ent1_s, _, _),
                        rel(Rel_names_s),
                ent2(Ent2_s, _, _))),

        ident_rel_ents(V_name, rel(Rel_names, Rel_occ, Rel_prio),
                ent_rel_s(ent1(Ent1_s, _, _),
                rel(Rel_names_s),
                ent2(Ent2_s, _, _))).



        % This predicate checks if the two relationships are closely similar.
        % Closely similar relationships match on the relationship names
        % and the entities names, but not on their attributes.
        % Also the entities match on the cardinalities

closely_similar_rels(V_name, rel(Rel_names, Rel_occ, Rel_prio),
                        ent_rel_s(ent1(Ent1_s, Ent1_cards_s, _),
                        rel(Rel_names_s),
                                ent2(Ent2_s, Ent2_cards_s, _))):-

                % match the two rels multi-names
        multi_name_match(Rel_names, Rel_names_s),

                % corresponding ent cards match exactly
        match_ent_cards(V_name, rel(Rel_names, Rel_occ, Rel_prio),
                ent_rel_s(ent1(Ent1_s, _, _),
```

```
                rel(Rel_names_s),
            ent2(Ent2_s, _, _))),

                % get full details of the view relationship
        ent_rel(V_name,
            ent(Ent1_names, _Ent1_occ, Ent1_cards, _Ent1_stat),
            rel(Rel_names, _Rel_occ),
            ent(Ent2_names, _Ent2_occ, Ent2_cards, _Ent2_stat)),

                % match the names and cards of both ents
        ent_names_and_cards_match(Ent1_s, Ent2_s, Ent1_names, Ent2_names,
            Ent1_cards_s, Ent2_cards_s, Ent1_cards, Ent2_cards).



        % This predicate checks if the two relationships are  similar.
        % Similar relationships match on the relationship names
        % and the entities names, but not on their attributes.
        % Also the entities match on the cardinalities

similar_rels(V_name, rel(Rel_names, Rel_occ, _Rel_prio),
                                ent_rel_s(ent1(Ent1_s, _, _),
                                    rel(Rel_names_s),
                                        ent2(Ent2_s, _, _))):-

        %       match the two rels multi-names
        multi_name_match(Rel_names, Rel_names_s),


        % get full details of the view relationship
        ent_rel(V_name,
            ent(Ent1_names, _, _, _),
            rel(Rel_names, Rel_occ),
            ent(Ent2_names, _, _, _)),

        %       Match the corresponding entity names of the two rels
        match_rel_ent_names(Ent1_s, Ent1_names, Ent2_s, Ent2_names).




        % Match the corresponding entity names of the two rels

match_rel_ent_names(Ent1_s, Ent1_names, Ent2_s, Ent2_names) :-
        %       match the names  of both ents
        multi_name_match(Ent1_s, Ent1_names),
        multi_name_match(Ent2_s, Ent2_names).


match_rel_ent_names(Ent1_s, Ent1_names, Ent2_s, Ent2_names) :-
        multi_name_match(Ent1_s, Ent2_names),
        multi_name_match(Ent2_s, Ent1_names).



        % There are four possibilities of matching entity names and their
        % The reason for including the names test and the cardinalities test
        % is to make sure that the correspondence of names and cards is true.


        % This is called by the identical_rels predicate.
        % It checks if two given entities of the same relationship or
        % different relationships are identical.
        % Identical entities match exactly on names, cardinalities,
        % attributes names and details, etc. They dont have to match on status.
```

```
        % There are two possible situations where the entities are identical,
        % and this is signified by the | symbol.

ident_rel_ents(V_name, rel(Rel_names, Rel_occ, _Rel_prio),
                            ent_rel_s(ent1(Ent1_s, _, _),
                            rel(Rel_names_s),
                                        ent2(Ent2_s, _, _))):-

        %       extract ent-rel details from the view
        ent_rel(V_name,
                  ent(Ent1_v, Ent1_occ_v, _, _),
                rel(Rel_names, Rel_occ),
                  ent(Ent2_v, Ent2_occ_v, _, _)),

        %       Match the four possibilities of entity match of rels
        ident_rel_ent_test(V_name, Ent1_v, Ent1_occ_v,
                            Rel_names, Rel_occ,
                            Ent2_v, Ent2_occ_v,
                    Ent1_s, Rel_names_s, Ent2_s).



        % Match the first possibility of the entity match of the rels
ident_rel_ent_test(V_name, Ent1_v, Ent1_occ_v,
                            Rel_names, Rel_occ,
                            Ent2_v, Ent2_occ_v,
                                    Ent1_s, Rel_names_s, Ent2_s) :-

                % Match first two ents
        ident_ents(V_name, Rel_names, Rel_occ, Ent1_v, Ent1_occ_v,
                            Ent1_s, Rel_names_s),

                % Match second two ents
        ident_ents(V_name, Rel_names, Rel_occ, Ent2_v, Ent2_occ_v,
                            Ent2_s, Rel_names_s).



        % match crossing entities
ident_rel_ent_test(V_name, Ent1_v, Ent1_occ_v,
                            Rel_names, Rel_occ,
                            Ent2_v, Ent2_occ_v,
                                    Ent1_s, Rel_names_s, Ent2_s) :-

                % Match first two ents
        ident_ents(V_name, Rel_names, Rel_occ, Ent1_v, Ent1_occ_v,
                            Ent2_s, Rel_names_s),

                % Match second two ents
        ident_ents(V_name, Rel_names, Rel_occ, Ent2_v, Ent2_occ_v,
                            Ent1_s, Rel_names_s).


%       This predicate is called by the predicate ident_rel_ents.
%       This predicate tests if the two entities are identical.
%       Identical ents match on entity names and attributes names and
%       attribute details

ident_ents(V_name, Rel_names, Rel_occ, Ent_v, Ent_occ_v,
                                    Ent_s, _Rel_names_s) :-

        %       match the multi_names of entities
        multi_name_match(Ent_v, Ent_s),
        ident_ent_atts(V_name, Rel_names, Rel_occ, Ent_v, Ent_occ_v, Ent_s).
```

```
%       There are four possibilities of matching entity names and their cards
%       The reason for including the names test and the cardinalities test
%       is to make sure that the correspondence of names and cards is true.

ent_names_and_cards_match(Ent1_s, Ent2_s, Ent1_names, Ent2_names,
                    Ent1_cards_s, Ent2_cards_s, Ent1_cards, Ent2_cards):-

        %       match nams and cardinalities of corresponding entities
        multi_name_match(Ent1_s, Ent1_names),
        multi_name_match(Ent2_s, Ent2_names),
        multi_name_match(Ent1_cards_s, Ent1_cards),
        multi_name_match(Ent2_cards_s, Ent2_cards).


ent_names_and_cards_match(Ent1_s, Ent2_s, Ent1_names, Ent2_names,
                    Ent1_cards_s, Ent2_cards_s, Ent1_cards, Ent2_cards):-

        multi_name_match(Ent1_s, Ent2_names),
        multi_name_match(Ent2_s, Ent1_names),
        multi_name_match(Ent1_cards_s, Ent2_cards),
        multi_name_match(Ent2_cards_s, Ent1_cards).



%       Matches the attributes of the two relationships, which are
%       the relationship from the view to be integrated and
%       the relationship from the main schema.


ident_rel_atts(V_name, rel(Rel_names, Rel_occ, _Rel_prio),
                    ent_rel_s(ent1(_Ent1_s, _, _),
                                rel(Rel_names_s),
                                        ent2(_Ent2_s, _, _))):-

        %       extract the details of view rel att
        rel_att(V_name,
                rel(Rel_names, Rel_occ),
                att_det(Att_names, Vals, K_stat, Att_prio)),


        %       matches the rest of the atts from the schema rel
        ident_rest_rel_att(Att_names, Vals, K_stat, Att_prio,
                Rel_names_s),

        fail.

ident_rel_atts(_, _, _).



%       This predicate is called by ident_rel_atts
%       It receives the details of one attribute of the first rel (view rel)
%       and matches it with all the atts of the 2nd rel (schema rel).
%       This predicate assumes there is only one of each rel name
%       Attributes priorities are not considered

ident_rest_rel_att(Att_names, Vals, K_stat, _Att_prio, Rel_names_s):-

                % extract details of schema rel attributes
        rel_att_det_s(Rel_names_s,
                att(Att_names, Vals_s, K_stat_s, _Prio_s)),

        nonvar(Vals),
        nonvar(Vals_s),
        Vals==Vals_s,
        K_stat==K_stat_s.

ident_rest_rel_att(_, _, _, _, _):-
```

```
        assert(r_a(mismatch)).



%       Matches the attributes of the two entities,
%       These entities are  from the view to be integrated and
%       the relationship from the main schema.

ident_ent_atts(V_name, _Rel_names, _Rel_occ, Ent_v, Ent_occ_v, Ent_s) :-


        ent_att(V_name,
                ent(Ent_v , Ent_occ_v),
                att_det(Att_names, Vals, K_stat, Att_prio)),


        %       matches the rest of the atts from  the other ent
        ident_rest_ent_att(Att_names, Vals, K_stat, Att_prio, Ent_s),

        fail.


ident_ent_atts(_, _, _, _, _, _).



%       This predicate is called by ident_ent_atts
%       It receives the details of one attribute of the first ent
%       and matches it with all the atts of the 2nd ent.

ident_rest_ent_att(Att_names, Vals, K_stat, _Att_prio, Ent_s):-


        ent_att_det_s(Ent_s, att(Att_names, Vals_s, K_stat_s, _Prio_s)),

        nonvar(Vals),
        nonvar(Vals_s),
        Vals==Vals_s,
        K_stat==K_stat_s.

ident_rest_ent_att(_, _, _, _, _):-
        assert(e_a(mimatch)).


    %  Remove the assertions indicating identical ent att match
rem1:-
        retract(e_a(_)),
        fail.
rem1.


    %  Remove the assertions indicating identical ent att match
rem2:-      ,
        retract(r_a(_)),
        fail.
rem2.     .


report(M, Rel_names, Rel_names_s) :-
        nl, nl,
        write(M), nl,
        write(['View rel is  ', Rel_names, 'Schema rel is  ', Rel_names_s]),
        nl, nl.
```

```
:- dynamic ident_no/1.
:- dynamic n_ident_no/1.
:- dynamic cl_sim_no/1.
:- dynamic sim_no/1.


ini:-
        ini_ident_no,
        ini_n_ident_no,
        ini_cl_sim_no,
        ini_sim_no.

ini_ident_no:-
        retract(ident_no(_)),
        fail.
ini_ident_no:-
        assert(ident_no(0)).


ini_n_ident_no:-
        retract(n_ident_no(_)),
        fail.
ini_n_ident_no:-
        assert(n_ident_no(0)).


ini_cl_sim_no:-
        retract(cl_sim_no(_)),
        fail.
ini_cl_sim_no:-
        assert(cl_sim_no(0)).


ini_sim_no:-
        retract(sim_no(_)),
        fail.
ini_sim_no:-
        assert(sim_no(0)).


add_ident_no:-
        retract(ident_no(S)),
        T is S + 1,
        assert(ident_no(T)).
add_ident_no.


add_n_ident_no:-
        retract(n_ident_no(S)),
        T is S + 1,
        assert(n_ident_no(T)).
add_n_ident_no.


add_cl_sim_no:-
        retract(cl_sim_no(S)),
        T is S + 1,
        assert(cl_sim_no(T)).
add_cl_sim_no.
```

```
add_sim_no:-
        retract(sim_no(S)),
        T is S + 1,
        assert(sim_no(T)).
add_sim_no.
```

```
/*                                                                      */
/*      Module : merger.pl                                              */
/*      Author : Mansoor Hassan                                         */
/*      Notes  : This module serves the binary_vim module (main program)  */
/*               merger asserts information from the different views in the */
/*               main schema.                                           */
/*               If the information is already asserted in the schema then  */
/*               merger simply ignores it.                              */
/*               If the information from the view is different from that    */
/*               in the schema, merger then gives the DBA the chance to     */
/*               choose                                                 */
/*                                                                      */


        % This predicate adds the information contents (semantics) of the
        % view rel to the schema. This is carried out every time  aview
        % rel is identified as a new rel, as it does not exist in the schema.
        % Not all the information in the view rel are added to the schema,
        % since some of this inf. might have already been added
        % throug ents involved in other rels.


assert_rel(V_name, rel(Rel_names, Rel_occ, Rel_prio)):-

                % find full rel details
        ent_rel(V_name,
                ent(Ent1_names, Ent1_occ, Ent1_cards, Ent1_stat),
                rel(Rel_names, Rel_occ),
                ent(Ent2_names, Ent2_occ, Ent2_cards, Ent2_stat)),


                % assert the rel name and prio to the schema if not there
                % Module
        add_and_update_rel_names(V_name, Rel_names, Rel_occ, Rel_prio),

                % assert the ent relationship connection
        assert_fact(ent_rel_s(ent1(Ent1_names, Ent1_cards, Ent1_stat),
                rel(Rel_names),
                ent2(Ent2_names, Ent2_cards, Ent2_stat))),

                % assert the schema rel atts from the view rel atts
                % Module
        add_rel_att_det_to_schema(V_name, Rel_names, Rel_occ),


                % extract the other details of entitis
        ent(V_name, ent(Ent1_names, Ent1_occ, Ent1_prio)),
        ent(V_name, ent(Ent2_names, Ent2_occ, Ent2_prio)),


                % assert the priorities of the entities
        add_and_update_ent_names(V_name, Ent1_names, Ent1_occ, Ent1_prio),
        add_and_update_ent_names(V_name, Ent2_names, Ent2_occ, Ent2_prio),

                % assert the schema rel ent atts det from
                % the view rel ent atts det, if any

                % assert first entity atts det
        assert_ent_att_det(V_name, Rel_names, Rel_occ, Ent1_names , Ent1_occ),


                % assert second entity atts det
        assert_ent_att_det(V_name, Rel_names, Rel_occ, Ent2_names , Ent2_occ),

                % match and assert the cardinalities of the corr ents
        match_and_assert_ent_cards(V_name, Rel_names, Rel_occ,
                        Ent1_names, Ent1_occ, Rel_names, Ent1_names),

        match_and_assert_ent_cards(V_name, Rel_names, Rel_occ,
```

```
                Ent2_names, Ent2_occ, Rel_names, Ent2_names).

assert_rel(_, _).



%       The view rel and the main schema rel are near identical.
%       This predicate will update the contents of the main schema rel
%       with some of the contents of view rel

update_near_ident_rel(V_name, rel(Rel_names, Rel_occ, _), _) :-

        %       insert atts of view rel, if any to the main schema rel
        add_rel_att_det_to_schema(V_name, Rel_names, Rel_occ).

update_near_ident_rel(_, _, _) :- !.



        % similar rels have only the rels names and ents names in common.
        % every time two similar rels are found the main schema rel is
        % updated with the information held in the view rel

update_similar_rel(V_name, rel(Rel_names, Rel_occ, _),
                        ent_rel_s(ent1(Ent1_names, Cards1, Stat1),
                        rel(Rel_names_s),
                                        ent2(Ent2_names, Cards2, Stat2))) :-

        %       assert atts of view rel, if any to the main schema rel
        add_rel_att_det_to_schema(V_name, Rel_names, Rel_occ),


        %       assert ent atts of view rel, if not already associated
        %       with the corresponding ents of the current rel of the
        %       main schema.
        assert_ent_atts(V_name, rel(Rel_names, Rel_occ, _),
                        ent_rel_s(ent1(Ent1_names, Cards1, Stat1),
                        rel(Rel_names_s),
                        ent2(Ent2_names, Cards2, Stat2))),


        %       assert ent cards of view rel, if not already associated
        %       with the corresponding ents of the current rel of the
        %       main schema.
        assert_ent_cards(V_name, rel(Rel_names, Rel_occ, _),
                        ent_rel_s(ent1(Ent1_names, Cards1, Stat1),
                        rel(Rel_names_s),
                        ent2(Ent2_names, Cards2, Stat2))).


        %       assert ent cards of view rel, if not already associated
        %       with the corresponding ents of the current rel of the
        %       main schema.
/*      assert_ent_stat(V_name, rel(Rel_names, Rel_occ, _),
                        ent_rel_s(ent1(Ent1_names, Cards1, Stat1),
                        rel(Rel_names_s),
                        ent2(Ent2_names, Cards2, Stat2))).
*/

update_similar_rel(_, _, _).



        % This predicate deals with closely similar rels.
        % Closely similar rels do not have to match on rel atts
        % or ent atts.
        % This predicate therefore updates the schema rel with
        % the view rel atts for the rel name and the ents.
```

```
update_closely_similar_rel(V_name, rel(Rel_names, Rel_occ, _),
                    ent_rel_s(ent1(Ent1_names, Cards1, Stat1),
                    rel(Rel_names_s),
                                ent2(Ent2_names, Cards2, Stat2))) :-

        %       assert atts of view rel, if any to the main schema rel
        add_rel_att_det_to_schema(V_name, Rel_names, Rel_occ),


        %       assert ent atts of view rel, if not already associated
        %       with the corresponding ents of the current rel of the
        %       main schema.
        identify_correspond_rel_ents(V_name, rel(Rel_names, Rel_occ, _),
                    ent_rel_s(ent1(Ent1_names, Cards1, Stat1),
                    rel(Rel_names_s),
                    ent2(Ent2_names, Cards2, Stat2))).



        %       assert ent cards of view rel, if not already associated
        %       with the corresponding ents of the current rel of the
        %       main schema.
/*      assert_ent_stat(V_name, rel(Rel_names, Rel_occ, _),
                    ent_rel_s(ent1(Ent1_names, Cards1, Stat1),
                    rel(Rel_names_s),
                    ent2(Ent2_names, Cards2, Stat2))), !.
*/

update_closely_similar_rel(_, _, _) :- !.



        % to identify the corresponding entity names of the
        % two relationships in order to assert the view rel ent atts
        % to the schema rel ent atts, if not already part of the entities

identify_correspond_rel_ents(V_name, rel(Rel_names, Rel_occ, _),
                ent_rel_s(ent1(Ent1_s, Ent1_cards_s, _Ent1_stat_s),
                rel(_Rel_names_s),
                        ent2(Ent2_s, Ent2_cards_s, _Ent2_stat_s))) :-


                % extract the entities of the view rel
        ent_rel(V_name,
                ent(Ent1_names, Ent1_occ, Ent1_cards, _Ent1_stat),
        rel(Rel_names, Rel_occ),
                ent(Ent2_names, Ent2_occ, Ent2_cards, _Ent2_stat)),


                % match names and cardinalities of corresponding entities
        multi_name_match(Ent1_s, Ent1_names),
        multi_name_match(Ent2_s, Ent2_names),

        (multi_name_match(Ent1_cards_s, Ent1_cards),
        multi_name_match(Ent2_cards_s, Ent2_cards); true),

                % assert the atts of the view rel ent in the corresponding
                % schema rel ent, if not already asserted
        assert_corr_ent_atts(V_name, Ent1_names, Ent1_occ),

        assert_corr_ent_atts(V_name, Ent2_names, Ent2_occ),


                % match the cardinalities of the corresponding ents.
                % If no card is given for for schema ent, then assert schema ent
                % cardinality from view ent.
                % If different cards then consult DBA
        match_and_assert_ent_cards(V_name, Rel_names, Rel_occ,
                        Ent1_names, Ent1_occ,
                                Rel_names_s, Ent1_s),
```

```
        match_and_assert_ent_cards(V_name, Rel_names, Rel_occ,
                        Ent2_names, Ent2_occ,
                                Rel_names_s, Ent2_s).


                % match the status of the corresponding ents.
                % use the view ent to complement the schema ent stat.
                % if the two stats disagree then consult DBA
/*      match_and_assert_ent_stat(V_name, Rel_names, Rel_occ,
                        Ent1_names, Ent1_occ,
                                Rel_names_s, Ent1_s),

        match_and_assert_ent_stat(V_name, Rel_names, Rel_occ,
                        Ent2_names, Ent2_occ,
                                Rel_names_s, Ent2_s).

*/


        % to identify the corresponding entity names of the
        % two relationships in order to assert the view rel ent atts
        % to the schema rel ent atts, if not already part of the entities

identify_correspond_rel_ents(V_name, rel(Rel_names, Rel_occ, _),
                ent_rel_s(ent1(Ent1_s, Ent1_cards_s, _Ent1_stat_s),
                        rel(_Rel_names_s),
                                ent2(Ent2_s, Ent2_cards_s, _Ent2_stat_s))) :-


                % extract the entities of the view rel
        ent_rel(V_name,
                ent(Ent1_names, Ent1_occ, Ent1_cards, _Ent1_stat),
        rel(Rel_names, Rel_occ),
                ent(Ent2_names, Ent2_occ, Ent2_cards, _Ent2_stat)),


                % match names and cardinalities of corresponding entities
        multi_name_match(Ent1_s, Ent2_names),
        multi_name_match(Ent2_s, Ent1_names),

        (multi_name_match(Ent1_cards_s, Ent2_cards),
        multi_name_match(Ent2_cards_s, Ent1_cards); true),

                % assert the atts of the view rel ent in the corresponding
                % schema rel ent, if not already asserted
        assert_corr_ent_atts(V_name, Ent1_names, Ent1_occ),

        assert_corr_ent_atts(V_name, Ent2_names, Ent2_occ),


        %       match the cardinalities of the corresponding ents.
        %       If no card is given for for schema ent, then assert schema ent
        %       cardinality from view ent.
        %       If different cards then consult DBA
        match_and_assert_ent_cards(V_name, Rel_names, Rel_occ,
                        Ent1_names, Ent1_occ,
                                Rel_names_s, Ent2_s),

        match_and_assert_ent_cards(V_name, Rel_names, Rel_occ,
                        Ent2_names, Ent2_occ,
                                Rel_names_s, Ent1_s).


        %       match the status of the corresponding ents.
        %       use the view ent to complement the schema ent stat.
        %       if the two stats disagree then consult DBA
/*      match_and_assert_ent_stat(V_name, Rel_names, Rel_occ,
                        Ent1_names, Ent1_occ,
                                Rel_names_s, Ent2_s),
```

```
        match_and_assert_ent_stat(V_name, Rel_names, Rel_occ,
                        Ent2_names, Ent2_occ,
                              Rel_names_s, Ent1_s).
*/

identify_correspond_rel_ents(_, _, _) :- !.
```

```
/*      Module : dynamic_objects                                          */
/*      Author : Mansoor Hassan                                           */
/*      Notes  : This file contains a list of all the predicates (objects) */
/*               which are used by bvim                                    */


:- dynamic att_names_s/1.

:- dynamic rel_names_s/2.

:- dynamic ent_names_s/2.

:- dynamic ent_att_names/2.

:- dynamic rel_att_names_s/2.

:- dynamic ent_att_det_s/2.

:- dynamic rel_att_det_s/2.

:- dynamic ent_rel_s/3.


        % used by the predicate view_schema_match to indicate a diff rel was
        % found.
:- dynamic different_rels/6.



        % These are the conflict history predicates.

        % history of DBA given rel prio to resolve rel prio conflict
        % hist_rel_prio(rel_names_s(Rel_names, Hist_rel_prio)).
:- dynamic hist_rel_prio/1.



        % history of DBA given ent prio to resolve ent prio conflict, stored as:
        % hist_ent_prio(ent_names_s(Ent_names, New_prio))
:- dynamic hist_ent_prio/1.



        % history of DBA given rel att key status, to resolve a rel att
        % key conflict, stored as :
        % hist_rel_att_key_stat(Rel_names, Att_names, K_stat_h),
:- dynamic hist_rel_att_key_stat/3.



        % history of DBA given rel att value, to resolve a rel att
        % value conflict, stored as :
        % hist_rel_att_val(Rel_names, Att_names, Val_h),
:- dynamic hist_rel_att_val/3.



        % history of DBA given ent_rel card value, to resolve cardinality
        % value conflict, stored as :
        % hist_ent_rel_card(Rel_names, Ent_names, Card_h),
:- dynamic hist_ent_rel_card/3.



              % has this conflict been recorded in history,
              % if so, the history k stat is used
              % hist_ent_att_key_stat(Ent_names, Att_names, K_stat_h).
```

```
:- dynamic hist_ent_att_key_stat/3.


            % has this conflict been recorded in history,
            % if so, the history k stat is used
            % hist_ent_att_val(Ent_names, Att_names, K_stat_h).
:- dynamic hist_ent_att_val/3.
```

```
/*      Module : bvim_modules                                                  */
/*      Author : Mansoor Hassan                                                */
/*      Notes  : This file contains a list of the files which contain          */
/*               the modules which form bvim. These modules are loaded        */
/*               when bvim is called.                                         */


        % All the following modules (files) are part pf bvim.


:-  [schema_file_handling].
:-  [user_views].
:-  [merger].
:-  [rel_matcher].
:-  [comm_preds].

:-  [file_handling].

:-  [query].
:-  [query_views].
:-  [query_schema].

:-  [multi_name_match].

:-  [add_and_update_rel_names].
:-  [add_and_update_ent_names].
:-  [add_rel_att_det_to_schema].
:-  [add_ent_att_det_to_schema].

:-  [cardinality_handling].

:-  [update_ent_rel_card].
:-  [update_rel_att_key_stat].
:-  [update_rel_att_val].
:-  [update_ent_att_key_stat].
:-  [update_ent_att_val].


            % Display the contents of the schema or the views
            % in the VDL format
:-  [schema_vdl_form].
:-  [views_vdl_form].

:-  [views_stats].
:-  [schema_stats].

%     Cross object definition handling modules
%     ****************************************

:-  [att_rel_cross_er_conn].
:-  [att_rel_cross_no_er_conn].
:-  [att_val_as_ent_rel].
:-  [ent_att_cross].
:-  [ent_rel_cross].


%     These modules change the name of a given object in all its occurences in
%   . the schema
:-  [replace_rel_name].
:-  [replace_ent_name].
:-  [replace_att_name].

:-  [change_att_k_stat].


%:-  [delete_ent].
:-  [delete_att].
%:-  [delete_rel].
```

```
:- [post_int].

:- [cross_conflicts].

:- [fuzzy_match_ents_t].
:- [gcs_post_int_checks].
```

```
/*      Module : update_ent_att_key_stat                                    */
/*      Author : Mansoor Hassan                                             */
/*      Notes  : This module receives the key status of the same attribute  */
/*               of the view rel and the schema rel. It matches these two   */
/*               key status's. If thet dont match, the it asks the history  */
/*               records to see if such conflict was resolved previously    */
/*               by the DBA, otherwise it asks the DBA to decide a new key  */
/*               status and it assertys this fact in the history for any    */
/*               future conflicts.                                          */



      % decides the real att value between the view ent att
      % and schema rel att.

update_ent_att_key_stat(_V_name, _Ent_names, _Ent1_occ, _Ent_s,
                        _Att_names, K_stat, K_stat_s, _Real_k_stat) :-

            % equal key stats, or view ent att key stat is not given
            % then no change to schema rel att key stat

            % both keys are intantiated
      nonvar(K_stat),
      nonvar(K_stat_s),

      K_stat=K_stat_s,
      assert(real_ent_att_key_stat(K_stat_s)).



update_ent_att_key_stat(_V_name, _Ent_names, _Ent1_occ, _Ent_s,
                        _Att_names, K_stat, K_stat_s, _Real_k_stat) :-

            % no view ent att k stat is given, so no change
      var(K_stat),
      assert(real_ent_att_key_stat(K_stat_s)).


update_ent_att_key_stat(_V_name, _Ent_names, _Ent1_occ, _Ent_s,
                        _Att_names, K_stat, K_stat_s, _Real_k_stat) :-

            % schema rel att k stat is not given and view ent att k stat
            % is given, so, use view ent att k stat
      var(K_stat_s),
      nonvar(K_stat),
      assert(real_ent_att_key_stat(K_stat)).


update_ent_att_key_stat(_V_name, Ent_names, _Ent1_occ, _Ent_s,
                        Att_names, K_stat, K_stat_s, _Real_k_stat) :-

            % both of rels k status are given, but different
      nonvar(K_stat_s),
      nonvar(K_stat),

            % has this conflict been recorded in history,
            % if so, the history k stat is used
      hist_ent_att_key_stat(Ent_names, Att_names, K_stat_h),
      assert(real_ent_att_key_stat(K_stat_h)).


update_ent_att_key_stat(V_name, Ent_names, _Ent1_occ, _Ent_s,
                        Att_names, K_stat, K_stat_s, Real_k_stat) :-

      nonvar(K_stat_s),
      nonvar(K_stat),
```

```
        ask_DBA_for_ent_att_k_stat(V_name, Ent_names, Ent_occ, Att_names,
                K_stat, K_stat_s, Real_k_stat, Reply),

                % investigate DBA key status reply
        ent_att_k_stat_confl_DBA_reply(V_name, Ent_names, Ent_occ,
                Att_names, K_stat, K_stat_s, Real_k_stat, Reply).


update_ent_att_k_stat(_, _, _, _, _, _, _, _).




        % a conflict in the two rels att key status, which is not in the
        % history, then, the DBA is asked.

ask_DBA_for_ent_att_k_stat(V_name, Ent_names, _Ent_occ, Att_names,
                K_stat, K_stat_s, _Real_k_stat, Reply) :-

        clear_screen, nl,
        write('CONFLICT between view and schema entity att key status'),
        nl, nl,
        write('view name is :  '),
        write(V_name), nl, nl,
        write('entity name is :  '),
        write(Ent_names), nl, nl,
        write('attribute  with conflict is:  '),
        write(Att_names), nl, nl,
        write('schema entity has key status :  '),
        write(K_stat_s), nl, nl,
        write('view entity has key status :  '),
        write(K_stat), nl, nl, nl,
        write('Please do one of the following :'), nl, nl,
        write('    1.      Enter a new key status'), nl,
        write('    2.   Type q or query to get information from the views or'),
        write(' schema'), nl,
        read(Reply).



        % DBA has given new key status or requested information about
        % the views or schema to help him decide.

ent_att_k_stat_confl_DBA_reply(V_name, Ent_names, _Ent_occ,
                        Att_names, K_stat, K_stat_s, _Real_k_stat, Reply) :-
        (Reply==q;
        Reply==query),
        query,
        ask_DBA_for_ent_att_k_stat(V_name, Ent_names, _Ent_occ, Att_names,
                K_stat, K_stat_s, _Real_k_stat, _).



        % DBA has given new key status
ent_att_k_stat_confl_DBA_reply(_, Ent_names, _, Att_names, _, _, _, Reply) :-
        (Reply==key;
        Reply==notkey),
        assert_fact(real_ent_att_key_stat(Reply)),
        assert_fact(hist_ent_att_key_stat(Ent_names, Att_names, Reply)).


        % DBA has given incorrect key status
ent_att_k_stat_confl_DBA_reply(V_name, Ent_names, _Ent_occ,
                        Att_names, K_stat, K_stat_s, _Real_k_stat, Reply) :-
        nl, nl, nl, nl,
        write('You have typed the wrong key status'), nl,
        write('Type either key or notkey'), nl,
```

```
ask_DBA_for_ent_att_k_stat(V_name, Ent_names, _Ent_occ, Att_names,
        K_stat, K_stat_s, _Real_k_stat, Reply), !.
```

```
/*      Module : update_ent_att_val                                          */
/*      Author : Mansoor Hassan                                              */
/*      Notes  : This module receives the value of the same attribute        */
/*               of the view rel and the schema rel. It matches these two    */
/*               values. If they dont match, the it asks the history         */
/*               records to see if such conflict was resolved previously     */
/*               by the DBA, otherwise it asks the DBA to decide a new       */
/*               value and it assertys this fact in the history for any      */
/*               future conflicts.                                           */


      % decides the real att value between the view ent att
      % and schema ent att.
update_ent_att_val(_V_name, _Ent_names, _Ent1_occ, _Ent_s,
                           _Att_names, Val, Val_s, _Real_val) :-

            % equal values, or view ent att value is not given
            % then no change to schema ent att value

      Val==[],      % no value given for view ent att
      Val_s==[],    % no value given for schema ent att
      multi_name_match(Val, Val_s),
      assert(real_ent_att_val(Val_s)).


update_ent_att_val(_V_name, _Ent_names, _Ent1_occ, _Ent_s,
                           _Att_names, Val, Val_s, _Real_val) :-

            % no view ent att k stat is given, so no change
      Val==[],
      assert(real_ent_att_val(Val_s)).


update_ent_att_val(_V_name, _Ent_names, _Ent1_occ, _Ent_s,
                           _Att_names, Val, Val_s, _Real_val) :-

            % schema ent att k stat is not given and view ent att k stat
            % is given, so, use view ent att k stat
      Val_s==[],
      Val\==[],
      assert(real_ent_att_val(Val)).


update_ent_att_val(_V_name, _Ent_names, _Ent1_occ, _Ent_s,
                           _Att_names, Val, Val_s, _Real_val) :-

            % schema ent att k stat is not given and view ent att k stat
            % is given, so, use view ent att k stat
      multi_name_match(Val_s, Val),
      assert(real_ent_att_val(Val)).



      % both of rels atts values  are given, but different,
      % and ent att val previously recorded in history
update_ent_att_val(_V_name, Ent_names, _Ent1_occ, _Ent_s,
                           Att_names, Val, Val_s, _Real_val) :-

            % both of rels atts values  are given, but different
      Val_s\==[],
      Val\==[],

            % has this conflict been recorded in history,
            % if so, the history value is used
      hist_ent_att_val(Ent_names, Att_names, Val_h),
```

```
        assert_fact(real_ent_att_val(Val_h)).


update_ent_att_val(_V_name, Ent_names, _Ent1_occ, _Ent_s,
                        Att_names, Val, Val_s, _Real_val) :-

        Val_s\==[],
        Val\==[],
        ask_DBA_for_ent_att_val(V_name, Ent_names, Ent_occ, Att_names,
              Val, Val_s, Real_val, Reply),

              % investigate DBA values reply
        ent_att_val_confl_DBA_reply(V_name, Ent_names, Ent_occ,
              Att_names, Val, Val_s, Real_val, Reply).


update_ent_att_val(_, _, _, _, _, _, _, _).



        % a conflict in the two rels att values, which is not in the
        % history, then, the DBA is asked.

ask_DBA_for_ent_att_val(_V_name, Ent_names, _Ent_occ, Att_names,
              Val, Val_s, _Real_val, Reply) :-

        clear_screen, nl,
        write('CONFLICT between view and schema entity att values'),
        nl,
        write('entity name is :  '),
        write(Ent_names), nl,
        write('attribute  with conflict is:  '),
        write(Att_names), nl, nl,
        write('schema entity attribute has values :  '),
        write(Val_s), nl, nl,
        write('view entity attribute has values :  '),
        write(Val), nl, nl,
        write('Please do one of the following :'), nl, nl,
        write('     1.       Enter a new values'), nl,
        write('     2.    Type q or query to get information from the views or'),
        write(' schema'), nl,
        read(Reply).



        % DBA has given new values or requested information about
        % the views or schema to help him []ide.
ent_att_val_confl_DBA_reply(V_name, Ent_names, _Ent_occ,
              Att_names, Val, Val_s, _Real_val, Reply) :-
        (Reply==q;
        Reply==query),
        query,
                    % now ask the DBA again for a priority after his query
        ask_DBA_for_ent_att_val(V_name, Ent_names, _Ent_occ, Att_names,
              Val, Val_s, _Real_val, _).



        % DBA has given new values
        % This is difficult to check for correctness as att vals can be
        % anything
ent_att_val_confl_DBA_reply(_, Ent_names, _, Att_names, _, _, _, Reply) :-
        assert_fact(real_ent_att_val([Reply])),
        assert_fact(hist_ent_att_val(Ent_names, Att_names, [Reply])).
```

```
/*      Module : update_ent_rel_card                                          */
/*      Author : Mansoor Hassan                                               */
/*      Notes  : This module receives the cardinalities of the view ent_rel   */
/*               and the schema ent_rel. If the schema ent_rel has no card    */
/*               then it replaces it with the view ent_rel cardinality.       */
/*               If there is a conflict between the two cardinalitities       */
/*               then it tries the history records of a possible previous     */
/*               conflict. If no history of a previous conflict is given,     */
/*               then the DBA is asked to give a rsponse.                     */


:- dynamic real_ent_rel_card/1.

% hist_ent_rel_card(Rel_names, Ent_names, Card_h),

              %  If the ents cards dont match, then try the history records
              % If no history record of a previous conflict is given, then
              % ask the DBA, to resolve the conflict, and record this fact


update_ent_rel_card(_V_name, _Rel_names, _Rel_occ,
                    _Ent_names, _Ent_occ, Ent_card,
                    _Rel_names_s, _Ent_s, Ent_card_s) :-

              % equal ent cards, or view rel  ent cards is not given
              % then no change to schema rel  ent cards
       Ent_card== Ent_card_s,
       assert_fact(real_ent_rel_card(Ent_card_s)).


update_ent_rel_card(_V_name, _Rel_names, _Rel_occ,
                    _Ent_names, _Ent_occ, Ent_card,
                    _Rel_names_s, _Ent_s, Ent_card_s) :-

              % no view  ent cards is given, so no change
       Ent_card==[],
       assert_fact(real_ent_rel_card(Ent_card_s)).


update_ent_rel_card(_V_name, _Rel_names, _Rel_occ,
                    _Ent_names, _Ent_occ, Ent_card,
                    _Rel_names_s, _Ent_s, Ent_card_s) :-

              % no view  ent cards is given, so no change
       Ent_card==Ent_card_s,
       assert_fact(real_ent_rel_card(Ent_card_s)).


update_ent_rel_card(_V_name, _Rel_names, _Rel_occ,
                    _Ent_names, _Ent_occ, Ent_card,
                    _Rel_names_s, _Ent_s, Ent_card_s) :-

              % schema  ent cards is not given and view  ent cards
              % is given, so, use view  ent cards
       Ent_card_s==[],
       Ent_card\==[],
       assert(real_ent_rel_card(Ent_card)).


update_ent_rel_card(_V_name, Rel_names, _Rel_occ,
                    Ent_names, _Ent_occ, Ent_card,
                    _Rel_names_s, _Ent_s, Ent_card_s) :-

              % both of rels ent cards are given, but different
       Ent_card_s\==[],
       Ent_card\==[],
```

```
            % has this conflict been recorded in history,
            % if so, the history ent cards is used
        hist_ent_rel_card(Rel_names, Ent_names, Ent_card_h),
        assert(real_ent_rel_card(Ent_card_h)).


update_ent_rel_card(V_name, Rel_names, _Rel_occ,
                    Ent_names, _Ent_occ, Ent_card,
                    _Rel_names_s, _Ent_s, Ent_card_s) :-

            % both of rels ent cards are given, but different
        Ent_card_s\==[],
        Ent_card\==[],
        Ent_card_s\==Ent_card,
        ask_DBA_for_rel_ent_card(V_name, Rel_names, Rel_occ,
                    Ent_names, Ent_occ, Ent_card,
                    Rel_names_s, Ent_s, Ent_card_s, Reply),

            % investigate DBA ent cards reply
        rel_ent_card_confl_DBA_reply(V_name, Rel_names, Rel_occ,
                    Ent_names, Ent_occ, Ent_card,
                    Rel_names_s, Ent_s, Ent_card_s, Reply).




            % both cards are different, and no history of a previous
            % cardinality conflict, so ask the DBA
update_ent_rel_card(V_name, Rel_names, Rel_occ,
                    Ent_names, Ent_occ, Ent_card,
                    Rel_names_s, Ent_s, Ent_card_s) :-

        Ent_card_s\==[],
        Ent_card\==[],
        ask_DBA_for_rel_ent_card(V_name, Rel_names, Rel_occ,
                    Ent_names, Ent_occ, Ent_card,
                    Rel_names_s, Ent_s, Ent_card_s, Reply),

            % investigate DBA ent cards reply
        rel_ent_card_confl_DBA_reply(V_name, Rel_names, Rel_occ,
                    Ent_names, Ent_occ, Ent_card,
                    Rel_names_s, Ent_s, Ent_card_s, Reply).


update_ent_rel_card(_, _, _, _, _, _, _, _, _).


        % a conflict in the two rels  ent cards, which is not in the
        % history, then, the DBA is asked.
ask_DBA_for_rel_ent_card(V_name, Rel_names, _Rel_occ,
                    Ent_names, _Ent_occ, Ent_card,
                    _Rel_names_s, _Ent_s, Ent_card_s, Reply) :-

        clear_screen, nl,
        write('CONFLICT between view and schema relationship  ent cards'),
        nl, nl,
        write('view name is :  '),
        write(V_name), nl, nl,
        write('relationship name is :  '),
        write(Rel_names), nl, nl,
        write('entity name is :  '),
        write(Ent_names), nl, nl,

        write('schema relationship has ent cards :  '),
        write(Ent_card_s), nl, nl,
        write('view relationship has ent cards :  '),
```

```
        write(Ent_card), nl, nl,
        write('Please do one of the following :'), nl, nl,
        write('     1.       Enter a new ent cards'), nl,
        write('     2.    Type q or query to get information from the views or'),
        write(' schema'), nl,
        read(Reply).



        % DBA has given new ent cards or requested information about
        % the views or schema to help him []ide.
rel_ent_card_confl_DBA_reply(V_name, Rel_names, Rel_occ,
                    Ent_names, Ent_occ, Ent_card,
                    Rel_names_s, Ent_s, Ent_card_s, Reply) :-
        (Reply==q;
        Reply==query),
        query,
                    % now ask the DBA again for a priority after his query
        ask_DBA_for_rel_ent_card(V_name, Rel_names, Rel_occ,
                    Ent_names, Ent_occ, Ent_card,
                    Rel_names_s, Ent_s, Ent_card_s, Reply).



        % DBA has given new ent cards
        % At the moment no validation of his reply is carried out
rel_ent_card_confl_DBA_reply(_, Rel_names, _,
                        Ent_names, _, _, _, _, _, Reply) :-

        assert_fact(real_ent_rel_card(Reply)),
        assert_fact(hist_ent_rel_card(Rel_names, Ent_names, Reply)).
```

```
/*      Module : update_rel_att_key_stat                                    */
/*      Author : Mansoor Hassan                                             */
/*      Notes  : This module receives the key status of the same attribute  */
/*               of the view rel and the schema rel. It matches these two   */
/*               key status's. If thet dont match, the it asks the history  */
/*               records to see if such conflict was resolved previously    */
/*               by the DBA, otherwise it asks the DBA to decide a new key  */
/*               status and it assertys this fact in the history for any    */
/*               future conflicts.                                          */


      % decides the real att value between the view rel att
      % and schema rel att.
update_rel_att_k_stat(_, _, _, _, K_stat, K_stat_s, _Real_k_stat) :-

            % equal key stats, or view rel att key stat is not given
            % then no change to schema rel att key stat
      nonvar(K_stat),
      nonvar(K_stat_s),
      K_stat==K_stat_s,
      assert(real_rel_att_key_stat(K_stat_s)).


update_rel_att_k_stat(_V_name, _Rel_names, _Rel_occ, _Att_names,
            K_stat, K_stat_s, _Real_k_stat) :-

            % no view rel att k stat is given, so no change
      var(K_stat),
      assert(real_rel_att_key_stat(K_stat_s)).


update_rel_att_k_stat(_V_name, _Rel_names, _Rel_occ, _Att_names,
            K_stat, K_stat_s, _Real_k_stat) :-

            % schema rel att k stat is not given and view rel att k stat
            % is given, so, use view rel att k stat
      var(K_stat_s),
      nonvar(K_stat),
      assert(real_rel_att_key_stat(K_stat)).


update_rel_att_k_stat(_V_name, Rel_names, _Rel_occ, Att_names,
            K_stat, K_stat_s, _Real_k_stat) :-

            % both of rels k status are given, but different
      nonvar(K_stat_s),
      nonvar(K_stat),

            % has this conflict been recorded in history,
            % if so, the history k stat is used
      hist_rel_att_key_stat(Rel_names, Att_names, K_stat_h),
      real_key_stat(K_stat_h).


update_rel_att_k_stat(V_name, Rel_names, Rel_occ, Att_names,
            K_stat, K_stat_s, Real_k_stat) :-

      nonvar(K_stat_s),
      nonvar(K_stat),
      ask_DBA_for_rel_att_k_stat(V_name, Rel_names, Rel_occ, Att_names,
            K_stat, K_stat_s, Real_k_stat, Reply),

            % investigate DBA key status reply
      rel_att_k_stat_confl_DBA_reply(V_name, Rel_names, Rel_occ,
            Att_names, K_stat, K_stat_s, Real_k_stat, Reply).
```

```
update_rel_att_k_stat(_, _, _, _, _, _, _).


      % a conflict in the two rels att key status, which is not in the
      % history, then, the DBA is asked.
ask_DBA_for_rel_att_k_stat(_V_name, Rel_names, _Rel_occ, Att_names,
            K_stat, K_stat_s, _Real_k_stat, Reply) :-
      clear_screen, nl,
      write('CONFLICT between view and schema relationship att key status'),
      nl, nl,
      write('relationship name is :  '),
      write(Rel_names), nl,
      write('attribute  with conflict is:  '),
      write(Att_names), nl, nl, nl,
      write('schema relationship has key status :  '),
      write(K_stat_s), nl, nl,
      write('view relationship has key status :  '),
      write(K_stat), nl, nl, nl,
      write('Please do one of the following :'), nl, nl,
      write('     1.       Enter a new key status'), nl,
      write('     2.    Type q or query to get information from the views or'),
      write(' schema'), nl,
      read(Reply).



      % DBA has given new key status or requested information about
      % the views or schema to help him decide.
rel_att_k_stat_confl_DBA_reply(V_name, Rel_names, _Rel_occ,
            Att_names, K_stat, K_stat_s, _Real_k_stat, Reply) :-
      (Reply==q;
      Reply==query),
      query,
                  % now ask the DBA again for a priority after his query
      ask_DBA_for_rel_att_k_stat(V_name, Rel_names, _Rel_occ, Att_names,
            K_stat, K_stat_s, _Real_k_stat, Reply).



      % DBA has given new key status
rel_att_k_stat_confl_DBA_reply(_, Rel_names, _, Att_names, _, _, _, Reply) :-
      (Reply==key;
      Reply==notkey),
      assert(real_rel_att_key_stat(Reply)),
      assert(hist_rel_att_key_stat(Rel_names, Att_names, Reply)).


      % DBA has given incorrect key status
rel_att_k_stat_confl_DBA_reply(V_name, Rel_names, _Rel_occ,
            Att_names, K_stat, K_stat_s, _Real_k_stat, Reply) :-
      nl, nl, nl, nl,
      write('You have typed the wrong key status'), nl,
      write('Type either key or notkey'), nl,
      ask_DBA_for_rel_att_k_stat(V_name, Rel_names, _Rel_occ, Att_names,
            K_stat, K_stat_s, _Real_k_stat, Reply), !.
```

```
/*      Module : update_rel_att_val                                          */
/*      Author : Mansoor Hassan                                              */
/*      Notes  : This module receives the value of the same attribute        */
/*               of the view rel and the schema rel. It matches these two    */
/*               values. If they dont match, the it asks the history        */
/*               records to see if such conflict was resolved previously     */
/*               by the DBA, otherwise it asks the DBA to decide a new       */
/*               value and it assertys this fact in the history for any      */
/*               future conflicts.                                           */



      % decides the real att value between the view rel att
      % and schema rel att.

update_rel_att_val(_, _, _, _, Val, Val_s, _Real_val) :-

            % equal values, or view rel att value is not given
            % then no change to schema rel att value
      Val==[],
      Val_s==[],
      assert(real_rel_att_val(Val_s)).



update_rel_att_val(_, _, _, _, Val, Val_s, _Real_val) :-

            % equal values, or view rel att value is not given
            % then no change to schema rel att value
      multi_name_match(Val, Val_s),
      assert(real_rel_att_val(Val_s)).



update_rel_att_val(_V_name, _Rel_names, _Rel_occ, _Att_names,
            Val, Val_s, _Real_val) :-

            % no view rel att k stat is given, so no change
      Val==[],
      assert(real_rel_att_val(Val_s)).



update_rel_att_val(_V_name, _Rel_names, _Rel_occ, _Att_names,
            Val, Val_s, _Real_val) :-

            % schema rel att k stat is not given and view rel att k stat
            % is given, so, use view rel att k stat
      Val_s==[],
      Val\==[],
      assert(real_rel_att_val(Val)).


      % both of rels atts values  are given, but different,
      % and rel att val previously recorded in history
update_rel_att_val(_V_name, Rel_names, _Rel_occ, Att_names,
            Val, Val_s, _Real_val) :-

            % both of rels atts values  are given, but different
      Val_s\==[],
      Val\==[],

            % has this conflict been recorded in history,
            % if so, the history value is used
      hist_rel_att_val(Rel_names, Att_names, Val_h),
      assert_fact(real_rel_att_val(Val_h)).
```

```
update_rel_att_val(V_name, Rel_names, Rel_occ, Att_names,
            Val, Val_s, Real_val) :-

      Val_s\==[],
      Val\==[],
      ask_DBA_for_rel_att_val(V_name, Rel_names, Rel_occ, Att_names,
            Val, Val_s, Real_val, Reply),

            % investigate DBA values reply
      rel_att_val_confl_DBA_reply(V_name, Rel_names, Rel_occ,
            Att_names, Val, Val_s, Real_val, Reply).


update_rel_att_val(_, _, _, _, _, _, _).



      % a conflict in the two rels att values, which is not in the
      % history, then, the DBA is asked.

ask_DBA_for_rel_att_val(V_name, Rel_names, _Rel_occ, Att_names,
            Val, Val_s, _Real_val, Reply) :-

      clear_screen, nl,
      write('CONFLICT between view and schema relationship att values'),
      nl, nl,
      write('view name is :  '),
      write(V_name), nl,
      write('relationship name is :  '),
      write(Rel_names), nl,
      write('attribute  with conflict is:  '),
      write(Att_names), nl, nl,
      write('schema relationship attribute has values :  '),
      write(Val_s), nl, nl,
      write('view relationship attribute has values :  '),
      write(Val), nl, nl,
      write('Please do one of the following :'), nl, nl,
      write('    1.      Enter a new values'), nl,
      write('    2.   Type q or query to get information from the views or'),
      write(' schema'), nl,
      read(Reply).



      % DBA has given new values or requested information about
      % the views or schema to help him []ide.
rel_att_val_confl_DBA_reply(V_name, Rel_names, _Rel_occ,
            Att_names, Val, Val_s, _Real_val, Reply) :-
      (Reply==q;
      Reply==query),
      query,
                  % now ask the DBA again for a priority after his query
      ask_DBA_for_rel_att_val(V_name, Rel_names, _Rel_occ, Att_names,
            Val, Val_s, _Real_val, Reply).



      % DBA has given new values
      % This is difficult to check for correctness as att vals can be
      % anything
rel_att_val_confl_DBA_reply(_, Rel_names, _, Att_names, _, _, _, Reply) :-
      assert(real_rel_att_val([Reply])),
      assert(hist_rel_att_val(Rel_names, Att_names, [Reply])).
```

```
/*  Module   :      fuzzy_match_ents                                    */
/*  Notes    :      This module is initiated as a post integration task */
/*           It considers all the entities of the schema and            */
/*           calculates their fuzzy match level based on:               */
/*           1   Attributes names                                       */
/*           2   Attributes key status                                  */
/*           3   Attributes values                                      */
/*           4   Relationship names involving the two entities          */

:- use_module(library(math)).


%   f_slf_pa(E1, E2, Pa).     keeps the fuzzy match atts names of E1 & E2
%   f_slf_pk(E1, E2, Pk).     keeps the fuzzy match atts names of E1 & E2
%   f_slf_parE1, E2, Pr).     keeps the fuzzy match atts names of E1 & E2
%   f_slf_pa(E1, E2, Pa).     keeps the fuzzy match atts names of E1 & E2

:- dynamic tpa_no/1.
:- dynamic tpa_tot/1.
:- dynamic tpr_no/1.
:- dynamic tpr_tot/1.
:- dynamic no_of_above_pa_av/1.
:- dynamic no_of_above_pr_av/1.


fuzzy_process:-
      fuzzy_ents_all,
      categories.



list_slfs:-
      slf_weights(E1, E2, O, C, G, T1, T2, T3),
      write([E1, E2, '     ']),
      write([O, C, G, '    ']),
      write([T1, T2, T3]),
      fail.
list_slfs.


categories:-
      slf1_low_of_slf1(Slf1_L, Slf1_M),
      slf2_low_of_slf2(Slf2_L, Slf2_M),
      slf3_low_of_slf3(Slf3_L, Slf3_M),
      pa_low_of_pa(Pa_L, Pa_M),
      pk_low_of_pk(Pk_L, Pk_M),
      pr_low_of_pr(Pr_L, Pr_M),
      categories_list(Slf1_L, Slf1_M, Slf2_L, Slf2_M, Slf3_L, Slf3_M,
                      Pa_L, Pa_M, Pk_L, Pk_M, Pr_L, Pr_M).


categories_list(Slf1_L, Slf1_M, Slf2_L, Slf2_M, Slf3_L, Slf3_M,
                      Pa_L, Pa_M, Pk_L, Pk_M, Pr_L, Pr_M):-

      slf_weights(E1, E2, Pa, Pk, Pr, Slf1, Slf2, Slf3),

      categories_list_1(Slf1_L, Slf1_M, Slf2_L, Slf2_M, Slf3_L, Slf3_M,
                      Pa_L, Pa_M, Pk_L, Pk_M, Pr_L, Pr_M,
                     E1, E2, Pa, Pk, Pr, Slf1, Slf2, Slf3),
      fail.
categories_list(_, _, _, _, _, _, _, _, _, _, _, _).


categories_list_1(Slf1_L, Slf1_M, Slf2_L, Slf2_M, Slf3_L, Slf3_M,
                      Pa_L, Pa_M, Pk_L, Pk_M, Pr_L, Pr_M,
                     E1, E2, Pa, Pk, Pr, Slf1, Slf2, Slf3):-
```

```
            categories_list_2(Slf1_L, Slf1_M, Slf2_L, Slf2_M, Slf3_L, Slf3_M,
                    Pa_L, Pa_M, Pk_L, Pk_M, Pr_L, Pr_M,
                   E1, E2, Pa, Pk, Pr, Slf1, Slf2, Slf3),.
          !.


categories_list_2(Slf1_L, Slf1_M, Slf2_L, Slf2_M, Slf3_L, Slf3_M,
                    Pa_L, Pa_M, Pk_L, Pk_M, Pr_L, Pr_M,
                   E1, E2, Pa, Pk, Pr, Slf1, Slf2, Slf3):-

      cat_pa(Pa, Pa_L, Pa_M, Pa_cat),
      cat_pr(Pr, Pr_L, Pr_M, Pr_cat),
      cat_pk(Pk, Pk_L, Pk_M, Pk_cat),
      cat_slf1(Slf1, Slf1_L, Slf1_M, Slf1_cat),
      cat_slf1(Slf2, Slf2_L, Slf2_M, Slf2_cat),
      cat_slf1(Slf3, Slf3_L, Slf3_M, Slf3_cat),
      nl,
      write([E1, E2,': ',       Pa_cat, Pa,
                         Pk_cat, Pk,
                         Pr_cat,      Pr,
                         '   ', Slf1_cat, Slf1,
                         Slf2_cat, Slf2,
                         Slf3_cat, Slf3]).


cat_pa(Pa, Pa_L, _Pa_M, Pa_cat):-
          Pa < Pa_L, Pa_cat = 'L: '.

cat_pa(Pa, _Pa_L, Pa_M, Pa_cat):-
          Pa < Pa_M, Pa_cat = 'M: '.

cat_pa(Pa, _Pa_L, Pa_M, Pa_cat):-
          Pa > Pa_M, Pa_cat = 'H: '.


cat_pk(Pk, Pk_L, _Pk_M, Pk_cat):-
          Pk < Pk_L, Pk_cat = 'L: '.

cat_pk(Pk, _Pk_L, Pk_M, Pk_cat):-
          Pk < Pk_M, Pk_cat = 'M: '.

cat_pk(Pk, _Pk_L, Pk_M, Pk_cat):-
          Pk > Pk_M, Pk_cat = 'H: '.


cat_pr(Pr, Pr_L, _Pr_M, Pr_cat):-
          Pr < Pr_L, Pr_cat = 'L: '.

cat_pr(Pr, _Pr_L, Pr_M, Pr_cat):-
          Pr < Pr_M, Pr_cat = 'M: '.

cat_pr(Pr, _Pr_L, Pr_M, Pr_cat):-
          Pr > Pr_M, Pr_cat = 'H: '.


cat_slf1(Slf1, Slf1_L, _Slf1_M, Slf1_cat):-
          Slf1 < Slf1_L, Slf1_cat = 'L: '.

cat_slf1(Slf1, _Slf1_L, Slf1_M, Slf1_cat):-
          Slf1 < Slf1_M, Slf1_cat = 'M: '.

cat_slf1(Slf1, _Slf1_L, Slf1_M, Slf1_cat):-
          Slf1 > Slf1_M, Slf1_cat = 'H: '.
```

```
cat_slf2(Slf2, Slf2_L, _Slf2_M, Slf2_cat):-
          Slf2 < Slf2_L, Slf2_cat = 'L: '.

cat_slf2(Slf2, _Slf2_L, Slf2_M, Slf2_cat):-
          Slf2 < Slf2_M, Slf2_cat = 'M: '.

cat_slf2(Slf2, _Slf2_L, Slf2_M, Slf2_cat):-
          Slf2 > Slf2_M, Slf2_cat = 'H: '.



cat_slfv3(Slf3, Slf3_L, _Slf3_M, Slf3_cat):-
          Slf3 < Slf3_L, Slf3_cat = 'L: '.

cat_slf3(Slf3, _Slf3_L, Slf3_M, Slf3_cat):-
          Slf3 < Slf3_M, Slf3_cat = 'M: '.

cat_slf3(Slf3, _Slf3_L, Slf3_M, Slf3_cat):-
          Slf3 > Slf3_M, Slf3_cat = 'H: '.



slf1_low_of_slf1(L, M):-
       assert(slf1_tot(0)),
       assert(slf1_no(0)),
       slf1_av1,
       slf1_av3_low(L),
       slf1_av3_medium(L, M),
       nl, nl, nl,
       write(['SLF1 Low is: ', L]),
       write(['SLF1 Medium is: ', M]).



slf1_av1:-
       slf_weights(_, _, _, _, _, T, _, _),
       slf1_av2(T),
       fail.
slf1_av1.

slf1_av2(T):-
       add_slf1_tot(T),
       add_slf1_no,
       !.

slf1_av3_low(L):-
       retract(slf1_tot(T)),
       retract(slf1_no(N)),
       L is T / N.



slf1_av3_medium(L, M):-
       assert(slf1_tot(0)),
       assert(slf1_no(0)),
       slf1_av3_medium_1(L),
       slf1_av3_medium_3(M).



slf1_av3_medium_1(L):-
       slf_weights(_, _, _, _, _, T, _, _),
       slf1_av3_medium_2(L, T),
       fail.
slf1_av3_medium_1(_).
```

```
slf1_av3_medium_2(L, T):-
        T > L,
        add_slf1_tot(T),
        add_slf1_no,
        !.
slf1_av3_medium_2(_, _).


slf1_av3_medium_3(M):-
        retract(slf1_tot(T)),
        retract(slf1_no(N)),
        M is T / N.




slf2_low_of_slf2(L, M):-
        assert(slf2_tot(0)),
        assert(slf2_no(0)),
        slf2_av1,
        slf2_av3_low(L),
        slf2_av3_medium(L, M),
        nl, nl, nl,
        write(['SLF2 Low is: ', L]),
        write(['SLF2 Medium is: ', M]).

slf2_av1:-
        slf_weights(_, _, _, _, _, _, T, _),
        slf2_av2(T),
        fail.
slf2_av1.

slf2_av2(T):-
        add_slf2_tot(T),
        add_slf2_no,
        !.

slf2_av3_low(L):-
        retract(slf2_tot(T)),
        retract(slf2_no(N)),
        L is T / N.


slf2_av3_medium(L, M):-
        assert(slf2_tot(0)),
        assert(slf2_no(0)),
        slf2_av3_medium_1(L),
        slf2_av3_medium_3(M).


slf2_av3_medium_1(L):-
        slf_weights(_, _, _, _, _, _, T, _),
        slf2_av3_medium_2(L, T),
        fail.
slf2_av3_medium_1(_).


slf2_av3_medium_2(L, T):-
        T > L,
        add_slf2_tot(T),
        add_slf2_no,
        !.
```

```
slf2_av3_medium_2(_, _).


slf2_av3_medium_3(M):-
        retract(slf2_tot(T)),
        retract(slf2_no(N)),
        M is T / N.



slf3_low_of_slf3(L, M):-
        assert(slf3_tot(0)),
        assert(slf3_no(0)),
        slf3_av1,
        slf3_av3_low(L),
        slf3_av3_medium(L, M),
        nl, nl, nl,
        write(['SLF3 Low is: ', L]),
        write(['SLF3 Medium is: ', M]).

slf3_av1:-
        slf_weights(_, _, _, _, _, _, _, T),
        slf3_av2(T),
        fail.
slf3_av1.

slf3_av2(T):-
        add_slf3_tot(T),
        add_slf3_no,
        !.

slf3_av3_low(L):-
        retract(slf3_tot(T)),
        retract(slf3_no(N)),
        L is T / N.



slf3_av3_medium(L, M):-
        assert(slf3_tot(0)),
        assert(slf3_no(0)),
        slf3_av3_medium_1(L),
        slf3_av3_medium_3(M).



slf3_av3_medium_1(L):-
        slf_weights(_, _, _, _, _, _, _, T),
        slf3_av3_medium_2(L, T),
        fail.
slf3_av3_medium_1(_).



slf3_av3_medium_2(L, T):-
        T > L,
        add_slf3_tot(T),
        add_slf3_no,
        !.
slf3_av3_medium_2(_, _).



slf3_av3_medium_3(M):-
        retract(slf3_tot(T)),
        retract(slf3_no(N)),
        M is T / N.
```

```
pa_low_of_pa(L, M):-
        assert(pa_tot(0)),
        assert(pa_no(0)),
        pa_av1,
        pa_av3_low(L),
        pa_av3_medium(L, M),
        nl, nl, nl,
        write(['Pa Low is: ', L]),
        write(['Pa Medium is: ', M]).

pa_av1:-
        slf_weights(_, _, T, _, _, _,  _, _),
        pa_av2(T),
        fail.
pa_av1.

pa_av2(T):-
        add_pa_tot(T),
        add_pa_no,
        !.

pa_av3_low(L):-
        retract(pa_tot(T)),
        retract(pa_no(N)),
        L is T / N.


pa_av3_medium(L, M):-
        assert(pa_tot(0)),
        assert(pa_no(0)),
        pa_av3_medium_1(L),
        pa_av3_medium_3(M).


pa_av3_medium_1(L):-
        slf_weights(_, _, T, _, _, _,  _, _),
        pa_av3_medium_2(L, T),
        fail.
pa_av3_medium_1(_).


pa_av3_medium_2(L, T):-
        T > L,
        add_pa_tot(T),
        add_pa_no,
        !.
pa_av3_medium_2(_, _).


pa_av3_medium_3(M):-
        retract(pa_tot(T)),
        retract(pa_no(N)),
        M is T / N.



pk_low_of_pk(L, M):-
        assert(pk_tot(0)),
        assert(pk_no(0)),
        pk_av1,
        pk_av3_low(L),
```

```
        pk_av3_medium(L, M),
        nl, nl, nl,
        write(['Pk Low is: ', L]),
        write(['Pk Medium is: ', M]).

pk_av1:-
        slf_weights(_, _, _, T, _, _, _, _),
        pk_av2(T),
        fail.
pk_av1.

pk_av2(T):-
        add_pk_tot(T),
        add_pk_no,
        !.

pk_av3_low(L):-
        retract(pk_tot(T)),
        retract(pk_no(N)),
        L is T / N.


pk_av3_medium(L, M):-
        assert(pk_tot(0)),
        assert(pk_no(0)),
        pk_av3_medium_1(L),
        pk_av3_medium_3(M).


pk_av3_medium_1(L):-
        slf_weights(_, _, _, T, _, _, _, _),
        pk_av3_medium_2(L, T),
        fail.
pk_av3_medium_1(_).


pk_av3_medium_2(L, T):-
        T > L,
        add_pk_tot(T),
        add_pk_no,
        !.
pk_av3_medium_2(_, _).


pk_av3_medium_3(M):-
        retract(pk_tot(T)),
        retract(pk_no(N)),
        M is T / N.


pr_low_of_pr(L, M):-
        assert(pr_tot(0)),
        assert(pr_no(0)),
        pr_av1,
        pr_av3_low(L),
        pr_av3_medium(L, M),
        nl, nl, nl,
        write(['Pr Low is: ', L]),
        write(['Pr Medium is: ', M]).

pr_av1:-
        slf_weights(_, _, _, _, T, _, _, _),
        pr_av2(T),
        fail.
pr_av1.
```

```
pr_av2(T):-
        add_pr_tot(T),
        add_pr_no,
        !.

pr_av3_low(L):-
        retract(pr_tot(T)),
        retract(pr_no(N)),
        L is T / N.



pr_av3_medium(L, M):-
        assert(pr_tot(0)),
        assert(pr_no(0)),
        pr_av3_medium_1(L),
        pr_av3_medium_3(M).



pr_av3_medium_1(L):-
        slf_weights(_, _, _, _, T, _,  _, _),
        pr_av3_medium_2(L, T),
        fail.
pr_av3_medium_1(_).



pr_av3_medium_2(L, T):-
        T > L,
        add_pr_tot(T),
        add_pr_no,
        !.
pr_av3_medium_2(_, _).



pr_av3_medium_3(M):-
        retract(pr_tot(T)),
        retract(pr_no(N)),
        M is T / N.



    % The folowing predicates produce the total similarity factors
    % for entities, based on the individual similarity factors
    % of their attribute names, key attribute names, and relationships.
    % The total similarity factor is P, and it is based on Pa, Pk, Pr.
    % The calculation of P is done for each entity separately.
    % The proces of finding P is started by calling the predicate
    % fuzzy_ents_all.

fuzzy_ents_all:-
        nl, nl, nl,
        write('You have requested to calculate the Similarity Level Factors'),
        nl,
        write('In order to find the fuzzy matching levels of the GCS
               entities,'), nl,
        write('the individual similarity level factors for:  '), nl,
        write('attributes names Pa, key attribute namesPk, '), nl,
        write('and relationship names'),
        nl, nl,
        write('In order to calculate the weight each of Pa, Pk, and Pr'), nl,
        write('plays in calculating P, you must enter the weights for '), nl,
        write('each of these'), nl, nl,
        write('ENTER the weight for Pa:  '),
        read(W1pa), nl, nl,
        write('ENTER the weight for Pk:  '),
        read(W1pk), nl, nl,
```

```
        write('ENTER the weight for Pr:  '),
        read(W1pr), nl, nl,


        nl, nl,
        write('In order to calculate the weight each of Pa, Pk, and Pr'), nl,
        write('plays in calculating P, you must enter the weights for '), nl,
        write('each of these'), nl, nl,
        write('ENTER the weight for Pa:  '),
        read(W2pa), nl, nl,
        write('ENTER the weight for Pk:  '),
        read(W2pk), nl, nl,
        write('ENTER the weight for Pr:  '),
        read(W2pr), nl, nl,

        nl, nl,
        write('In order to calculate the weight each of Pa, Pk, and Pr'), nl,
        write('plays in calculating P, you must enter the weights for '), nl,
        write('each of these'), nl, nl,
        write('ENTER the weight for Pa:  '),
        read(W3pa), nl, nl,
        write('ENTER the weight for Pk:  '),
        read(W3pk), nl, nl,
        write('ENTER the weight for Pr:  '),
        read(W3pr), nl, nl,

        fuzzy_ents_all_1(W1pa, W1pk, W1pr, W2pa, W2pk, W2pr,
                         W3pa, W3pk, W3pr).


fuzzy_ents_all_1(W1pa, W1pk, W1pr, W2pa, W2pk, W2pr,
                         W3pa, W3pk, W3pr):-
        ent_names_s(E1, _),
        find_SLF(E1, W1pa, W1pk, W1pr, W2pa, W2pk, W2pr,
                         W3pa, W3pk, W3pr),   % SLF=Similarity level factor
        fail.
fuzzy_ents_all_1(_, _, _, _, _, _, _, _, _).


find_SLF(E1, W1pa, W1pk, W1pr, W2pa, W2pk, W2pr,
                         W3pa, W3pk, W3pr):-
        find_SLF_1(E1,W1pa, W1pk, W1pr, W2pa, W2pk, W2pr,
                         W3pa, W3pk, W3pr), !.


find_SLF_1(E1, W1pa, W1pk, W1pr, W2pa, W2pk, W2pr,
                         W3pa, W3pk, W3pr):-
        ent_names_s(E2, _),
        find_SLF_2(E1, E2, W1pa, W1pk, W1pr, W2pa, W2pk, W2pr,
                         W3pa, W3pk, W3pr),
        fail.
find_SLF_1(_, _, _, _, _, _, _, _, _, _).


find_SLF_2(E1, E2, W1pa, W1pk, W1pr, W2pa, W2pk, W2pr,
                         W3pa, W3pk, W3pr):-
        find_SLF_3(E1, E2, W1pa, W1pk, W1pr, W2pa, W2pk, W2pr,
                         W3pa, W3pk, W3pr), !.


find_SLF_3(E1, E2, W1pa, W1pk, W1pr, W2pa, W2pk, W2pr,
                         W3pa, W3pk, W3pr):-
        f_att_names(E1, E2, Pa),
        f_att_keys(E1, E2, Pk),
        f_ent_rels(E1, E2, Pr),

        M is Pa * 100,
        W is M + 0.5,
```

```
        N is integer(W),
        O is N / 100,

        S is Pk * 100,
        X is S + 0.5,
        B is integer(X),
        C is B / 100,

        E is Pr * 100,
        Y is E + 0.5,
        F is integer(Y),
        G is F / 100,


        pow(O, W1pa, AA1),
        pow(O, W2pa, AA2),
        pow(O, W3pa, AA3),

        pow(C, W1pk, BB1),
        pow(C, W2pk, BB2),
        pow(C, W3pk, BB3),

        pow(G, W1pr, CC1),
        pow(G, W2pr, CC2),
        pow(G, W3pr, CC3),


        P1 is AA1 * BB1 * CC1,
        P2 is AA2 * BB2 * CC2,
        P3 is AA3 * BB3 * CC3,
/*

        P1 is W1pa * O + W1pk * C + W1pr * G,
        P2 is W2pa * O + W2pk * C + W2pr * G,
        P3 is W3pa * O + W3pk * C + W3pr * G,

*/
        R1 is P1 * 100,
        V1 is R1 + 0.5,
        A1 is integer(V1),
        T1 is A1 / 100,


        R2 is P2 * 100,
        V2 is R2 + 0.5,
        A2 is integer(V2),
        T2 is A2 / 100,


        R3 is P3 * 100,
        V3 is R3 + 0.5,
        A3 is integer(V3),
        T3 is A3 / 100,


        assertz(slf_weights(E1, E2, O, C, G, T1, T2, T3)).

abc:-
     retract(slf_weights(E1, E2, O, C, G, T1, T2, T3)),
     fail.


f_att_names(E1, E2, Pa):-
        \+ E1=E2,
        fuzzy_ent_att_names(E1, E2, Pa).


f_att_keys(E1, E2, Pk):-
        \+ E1=E2,
        fuzzy_ent_att_keys(E1, E2, Pk).
```

```
f_ent_rels(E1, E2, Pr):-
       \+ E1=E2,
       fuzzy_ent_rels(E1, E2, Pr).



    % The following predicates find the similarity level factors
    % for all the entities, based on:
    % their attribute names, then on their key attributes, then
    % on their relationships.
    % The process is initiated by calling the first predicte
    % (fuzzy_match_ents)


          % to ensure no previous values from previous runs.
initialize:-
       retract(tpa_no(_)),
       retract(tpa_tot(_)),
       retract(tpr_no(_)),
       retract(tpr_tot(_)).
initialize.


fuzzy_match_separate:-
       initialize,
       assert(tpa_no(0)),
       assert(tpa_tot(0)),
       assert(tpr_no(0)),
       assert(tpr_tot(0)),
       fuzzy_match_ents.


fuzzy_match_ents :-
       ent_names_s(E1, _),
       fuzzy_ents_1(E1),
       fail.

fuzzy_match_ents:-
       retract(tpa_no(N)),
       retract(tpa_tot(T)),
       nl, nl,
       write('The average SLF (Pa) of fuzzy matching all entities '),
       write('based on the attribute names only is:  '),
       Av is T / N,
       write(Av), nl, nl, nl,
       retract(tpr_no(A)),
       retract(tpr_tot(B)),
       write('The average SLF (Pr) of fuzzy matching all entities '),
       write('based on the relationships names only, is:  '),
       Av is B / A,
       write(Av), nl.

fuzzy_ents_1(E1) :-
    nl, nl,
     write(['The following fuzzy match results of entities was based on']), nl,
     write(['the matching of the two entities on the attribute names ']),
    nl, nl,

     fuzzy_ents_att_names_2(E1),

    nl, nl,
     write(['The following fuzzy match results of entities was based on']), nl,
     write(['the matching of the two entities on the KEY attribute names ']),
    nl, nl,
```

```
     fuzzy_ents_att_keys_2(E1),


     write(['The following fuzzy match results of entities was base on']), nl,
     write(['the matching of the relationships involving the two entities ']),
    nl, nl,

     fuzzy_ents_rels_2(E1),
    !.



fuzzy_ents_att_names_2(E1)  :-
     ent_names_s(E2, _),
     fuzzy_match_att_names_3(E1, E2),
    fail.
fuzzy_ents_att_names_2(_).



fuzzy_match_att_names_3(E1, E2)  :-
     fuzzy_match_att_names_4(E1, E2),
    !.

fuzzy_match_att_names_4(E1, E2)  :-
     \+ E1=E2,
     fuzzy_ent_att_names(E1, E2, Pa),
     assert(f_slf_pa(E1, E2, Pa)),
     add_one_pa_no,       % add 1 to number of matches
     add_one_pa_tot(Pa).        % add pa total Pa to get average later
fuzzy_match_att_names_4(_, _).



fuzzy_ents_att_keys_2(E1)  :-
     ent_names_s(E2, _),
     fuzzy_match_att_keys_3(E1, E2),
    fail.
fuzzy_ents_att_keys_2(_).



fuzzy_match_att_keys_3(E1, E2)  :-
     fuzzy_match_att_keys_4(E1, E2),
    !.

fuzzy_match_att_keys_4(E1, E2)  :-
     \+ E1=E2,
     fuzzy_ent_att_keys(E1, E2, Pk),
     assert(f_slf_pk(E1, E2, Pk)).


fuzzy_ents_rels_2(E1)  :-
     ent_names_s(E2, _),
     fuzzy_match_rels_3(E1, E2),
    fail.
fuzzy_ents_rels_2(_).



fuzzy_match_rels_3(E1, E2)  :-
     fuzzy_match_rels_4(E1, E2),
    !.

fuzzy_match_rels_4(E1, E2)  :-
     \+ E1=E2,
     fuzzy_ent_rels(E1, E2, Pr),
     assert(f_slf_pr(E1, E2, Pr)),
     add_one_pr_no,
     add_one_pr_tot(Pr).
```

```
fuzzy_match_rels_4(_, _).


fuzzy_ent_att_names(E1, E2, Pa) :-
     setof(A1, ent_att_names(E1, A1), E1A),
     setof(A2, ent_att_names(E2, A2), E2A),
     is_set(E1A),
     is_set(E2A),
     intersection(E1A, E2A, S1),
     union(E1A, E2A, S2),
     proper_length(S1, L1),
     proper_length(S2, L2),
     Pa is L1/L2.


fuzzy_ent_att_keys(E1, E2, Pk) :-
     setof(A1, ent_att_det_s(E1, att(A1, _, key, _)), E1K),
     setof(A2, ent_att_det_s(E2, att(A2, _, key, _)), E2K),
     is_set(E1K),
     is_set(E2K),
     intersection(E1K, E2K, S1),
     union(E1K, E2K, S2),
     proper_length(S1, L1),
     proper_length(S2, L2),
     Pk is L1/L2.



fuzzy_ent_rels(E1, E2, Pr) :-
     setof(R1, rel_involves_ent(E1, R1), Rset1),
     setof(R2, rel_involves_ent(E2, R2), Rset2),
     is_set(Rset1),
     is_set(Rset2),
     intersection(Rset1, Rset2, S1),
     union(Rset1, Rset2, S2),
     proper_length(S1, L1),
     proper_length(S2, L2),
     Pr is L1/L2.



fuzzy_att_vals(E1, E2, Pv) :-
     setof(V1, non_empty_vals(E1, V1), Vset1),
     setof(V2, non_empty_vals(E2, V2), Vset2),
     is_set(Vset1),
     is_set(Vset2),
     intersection(Vset1, Vset2, S1),
     union(Vset1, Vset2, S2),
     proper_length(S1, L1),
     proper_length(S2, L2),
     Pv is L1/L2,
     nl, nl,
     write(['ENTITY 1   ', E1, 'ATTRIBUTES   ',Vset1]), nl,
     write(['ENTITY 2   ', E2, 'ATTRIBUTES   ', Vset2]), nl,
     write([' fuzzy factor   ', Pv]), nl, nl.


non_empty_vals(E1, V1) :-
     ent_att_det_s(E1, att(A1, V1, _, _)),
     \+ V1=[].



/*****************************************************************
*/
```

```
        %    adds Pa to the total of all  Pa's, in order to get the average Pa
        %    later.
add_slf1_tot(SLF):-
        retract(slf1_tot(S)),
        T is S + SLF,
        assert(slf1_tot(T)).
add_slf1_tot(_).



        %    adds Pa to the total of all  Pa's, in order to get the average Pa
        %    later.
add_slf1_no:-
        retract(slf1_no(S)),
        T is S + 1,
        assert(slf1_no(T)).
add_slf1_no.



        %    adds Pa to the total of all  Pa's, in order to get the average Pa
        %    later.
add_slf2_tot(SLF):-
        retract(slf2_tot(S)),
        T is S + SLF,
        assert(slf2_tot(T)).
add_slf2_tot(_).



        %    adds Pa to the total of all  Pa's, in order to get the average Pa
        %    later.
add_slf2_no:-
        retract(slf2_no(S)),
        T is S + 1,
        assert(slf2_no(T)).
add_slf2_no.



        %    adds Pa to the total of all  Pa's, in order to get the average Pa
        %    later.
add_slf3_tot(SLF):-
        retract(slf3_tot(S)),
        T is S + SLF,
        assert(slf3_tot(T)).
add_slf3_tot(_).



        %    adds Pa to the total of all  Pa's, in order to get the average Pa
        %    later.
add_slf3_no:-
        retract(slf3_no(S)),
        T is S + 1,
        assert(slf3_no(T)).
add_slf3_no.
```

```
        %    adds Pa to the total of all  Pa's, in order to get the average Pa
        %    later.
add_pa_tot(SLF):-
        retract(pa_tot(S)),
        T is S + SLF,
        assert(pa_tot(T)).
add_pa_tot(_).



        %    adds Pa to the total of all  Pa's, in order to get the average Pa
        %    later.
add_pa_no:-
        retract(pa_no(S)),
        T is S + 1,
        assert(pa_no(T)).
add_pa_no.



        %    adds Pa to the total of all  Pa's, in order to get the average Pa
        %    later.
add_pk_tot(SLF):-
        retract(pk_tot(S)),
        T is S + SLF,
        assert(pk_tot(T)).
add_pk_tot(_).



        %    adds Pa to the total of all  Pa's, in order to get the average Pa
        %    later.
add_pk_no:-
        retract(pk_no(S)),
        T is S + 1,
        assert(pk_no(T)).
add_pk_no.



        %    adds Pa to the total of all  Pa's, in order to get the average Pa
        %    later.
add_pr_tot(SLF):-
        retract(pr_tot(S)),
        T is S + SLF,
        assert(pr_tot(T)).
add_pr_tot(_).



        %    adds Pa to the total of all  Pa's, in order to get the average Pa
        %    later.
add_pr_no:-
```

```
        retract(pr_no(S)),
        T is S + 1,
        assert(pr_no(T)).
add_pr_no.



/*********************************************************************
This section accumulates a list of SLF values for different weights.
However, it had two problems, which made me leave it:
    1  It was too slow
    2  It does not work for lists of approx. 2500 elements, which is what I
       have

    Also,
    The bagof command did not work for large solutions

ls:-
    assert(l([])),
    ls1,
    retract(l(L)),
    write(L).
ls.


ls1:-
    slf_weights(_, _, _, _, _, T,  _, _),
    ls2(T),
    fail.

ls2(T):-
    ls3(T), !.

ls3(T):-
    retract(l(L)),
    append(L, [T], L1), nl, nl, nl, write(L1),
    assert(l(L1)).



stats:-
        bagof(T, slf_weights(_, _, _, _, _, T,  _, _), S),
        write(S),
        stat1(S).

stat1(SLF1_list):-
        sort(SLF1_list, SLF1_l),
        length(SLF1_l, SLF1_length),
        A is SLF1_length / 2,
        A1 is integer(A),
        nth1(A1, SLF1_l, SLF_low),
        write(SLF_low).
*********************************************************************/
```

```
/*  Module  :       query                                                   */
/*          This module is an interface to the modules:                     */
/*          query_views    and     query_schema.                            */
/*          It requests from the user to                                    */
query :-
      clear_screen,
      write('You have requested to query the semantics of either '), nl,
      write('the views or the schema'), nl,
      write('Please request one of the following:'), nl, nl,
      write('      1    Query the views'), nl,
      write('      2    Query the schema'), nl,
      write('      n    To stop querying'), nl, nl,
      read(R),
      query_1(R).

query_1(1):-
      query_views,
      query.


query_1(2):-
      query_schema,
      query.


query_1(n).

query_1(_):-
      query.
```

```
/*                                                                    */
/*      Module : query_schema                                         */
/*      Author : Mansoor Hassan                                       */
/*      Notes  : This module retrieves any kind of information        */
/*               about the global schema                              */
/*               and the individual user views.                       */


/*
att_names_s([Att_names]).
rel_names_s([Rel_names], Prio).
ent_names_s([Ent_names], Prio).
ent_att_names([Ent_names], [Att_names]).
rel_att_names_s([Rel_names], [Att_names]).
ent_att_det_s([Ent_names], att([Att_names], [Vals], K_stat, Prio)).
rel_att_det_s([Rel_names], att([Att_names], [Vals], K_stat, Prio)).
ent_rel_s(ent1([Ent_names], [Cards], [Stat]),
             rel([Rel_names]),
       ent2([Ent_names], [Cards], [Stat])).
*/


%      The following predicates are for querying the contents of the
%      individual user views.


query_schema:-
       nl, nl, nl,
       write('You have requested to query the contents of the schema.'),nl,
       write('Below is a list of the queries you can make.'), nl,
       write('Please type the of the query, followed by a .'),
       nl, nl,
       write('1     List all relationship names in the schema'), nl,
       write('2     List entities involved in a given relationship'), nl,
       write('3     List all entity-relationships-without their attributes'),
                 nl,
       write('4     List all entity-relationships in the schema'), nl,
       write('5     List all attributes in the schema'), nl,
       write('6     List attributes of a given entity'), nl,
       write('7     List key attributes of a given entity'), nl,

       write('n     To end the querying of the schema'), nl,
       nl,
       read(Q),
       query_schema_1(Q).
query_schema.


query_schema_1(1):-
       rels_names_in_schema,
       pause,
       query_schema.


query_schema_1(2):-
       ents_in_schema_rel,
       pause,
       query_schema.

query_schema_1(3):-
       all_rels,
       pause,
       query_schema.

query_schema_1(4):-
       show_schema,
       pause,
       query_schema.
```

```
query_schema_1(5):-
      all_atts,
      pause,
      query_schema.

query_schema_1(6):-
      atts_of_chosen_ent,
      pause,
      query_schema.

query_schema_1(7):-
      key_atts_of_sch_ent,
      pause,
      query_schema.

query_schema_1(n).


query_schema_1(_):-
      pause,
      query_schema.



      % Finds all the relationships in the main schema
rels_names_in_schema:-
      rel_names_s(Rel_names, _), nl,
      write('Relationship      '),
      write(Rel_names), nl,
      fail.
rels_names_in_schema.



%     Finds the entities  involved in a relationship in the schema

ents_in_schema_rel:-
      nl, nl, nl,
      write('You have requested to list all entities involved in a give'),
      write(' relationship'), nl, nl,
      write('Please enter the relationship name: '),
      read(Rel_names), nl,
      write('The following entities are involved in relationship  '),
      write(Rel_names), nl,
      ents_in_schema_rel_1(Rel_names).


ents_in_schema_rel_1(Rel_names):-

            % extract the entities of next schema rel with given name
      ent_rel_s(ent1(Ent1_names, _, _),
            rel(Rel_names),
      ent2(Ent2_names, _, _)),

      write(Ent1_names),
      write('   and   '),
      write(Ent2_names), nl,
      fail.
ents_in_schema_rel_1(_Rel_names).



%     Finds the cardinalities of entities in a relationship
cardinalities(Rel):-
      nl,
      write('The cardinalities of the entities in relationship '),
      write(Rel),
      fail.
```

```
cardinalities(Rel):-

            % extract the entities of next schema rel with given name
      ent_rel_s(ent1(Ent1_names, Ent1_cards, _),
            rel(Rel),
      ent2(Ent2_names, Ent2_cards, _)),
      nl,
      write(Ent1_names),
      write(' '),
      write(Ent1_cards),
      write('   and   '), nl,
      write(Ent2_names),
      write('   '),
      write(Ent2_cards), nl,
      fail.
cardinalities(_Rel).



%     Finds the cardinalities of entities in all the relationships in schema
cardinalities:-
      nl,
      write('The cardinalities of the entities in all rels in schema'),nl,
      write('-----------------------------------------------------'),
      nl,
      fail.

cardinalities:-
            % extract the entities of next schema rel with given name
      ent_rel_s(ent1(Ent1_names, Ent1_cards, _),
            rel(Rel),
      ent2(Ent2_names, Ent2_cards, _)),
      nl,
      write('Relationship name is :   '),
      write(Rel), nl,
      write(Ent1_names),
      write(' '),
      write(Ent1_cards),
      write('   and   '), nl,
      write(Ent2_names),
      write('   '),
      write(Ent2_cards), nl,
      fail.
cardinalities.



      % Finds the attribute names of a given entity in the schema
atts_of_schema_ent(Ent):-
      nl, nl,
      write('The entity '),
      write(Ent),
      write('  has the following attributes:'), nl,
      fail.

atts_of_schema_ent(Ent):-
            % extract the next attribute of the entity
      ent_att_names(Ent, Att_names),
      write(Att_names), nl,
      fail.
atts_of_schema_ent(_Ent_names).



key_atts_of_sch_ent:-
```

```
        nl, nl,
        write('-------------------------------------------------------'),
        nl, nl,
        write('You have requested to look at the key attributes'), nl,
        write('of a given entity in the schema'), nl, nl,
        write('Please enter the entity name: '),
        read(Ent),
        key_atts_of_sch_ent_1(Ent).

            % Find the key attributes of a given entity in the schema
key_atts_of_sch_ent_1(Ent)  :-
        nl, nl,
        write('The entity '),
        write(Ent),
        write('  has the following key attributes:'), nl,
        key_atts_of_sch_ent_2(Ent).


key_atts_of_sch_ent_2(Ent)  :-
                    % extract the next key attribute of the entity
        ent_att_det_s(Ent, att(Att, _, key, _)),
        write(Att), nl,
        fail.

key_atts_of_sch_ent_2(_).



            % Find the notkey attributes of a given entity in the schema
notkey_atts_of_sch_ent(Ent)  :-
        nl, nl,
        write('The entity '),
        write(Ent),
        write('  has the following notkey attributes:'), nl,
        fail.


notkey_atts_of_sch_ent(Ent)  :-
                    % extract the next key attribute of the entity
        ent_att_det_s(Ent, att(Att, _, notkey, _)),
        write(Att), nl,
        fail.

notkey_atts_of_sch_ent(_).



        %  all the entities in the schema with the given attribute
ents_with_given_att(Att_name):-
        nl, nl, nl,
        write(' The entities with the attribute:'),
        write(Att_name), nl,
        ents_with_att(Att_name).

ents_with_att(Att_name):-

              % next att of given ent
        ent_att_names(Ent, Att_names),

              % Att member of the multi_name att
        (member(Att_name, Att_names),
        write(Ent), nl)
        |
        fail.
ents_with_att(_Att_name).
```

```
        %       finds all the entity names in the schema
all_schema_ents:-
                % next schema ent
        ent_names_s(Ent_names, _),
        write(['entity   ',Ent_names]), nl,
        fail.


        %       Display the atts of a the given entity name
atts_of_chosen_ent:-
        nl, nl,
        write('-----------------------------------------------------'), nl,
        write('You have requested to list the attributes of a given entity'),
nl,
        write('Please enter the entity name:   '),
        read(Ent),
        atts_of_chosen_ent_1(Ent).


atts_of_chosen_ent_1(Ent):-
        ent_att_names(Ent, Att_names),
        write(Att_names), nl,
        fail.
atts_of_chosen_ent_1(_).


        %       displays all the rels in the schema
all_rels:-
        ent_rel_s(ent1(Ent1, _, _),
                  rel(Rel_names),
          ent2(Ent2, _, _)),

        write(['entity-relationship ', Ent1,'      ',Rel_names, '   ',
                                              Ent2]), nl,
        fail.


        %       lists all the atts in the schema
all_atts:-
        att_names_s(Att_names),
        write(['attribute          ',Att_names]), nl,
        fail.
```

```
/*************************************************************************/
/*      Module : query_views                                             */
/*      Author : Mansoor Hassan                                          */
/*      Notes  : This module retrieves any kind of information           */
/*               about the global schema                                 */
/*               and the individual user views.                          */
/*************************************************************************/


/*
view(V_name, P).
subview(V_name, Subview_name, Sub_view_prio).
att(V_name, [Att_name]).
ent(V_name, ent([Ent_names], Ent_occ, Ent_prio)).
ent_att(V_name,
             ent([Ent_names] , Ent_occ),
             att_det([Att_names], [Vals], K_stat, Att_prio)).
rel(V_name, rel([Rel_names], Rel_occ, Rel_prio)).
rel_att(V_name,
             rel([Rel_names], Rel_occ),
             att_det([Att_names], [Vals], K_stat, Att_prio)).
ent_rel(V_name,
       ent([Ent_names], Ent_occ, [Cards], [Ent_stat]),
             rel_name([Rel_names], Rel_occ),
       ent([Ent_names], Ent_occ, [Cards], [Ent_stat])).
*/


query_views:-
       nl, nl, nl,
       write('You have requested to query the contents of the views.'),nl,
       write('Below is a list of the queries you can make.'), nl,
       write('Type the appropriate number of the query, followed by a .'),
       nl, nl,
       write('1     List view names'),nl,
       write('2     Check if a certain view name exists'),nl,
       write('3     List all the relationship names in a certain view'),nl,
       write('4     List entities of a certain relationship in all views'),nl,
       write('5     List entities of certain relationship in certain view'),nl,
       write('6     Show cardinalities of entities in a relationship'),nl,
       write('7     List the attributes in a given entity'),nl,
       write('8     List entities with a given attribute'),nl,
       write('9     List List all relationship names in all views'),nl,
       write('10    List key attributes of a given entity ina given view'),nl,

       write('n     To end the querying of the views'), nl,
       nl,
       read(Q),
       query_views_1(Q).
query_views.


query_views_1(1):-
       views_names,
       pause,
       query_views.

query_views_1(2):-
       view,
       pause,
       query_views.

query_views_1(3):-
       rels_names_in_view,
       pause,
       query_views.

query_views_1(4):-
       ents_in_rel,
```

```
        pause,
        query_views.

query_views_1(5):-
        ents_in_rel_in_view,
        pause,
        query_views.

query_views_1(6):-
        cardinalities_v,
        pause,
        query_views.

query_views_1(7):-
        atts_of_ent,
        pause,
        query_views.

query_views_1(8):-
        view_ents_with_att,
        pause,
        query_views.

query_views_1(9):-
        list_all_rels,
        pause,
        query_views.

query_views_1(10):-
        key_atts_of_ent_v,
        pause,
        query_views.

query_views_1(n).


query_views_1(_):-
        pause,
        query_views.


%       The following predicates are for querying the contents of the
%       individual user views.

%       Gets all the view names of the application.

views_names:-
        view(V, _), nl,
        write(V),
        fail.
views_names.


%       gets all the view names in the application
%       and also checks if a given view is in the data base

view:-
        nl, nl,
        write('Enter the view name:   '),
        read(V),
        view(V, _),
        write('found view:   '), write(V).
view:-
        write('could not find view requested').



%       Finds the relationships in a given view, or
%       Finds all the relationships of all the views

rels_names_in_view:-
```

```
        nl, nl,
        write('Enter the name of the view you wish to list its relationships'),
        nl,
        read(View),
        rels_names_in_view_1(View).

rels_names_in_view_1(View):-
        rel(View, rel(Rel_names, _, _)), nl,
        write('Relationship      '),
        write(Rel_names), nl,
        fail.
rels_names_in_view(_View).



%       Finds the entities  involved in a relationship in any of the  views.
ents_in_rel:-
        nl, nl,
        write('Enter the name of the relationship you wish'), nl,
        write('to list the entities involved in it'), nl,
        read(Rel),
        ents_in_rel_1(Rel).

ents_in_rel_1(Rel):-
        nl,
        write('The following entities are involved in relationship     '),
        write(Rel), nl,
        ents_in_rel_2(Rel).


ents_in_rel_2(Rel):-
        ent_rel(_,
          ent(Ent1, _, _, _),
                  rel(Rel, _),
          ent(Ent2, _, _, _)),
        write(Ent1),
        write(' and '),
        write(Ent2), nl,
        fail.
ents_in_rel_2(_Rel).


%       Finds the entities  involved in a relationship in a given  views.
ents_in_rel_in_view:-
        nl, nl,
        write('Enter the view name in which relationship is modelled'), nl,
        read(View),
        write('Enter the relationship name you wish to list its entities'), nl,
        read(Rel),
        ents_in_rel_in_view_1(View, Rel).

ents_in_rel_in_view_1(View, Rel):-
        nl,
        write('Entities involved in the relationship     '),
        write(Rel),
        write('  in the view    '),
        write(View), nl,
        fail.

ents_in_rel_in_view_1(View, Rel):-
        ent_rel(View,
          ent(Ent1, _, _, _),
                  rel(Rel, _),
          ent(Ent2, _, _, _)),
        write(Ent1),
        write(' and '),
        write(Ent2), nl,
        fail.
ents_in_rel_in_view(_, _).
```

```
%       Finds the cardinalities of entities in a relationship

cardinalities_v:-
        nl, nl,
        write('Enter the view name in which relationship is modelled'), nl,
        read(View),
        write('Enter the relationship name you wish to list '), nl,
        write('the cardinalities of the entities involved in it'), nl,
        read(Rel),
        cardinalities_v1(View, Rel).

cardinalities_v1(View, Rel):-
        nl, nl,
        write('The cardinalities of the entities in relationship     '),
        write(Rel),
        write('  in the view    '),
        write(View), nl,
        cardinalities_v2(View, Rel).

cardinalities_v2(View, Rel):-
        ent_rel(View,
           ent(Ent1, _, Ent1_cards, _),
                   rel(Rel, _),
           ent(Ent2, _, Ent2_cards, _)),
        write(Ent1),
        write(' '),
        write(Ent1_cards),
        write('   and    '),
        write(Ent2),
        write('    '),
        write(Ent2_cards), nl,
        fail.
cardinalities_v2(_, _).



%       Finds the attribute names of a given entity

atts_of_ent:-
        nl, nl,
        write('Enter the entity name you wish to list its attributes'), nl,
        read(Ent),
        atts_of_ent_1(Ent).
atts_of_ent_1(Ent):-
        nl, nl,
        write('The entity '),
        write(Ent),
        write('  has the following attributes:'),nl,
        atts_of_ent_2(Ent).

atts_of_ent_2(Ent):-
        ent_att(_, ent(Ent, _),
              att_det(Att_names, _, _, _)),
        write(Att_names), nl,
        fail.
atts_of_ent_2(_).



key_atts_of_ent_v:-
        nl, nl,
        write('-------------------------------------------------------'), nl,
        write('You have requested to look at the key attributes of '),
        write('given entity in a given view'), nl, nl,
        write(' Please enter the view name:  '),
        read(V), nl,
        write('Please enter the name of the entity: '),
```

```
        read(Ent),
        key_atts_of_ent_v_1(V, Ent).


key_atts_of_ent_v_1(V, Ent):-
        ent_att(V, ent(Ent, _),
             att_det(Att, _, key, _)),
        nl,
        write(Att),
        fail.
key_atts_of_ent_v_1(_, _).



%       Finds all the entities in all the views with the given attribute
view_ents_with_att:-
        nl, nl, nl,
        write('You have requested to look at the entities of'),
        write('a given attribute'), nl,
        write('Enter the name of attribute:  '),
        read(Att_name),
        view_ents_with_att_1(Att_name).

view_ents_with_att_1(Att_name):-
        nl, nl, nl,
        write(' The entities with the attribute:'),
        write(Att_name),
        write('are:'), nl,
        view_ents_with_att_2(Att_name).

view_ents_with_att_2(Att_name):-
        ent_att(View, ent(Ent, _),
               att_det(Att_name, _, _, _)),
        write(Ent),
        write('          in view  '),
        write(View), nl,
        fail.
view_ents_with_att(_).


%       finds all the entity names in all the views
all_ents:-
        ent(_, ent(Ent, _,_)),
        write(['entity        ',Ent]), nl,
        fail.


list_ents_in_a_rel(Rel_name):-
        rel(Rel_name),!,
        view_rel(_,rel(Ent1,Rel_name,Ent2)),
        write([Ent1,'    and    ',Ent2]),nl,
        fail.

list_atts_of_chosen_ent(Ent):-
        ent_att(Ent,Att),
        write(['Entity   ',Ent, 'has attributes   ',Att]),nl,
        fail.



list_all_rels:-
        nl, nl, nl,
        write('Below are all the relationship names in all views'),
        list_all_rels_1.

list_all_rels_1:-
        rel(View, rel(R, _ ,_)),
        write('relationship:  '),
        write(R),
        write('             in view: '),
```

```
        write(View),  nl,
        fail.

list_rels_of_chosen_view(View):-
        view_rel(View,Relation),
        write(['Relation    ',Relation]),nl,
        fail.

list_all_atts:-
        ent_att(_,A),
        write(['attribute          ',A]),  nl,
        fail.


list_all_generalisations:-
        gen(Gen,_),
        write(['generalisation object    ',Gen]),nl,
        fail.

list_gen_in_a_view(View):-
        gen(View,  Gen_ent,  Gen_category),
        write(['Generalisation entity    ',  Gen_ent]),nl,
        write(['Generalisation category    ',  Gen_category]),nl,nl,
        fail.
```

```
/*      Module          : schema_vdl_form                                   */
/*      Author          : Mansoor Hassan                                    */
/*      Notes  : This module displays the contents of the main schema       */
/*               in a VDL format.                                           */


show_rel :-
    nl, nl,
     write('You have requested to look at all occurences of a relationship'),nl,
     write('Please enter the relationship name you want displayed:'), nl,
     read(Rel),
     show_rel_1([Rel]).


          % This predicate displays one relationship from the schema
show_rel_1(Rel) :-
       ent_rel_s(ent1(E1, E1_cards, E1_stat),
                 rel(Rel),
              ent2(E2, E2_cards, E2_stat)),
       show_ent_rel_det(ent1(E1, E1_cards, E1_stat),
                 rel(Rel),
              ent2(E2, E2_cards, E2_stat)),
       fail.

show_rel_1(_).



show_ent :-
    nl, nl,
     write('You have requested to look at all occurences of a relationships'),
    nl,
     write('which involve a chosen entity given by you'), nl, nl,
     write('Please enter the entity name you want displayed:'), nl,
     read(Ent),
     show_ent_1([Ent]).


          % This predicate displays one relationship from the schema
show_ent_1(Ent) :-
       ent_rel_s(ent1(E1, E1_cards, E1_stat),
                 rel(Rel),
              ent2(E2, E2_cards, E2_stat)),
       show_ent_2(Ent, E1, E1_cards, E1_stat, Rel, E2, E2_cards, E2_stat),
       fail.
show_ent_1(_).



show_ent_2(Ent, E1, E1_cards, E1_stat, Rel, E2, E2_cards, E2_stat) :-
       rel_involves_ent(Ent, Rel),
       ent_of_this_rel(Ent, E1, E2),
       show_ent_rel_det(ent1(E1, E1_cards, E1_stat),
                 rel(Rel),
              ent2(E2, E2_cards, E2_stat)).


ent_of_this_rel(Ent, E1, _) :-
       Ent=E1.

ent_of_this_rel(Ent, _, E2) :-
       Ent=E2.



          % This predicate displays all the relationships in the schema
show_schema:-
       ent_rel_s(ent1(E1, E1_cards, E1_stat),
```

```
                rel(Rel),
              ent2(E2, E2_cards, E2_stat)),

       show_ent_rel_det(ent1(E1, E1_cards, E1_stat),
                rel(Rel),
              ent2(E2, E2_cards, E2_stat)),
       fail.


show_schema.


show_ent_rel_det(ent1(E1, E1_cards, E1_stat), rel(Rel),
                           ent2(E2, E2_cards, E2_stat)) :-
       write_rel_name(Rel),
       write_rel_att_det(Rel),
       write_ent_det(E1, E1_cards, E1_stat),
       show_ent_att_det(E1),


       write_ent_det(E2, E2_cards, E2_stat),
       show_ent_att_det(E2), !.

show_ent_rel_det(_, _, _).



write_rel_att_det(Rel):-
       rel_att_det_s(Rel, att(Att, Vals, K_stat, Prio)),
       write_att_det(Att, Vals, K_stat, Prio),
       fail.
write_rel_att_det(_).



write_ent_det(E, E_cards, E_stat) :-
       nl, nl,
       write('       entity  '),
       write(E),
       write('     cardinality  '),
       write(E_cards),
       write_ent_det_1(E_stat).


write_ent_det_1(E_stat) :-
       \+ E_stat==[],
       write('     role  '),
       write(E_stat).
write_ent_det_1(_).



show_ent_att_det(E) :-
       ent_att_det_s(E, att(Att, Vals, K_stat, Prio)),
       write_att_det(Att, Vals, K_stat, Prio),
       fail.
show_ent_att_det(_).


write_att_det(Att, Vals, K_stat, _) :-
       nl,
       write('              attribute  '),
       write(Att),
       write(',   '),
       write(K_stat),
       write(',   '),
       show_att_vals(Vals).
```

```
write_att_det(_, _, _, _).


show_att_vals(V)  :-
       nonvar(V),
       V\==[],
       write('values   '),
       write(V).
show_att_vals(_).



write_rel_name(Rel):-
       rel_names_s(Rel, _),
       nl, nl, nl, nl, nl,
       write('relationship   '),
       write(Rel).
```

```
/*      Module          : views_vdl_form                                    */
/*      Notes  : This module displays the contents of the views             */
/*               in a VDL format.                                           */


        % displays all the entity-relationships of all the views.
show_all_views:-
        view(V, _), nl, nl, nl,
        write('*****************************************************'),
        write('*****************************************************'), nl, nl,
        write('considering view    '),
        write(V),
        show_view_vdl_form(V),
        fail.
show_all_views.


            % This predicate displays all the relationships in the schema
show_view_vdl_form:-
        ask_for_view_name(V),
        show_view_vdl_form(V).

show_view_vdl_form.



            % Shows the contents of a given view in VDL format
show_view_vdl_form(V)  :-
        ent_rel(V,
                    ent(E1, E1_occ, Cards1, Stat1),
                rel(Rel,  Rel_occ),
                    ent(E2, E2_occ, Cards2, Stat2)),
        show_view_ent_rel_det(V,
                    E1, E1_occ, Cards1, Stat1,
                Rel,  Rel_occ,
                    E2, E2_occ, Cards2, Stat2),
        fail.


show_view_vdl_form(_).

            % This predicate displays one relationship from the schema
show_view_rel  :-
        ask_for_rel_name(V,  Rel),
        show_view_rel_1(V,  Rel).
show_view_rel.



show_view_rel_1(V,  Rel)  :-
        ent_rel(V,
                    ent(E1, E1_occ, Cards1, Stat1),
                rel(Rel,  Rel_occ),
                    ent(E2, E2_occ, Cards2, Stat2)),
        show_view_ent_rel_det(V,
                    E1, E1_occ, Cards1, Stat1,
                Rel,  Rel_occ,
                    E2, E2_occ, Cards2, Stat2),
        fail.

show_view_rel(_).



show_view_ent_rel_det(V,
                      E1, E1_occ, Cards1, Stat1,
                      Rel,  Rel_occ,
                      E2, E2_occ, Cards2, Stat2):-
```

```
        show_view_ent_rel_det_1(V,
                        E1, E1_occ, Cards1, Stat1,
                        Rel, Rel_occ,
                        E2, E2_occ, Cards2, Stat2),
        !.

show_view_ent_rel_det_1(V,
                        E1, E1_occ, Cards1, Stat1,
                        Rel, Rel_occ,
                        E2, E2_occ, Cards2, Stat2) :-

        write_view_rel_name(V, Rel, Rel_occ),
        write_view_rel_att_det(V, Rel, Rel_occ),
        write_view_ent_det(E1, Cards1, Stat1),
        show_view_ent_att_det(V, E1, E1_occ),


        write_view_ent_det(E2, Cards2, Stat2),
        show_view_ent_att_det(V, E2, E2_occ), !.

show_view_ent_rel_det_1(_, _, _, _, _, _, _, _, _, _, _).



write_view_ent_det(E, E_cards, E_stat) :-
        nl, nl,
        write('       entity  '),
        write(E),
        write('     cardinality  '),
        write(E_cards),
        write_view_ent_det_1(E_stat).


write_view_ent_det_1(E_stat):-
        nonvar(E_stat),
        \+ E_stat==[],
        write('     role  '),
        write(E_stat).
write_view_ent_det_1(_).


show_view_ent_att_det(V, E, E_occ) :-
        ent_att(V,
                    ent(E , E_occ),
                     att_det(Att, Vals, K_stat, Prio)),
        write_view_att_det(Att, Vals, K_stat, Prio),
        fail.
show_view_ent_att_det(_, _, _).



write_view_att_det(Att, Vals, K_stat, _) :-
        nl,
        write('                attribute  '),
        write(Att),
        write('  '),
        write(K_stat),
        show_view_att_vals(Vals),
        write(',  ').
write_view_att_det(_, _, _, _).


show_view_att_vals(V) :-
        nonvar(V),
        V\==[],
        write(',  values  '),
        write(V).
show_view_att_vals(_).
```

```
write_view_rel_att_det(V, Rel, Rel_occ):-
      rel_att(V,
                rel(Rel, Rel_occ),
                att_det(Att, Vals, K_stat, _)),

      write_view_att_det(Att, Vals, K_stat, _),
      fail.

write_view_rel_att_det(_, _, _).


write_view_rel_name(_V, Rel, _Rel_occ):-
      nl, nl, nl,
      write('relationship   '),
      write(Rel),
      nl.
write_view_rel_name(_, _, _).


ask_for_view_name(V) :-
      nl, nl, nl,
      write('You have requested to look at the contents of a view '), nl,
      write('in VDL format, '), nl, nl,
      write('Please enter the name of the view     :  '),
      read(V).

ask_for_view_name(_).


ask_for_rel_name(V, R) :-
      nl, nl, nl,
      write('You have requested to look at the contents of a rel '), nl,
      write('in VDL format, '), nl, nl,
      write('Please enter the name of the rel      :  '),
      read(R), nl, nl,
      write('Enter the name of the view where the  is '), nl,
      write('Please enter the name of the view     :  '),
      read(V).

ask_for_rel_name(_, _).
```

```
/*                                                                    */
/*     Module : add_ent_att_det_to_schema                             */
/*     Author : Mansoor Hassan                                        */
/*     Notes  : This module handles the attribute details of a given entity */
/*              It compares the view entity attribute details with those  */
/*              of the schema entity attributes (if any), and update the  */
/*              latter in the appropriate way                             */



        % holds the temporary decided rel att key status
:- dynamic  real_ent_att_key_stat/1.

        % holds the temporary decided rel att value
:- dynamic  real_ent_att_val/1.



      % Adds the details of the attributes of the given entity to the main
      % schema if not already considered

assert_ent_att_det(V_name, _Rel_names, _Rel_occ, Ent_names , Ent_occ) :-

            % find next attribute details
      ent_att(V_name,
            ent(Ent_names , Ent_occ),
            att_det(Att_names, _Vals, _K_stat, _Att_prio)),


            % add next ent attribute name  and the the att details
            % to the schema, if not already in the schema.
            % The entity and its attribute details might have been
            % added from the consideration of another rel which links
            % this entity
      assert_fact(ent_att_names(Ent_names, Att_names)),
      assert_corr_ent_atts(V_name, Ent_names, Ent_occ),

            % add the attribute name without being linked to a rel or ent,
            % if not already in the schema

      assert_fact(att_names_s(Att_names)),

      fail.

assert_ent_att_det(_, _, _, _, _).



assert_ent_atts(V_name, rel(Rel_names, Rel_occ, _),
            ent_rel_s(ent1(Ent1_names_s, Ent1_cards_s, Ent1_stat_s),
            rel(Rel_names_s),
                  ent2(Ent2_names, Ent2_cards_s, Ent2_stat_s))) :-

            % to identify the corresponding entity names of the
            % two relationships in order to assert the view rel ent atts
            % to the schema rel ent atts, if not already part of
            % the entities
      identify_correspond_rel_ents(V_name, rel(Rel_names, Rel_occ, _),
            ent_rel_s(ent1(Ent1_names_s, Ent1_cards_s, Ent1_stat_s),
                  rel(Rel_names_s),
                  ent2(Ent2_names, Ent2_cards_s, Ent2_stat_s))), !.



      %     assert the atts of the view rel ent in the corresponding
      %     schema rel ent, if not already asserted.
```

```
assert_corr_ent_atts(V_name, Ent_names, Ent_occ) :-

        % extract next view rel ent att details
    ent_att(V_name,
        ent(Ent_names , Ent_occ),
        att_det(Att_names, Vals, K_stat, Att_prio)),

        % assert view rel ent att for corres schema rel ent
    assert_corr_schema_ent_atts(V_name, Ent_names, Ent_occ,
                    Att_names, Vals, K_stat, Att_prio),
    fail.
assert_corr_ent_atts(_, _, _).



    % This predicate is called by the predicate assert_corr_ent_atts.
    % It checks if the schema ent_att connection exists.
    % If it does, then it calls the relevant preds to update the
    % details of the schema ent attribute.

assert_corr_schema_ent_atts(V_name, Ent_names, Ent_occ,
                            Att_names, Vals, K_stat, Att_prio) :-

    assert_corr_ent_atts_det(V_name, Ent_names, Ent_occ,
                    Att_names, Vals, K_stat, Att_prio), !.

assert_corr_schema_ent_atts(_, _, _, _, _, _, _).



assert_corr_ent_atts_det(V_name, Ent_names, Ent_occ,
                    Att_names, Vals, K_stat, Att_prio) :-

            % check if schema ent att exists
    ent_att_names(Ent_names, Att_names),

    update_ent_att_det(V_name, Ent_names, Ent_occ, _Ent_s,
                    Att_names, Vals, K_stat, Att_prio).



assert_corr_ent_atts_det(_V_name, Ent_names, _Ent_occ,
                    Att_names, Vals, K_stat, Att_prio) :-

        % view rel ent att is not asserted in the schema rel ent,
        % therefore, assert missing the schema ent att det connection.

            % assert view rel ent att for corres schema rel ent
    assert(ent_att_names(Ent_names, Att_names)),

    assert(ent_att_det_s(Ent_names,
            att(Att_names, Vals, K_stat, Att_prio))).




        % view rel ent att is asserted to schema rel ent,
        % therefore, assert missing or diff schema att det
update_ent_att_det(V_name, Ent_names, Ent_occ, _Ent_s,
                    Att_names, Val, K_stat, _Att_prio) :-

            % extract schema ent att det
    ent_att_det_s(Ent_names,
        att(Att_names, Val_s, K_stat_s, Att_prio_s)),

            % update the schema ent att key status
    update_ent_att_key_stat(V_name, Ent_names, Ent_occ, _Ent_s,
```

```
                    Att_names, K_stat, K_stat_s, _Real_k_stat),

                    % update the schema ent att value
update_ent_att_val(V_name, Ent_names, Ent_occ, _Ent_s,
                    Att_names, Val, Val_s, _Real_val),

        % extract the decided ent att key stat
real_ent_att_key_stat(Decided_k_stat),


        % extract the decided ent att value
real_ent_att_val(Decided_val),

retract(ent_att_det_s(Ent_names,
        att(Att_names, _, _, _))),


        % assert the schema ent att connection with the decided
        % attribute details
assert_fact(ent_att_det_s(Ent_names,
        att(Att_names, Decided_val, Decided_k_stat, Att_prio_s))),

retract(real_ent_att_key_stat(Decided_k_stat)),
retract(real_ent_att_val(Decided_val)).
```

```
/*     Module : add_rel_att_det_to_schema                                  */
/*     Author : Mansoor Hassan                                             */
/*     Notes  : this predicate updates the att details of the schema rel   */
/*              with those of the view rel.                                */
/*              in case of conflict, the history is referenced, and if not*/
/*              available, then the DBA is asked for help.                 */
/**************  Althoug, all rel atts are transferred by VI to their     */
/*              connecting ents, this is carried out as a post integration */
/*              (restructuring) step. Now, the updating is done first      */


      % holds the temporary decided rel att key status
:- dynamic  real_rel_att_key_stat/1.

      % holds the temporary decided rel att value
:- dynamic  real_rel_att_val/1.



      % extreacts all the attributes names and details for the current rel
      % in order to add them to the main schema
add_rel_att_det_to_schema(V_name,  Rel_names,  Rel_occ):-

            % find next attribute details
      rel_att(V_name,
            rel(Rel_names,  Rel_occ),
            att_det(Att_names,  Vals,  K_stat,  Att_prio)),

            % add next rel att name  and the the att details to the schema,
            % if not already asserted
      add_rel_att_names(V_name,  Rel_names,  Rel_occ,  Att_names),

            % since rel is being added to the schema for the firsty time
            % all its atts details are also new, hence direct assert
      add_rel_att(V_name,  Rel_names,  Rel_occ,
            att(Att_names,  Vals,  K_stat,  Att_prio)),

      fail.

add_rel_att_det_to_schema(_,  _,  _).



add_rel_att(V_name,  Rel_names,  Rel_occ,
                        att(Att_names,  Vals,  K_stat,  Att_prio)) :-

      add_rel_att_det(V_name,  Rel_names,  Rel_occ,
                  att(Att_names,  Vals,  K_stat,  Att_prio)), !.

add_rel_att(_,  _,  _,  _).



add_rel_att_det(V_name,  Rel_names,  Rel_occ,
                  att(Att_names,  Vals,  K_stat,  Att_prio)) :-

                  % extract full details of rel att
      rel_att_det_s(Rel_names,
                  att_det(Att_names,  Vals_s,  K_stat_s,  Att_prio_s)),

                  % update other details of att
      update_rel_att_det(V_name,  Rel_names,  Rel_occ,  Att_names,
            Vals,  K_stat,  Att_prio,
            Vals_s,  K_stat_s,  Att_prio_s).
```

```
            % rel att does not exist in schema,
            % so assert schema rel att from view rel att
add_rel_att_det(_, Rel_names, _,
                att(Att_names, Vals, K_stat, Att_prio)) :-

      assert_fact(rel_att_det_s(Rel_names,
            att(Att_names, Vals, K_stat, Att_prio))).



add_rel_att_names(_V_name, Rel_names, _Rel_occ, Att_names):-
      add_rel_att_names_to_schema(_V_name, Rel_names, _Rel_occ, Att_names),
      !.

add_rel_att_names(_, _, _, _).



            % assert the rel_att names conncection to the schema
            % if it does not exist
add_rel_att_names_to_schema(_V_name, Rel_names, _Rel_occ, Att_names):-

            % schema rel att connection already exists
      rel_att_names_s(Rel_names, Att_names).




            % assert the rel_att names conncection to the schema
add_rel_att_names_to_schema(_V_name, Rel_names, _Rel_occ, Att_names):-

            % rel att names connection does not exist, so assert this fact
      assert_fact(rel_att_names_s(Rel_names, Att_names)).



      % Update the schema rel att det from the view rel att det.
      % or from the history, or from the DBA
update_rel_att_det(V_name, Rel_names, Rel_occ, Att_names,
            Vals, K_stat, _Att_prio,
            Vals_s, K_stat_s, _Att_prio_s) :-

                  % decide real att key status
      update_rel_att_k_stat(V_name, Rel_names, Rel_occ, Att_names,
            K_stat, K_stat_s, _Real_k_stat),

                  % decide rel key status
      update_rel_att_val(V_name, Rel_names, Rel_occ, Att_names,
            Vals, Vals_s, _Real_val),


%           % decide rela att prio
%     update_rel_att_val(V_name, Rel_names, Rel_occ, Att_names,
%           Att_prio, Att_prio_s, Real_att_prio),


            % extract decided rel att key stat
      real_rel_att_key_stat(Real_k_stat),

            % extract decided rel att val
      real_rel_att_val(Real_vals),
                  % assert schema rel att det with real details
      assert_fact(rel_att_det_s(Rel_names,
            att(Att_names, Real_vals, Real_k_stat, _Real_att_prio))),!.
```

```
        % If view rel has attributes, then
        % if the att of view rel is not already part of the schema rel, then
        % assert this fact in the database by attaching the att to the
        % schema rel.
assert_rel_atts(V_name, rel(Rel_names, Rel_occ, _),
                    ent_rel_s(ent1(Ent_names, Cards, Stat),
                          rel(_Rel_names_s),
                                ent2(Ent_names, Cards, Stat))) :-

              %       check if view rel has attributes
        true_fact(rel_att(V_name,
              rel(Rel_names, Rel_occ),
              att_det(Att_names, Vals, K_stat, Att_prio))),

              %       add the rel_att names connection to the knowledge base
        assert_fact(rel_att_names_s(Rel_names, Att_names)),

              %       add the rel_att_det to the main schema knowledge base
        assert_fact(rel_att_det_s(Rel_names,
              att(Att_names, Vals, K_stat, Att_prio))),

        fail.


assert_rel_atts(_, _, _).
```

```
/*      Module : add_and_update_ent_names                                    */
/*      Author : Mansoor Hassan                                              */
/*      Notes  : This module adds the ent name and its priority to the schem */
/*               if not already aserted.                                     */
/*               If the connection is already declared then this module uses */
/*               the update_ent_name_prio to assert the new prio value       */
/*               from the history or from the DBA, if no hsitory             */
/*               of this is kept                                             */


            % ent prio connection already exists, so update prio value
add_and_update_ent_names(_, Ent_names, _, _) :-
        ent_names_s(Ent_names, _).


            % ent prio connection is asserted for the first time
add_and_update_ent_names(_, Ent_names, _, Ent_prio) :-
        assert_fact(ent_names_s(Ent_names, Ent_prio)).



            % use view ent prio as schema ent prio
update_ent_prio(_, Ent_names, _, Ent_prio, Ent_prio_s) :-
        var(Ent_prio_s),
            % remove old ent prio connection before inserting new one
        replace_fact(ent_names_s(Ent_names, Ent_prio_s),
            ent_names_s(Ent_names, Ent_prio)).


            % ent prio is 0 so dont change connection
update_ent_prio(_, _, _, Ent_prio, _) :-
        var(Ent_prio).


            % both prios  equal, then schema ent prio is already asserted
update_ent_prio(_, _, _, Ent_prio, Ent_prio_s) :-
        nonvar(Ent_prio),
        nonvar(Ent_prio_s),
        Ent_prio==Ent_prio_s.


            % both prios not zero, not equal, but in history
update_ent_prio(_, Ent_names, _, _, Ent_prio_s) :-
            % DBA has solved a previous ent prio conflict,
            % and it is different to the schema ent prio,
            % so remove old connection and create new one
        hist_ent_prio(ent_names_s(Ent_names, Hist_ent_prio)),
        replace_fact(ent_names_s(Ent_names, Ent_prio_s),
            ent_names_s(Ent_names, Hist_ent_prio)).


update_ent_prio(V_name, Ent_names, Ent_occ, Ent_prio, Ent_prio_s) :-
        ask_DBA_for_ent_prio(V_name,
                    Ent_names, Ent_occ, Ent_prio, Ent_prio_s, Reply),
        ent_prio_confl_DBA_reply(V_name,
                    Ent_names, Ent_occ, Ent_prio, Ent_prio_s, Reply).

update_ent_prio(_, _, _, _, _).


ask_DBA_for_ent_prio(V_name,
                    Ent_names, _Ent_occ, Ent_prio, Ent_prio_s, Reply):-

        % none of the above is satisfied, so ask the DBA to resolve conflict
        clear_screen, nl,
```

```
        write('CONFLICT between view and schema entities priorities'), nl, nl,
        write('view name is :   '),
        write(V_name), nl, nl,
        write('entity name is :   '),
        write(Ent_names), nl, nl,
        write('schema entity has priority :   '),
        write(Ent_prio_s), nl, nl,
        write('view entity has priority :   '),
        write(Ent_prio), nl, nl,
        write('Please do one of the following :'), nl, nl,
        write('     1.  Enter a new priority value'), nl,
        write('     2.  Type q or query to get information from the views or'),
        nl,
        write('          schema'), nl,
        read(Reply).


        % DBA has given new prio value or requested information about
        % the views or schema to help him decide.
ent_prio_confl_DBA_reply(V_name,
                        Ent_names, Ent_occ, Ent_prio, Ent_prio_s, Reply) :-
        (Reply==q;
        Reply==query),
        query,
        ask_DBA_for_ent_prio(V_name,
                        Ent_names, Ent_occ, Ent_prio, Ent_prio_s, Reply).


        % DBA has given a prio val, therefore,
        % replace old ent prio connection and assert as history
ent_prio_confl_DBA_reply(_, Ent_names, _Ent_occ, _Ent_prio,
                                        Ent_prio_s, New_prio) :-

                % replace old ent prio in the schema by the DBA given ent prio
        replace_fact(ent_names_s(Ent_names, Ent_prio_s),
                ent_names_s(Ent_names, New_prio)),

                % a new ent prio by the DBA is asserted as history
                % for future conflicts.
        assert(hist_ent_prio(ent_names_s(Ent_names, New_prio))).
```

```
/*      Module : add_and_update_rel_names                                    */
/*      Author : Mansoor Hassan                                              */
/*      Notes  : This module adds the rel name and its priority to the schem */
/*               if not already aserted.                                     */
/*               If the connection is already declared then this module uses */
/*               the update_rel_prio to assert the new prio value either     */
/*               from the history or from the dba                            */


            % rel prio connection already exists, so update prio value
add_and_update_rel_names(_, Rel_names, _, _):-
      rel_names_s(Rel_names, _).


            % rel prio connection is asserted for the first time
add_and_update_rel_names(_, Rel_names, _, Rel_prio):-
      assert_fact(rel_names_s(Rel_names, Rel_prio)).


            % use view rel prio as schema rel prio
update_rel_prio(_V_name, Rel_names, _Rel_occ, Rel_prio, Rel_prio_s):-
      var(Rel_prio_s),
            % remove old rel prio connection before inserting new one
      replace_fact(rel_names_s(Rel_names, Rel_prio_s),
            rel_names_s(Rel_names, Rel_prio)).


            % rel prio is 0 so dont change connection
update_rel_prio(_V_name, _Rel_names, _Rel_occ, Rel_prio, _Rel_prio_s):-
      var(Rel_prio).


            % both prios are equal, then schema rel prio is already asserted
update_rel_prio(_V_name, _Rel_names, _Rel_occ, Rel_prio, Rel_prio_s):-
      nonvar(Rel_prio),
      nonvar(Rel_prio_s),
      Rel_prio==Rel_prio_s.


            % both prios not zero, not equal, but in history
update_rel_prio(_V-name, Rel_names, _Rel_occ, _Rel_prio, Rel_prio_s):-
            % DBA has solved a previous rel prio conflict,
            % and it is different to the schema rel prio,
            % so remove old connection and create new one
      hist_rel_prio(rel_names_s(Rel_names, Hist_rel_prio)),
      replace_fact(rel_names_s(Rel_names, Rel_prio_s),
            rel_names_s(Rel_names, Hist_rel_prio)).


update_rel_prio(V_name, Rel_names, Rel_occ, Rel_prio, Rel_prio_s):-
      ask_DBA_for_rel_prio(V_name,
            Rel_names, Rel_occ, Rel_prio, Rel_prio_s, Reply),

      rel_prio_confl_DBA_reply(V_name, Rel_names, Rel_occ,
                        Rel_prio, Rel_prio_s, Reply).



      % none of the above is satisfied, so ask the DBA to resolve conflict
ask_DBA_for_rel_prio(V_name,
                  Rel_names, _Rel_occ, Rel_prio, Rel_prio_s, Reply):-
      clear_screen,
      write('conflict between view and schema relationship priorities'), nl,
      write('view name is :  '),
      write(V_name), nl, nl,
```

```
        write('relationship name is :   '),
        write(Rel_names), nl, nl,
        write('schema relationship has priority :   '),
        write(Rel_prio_s), nl, nl,
        write('view relationship has priority :   '),
        write(Rel_prio), nl, nl,
        write('Please do on of the following :'), nl, nl,
        write('     1.       Enter a new priority value'), nl,
        write('     2.    Type q or query to get information from the views or'),
        nl,
        write('           schema'), nl,
        read(Reply).


        % DBA has given new prio value or requested information about
        % the views or schema to help him decide.
rel_prio_confl_DBA_reply(V_name, Rel_names, Rel_occ,
                         Rel_prio, Rel_prio_s, Reply) :-
        (Reply==q;
        Reply==query),
        query,
        ask_DBA_for_rel_prio(V_name,
              Rel_names, Rel_occ, Rel_prio, Rel_prio_s, Reply).


rel_prio_confl_DBA_reply(_V_name, Rel_names, _Rel_occ,
                         _Rel_prio, Rel_prio_s, New_prio) :-

              % replace old rel prio in the schema by the DBA given rel prio
        replace_fact(rel_names_s(Rel_names, Rel_prio_s),
              rel_names_s(Rel_names, New_prio)),

              % a new rel prio by the DBA is asserted as history
              % for future conflicts.
        assert(hist_rel_prio(rel_names_s(Rel_names, New_prio))).
```

```
/*                                                                    */
/*     Module  : replace_rel_name                                     */
/*     Author  : Mansoor Hassan                                       */
/*     Notes   : This module has the function of changing the names   */
/*               of any of the ERM relationships, by changing all its */
/*               occurences in the schema.                            */


              % This predicate is called by the designer to replace an old
              % relationship name with a new one
change_rel_name :-
       nl, nl, nl,
       write('Please enter the name of the relationship you wish to change'),
       nl,
       write('followed by the new name you wish the relationship to assume'),
       nl,
       write('Enter old relationship name :  '),
       read(R),
       write('Enter the new relationship name to replace the old name:  '),
       read(New_rel_name),
       replace_rel_name(R, New_rel_name).



              % Replace the name of any relationship from its old name R
              % to a new name as given by the designer in the variable
              % New_rel_name
replace_rel_name(R, New_rel_name) :-
     replace_rel_prio_conn(R, New_rel_name),
     replace_rel_att_connections(R, New_rel_name),
     replace_rel_att_det_connections(R, New_rel_name),
     replace_ent_rel_connections(R, New_rel_name),

    write(['All the occurances of the relationship name  ', R]), nl,
    write(['were replaced by the new relationship name   ', New_rel_name]), nl.



      % Only one occurence should occur of rel priority connection
replace_rel_prio_conn(R, New_rel_name) :-
     retract(rel_names_s(R, P)),
     assertz(rel_names_s(New_rel_name, P)).


replace_rel_prio_conn(_, _).




replace_rel_att_connections(R, New_rel_name) :-
     rel_att_names_s(R, Rel_att),
     replace_att_names_connections_1(R, Rel_att, New_rel_name),
    fail.

replace_rel_att_connections(R, New_rel_name) :-
    nl, nl,
     write(['I Have replaced all the relationship attribute connections']), nl,
     write([' of the relationship  ', R, '  to the new relationship  ']),
     write(New_rel_name), nl.


replace_att_names_connections_1(R, Rel_att, New_rel_name) :-
     retract(rel_att_names_s(R, Rel_att)),
     assertz(rel_att_names_s(New_rel_name, Rel_att)), !.


replace_rel_att_det_connections(R, New_rel_name) :-
```

```
     rel_att_det_s(R, att(N, V, K, P)),
      replace_rel_att_det_connections_1(R, New_rel_name, N, V, K, P),
     fail.
replace_rel_att_det_connections(_, _) :-
     write([' I have replaced all the relationship attribute details ']),
     write(['connections']).


replace_rel_att_det_connections_1(R, New_rel_name, N, V, K, P) :-
     retract(rel_att_det_s(R, att(N, V, K, P))),
     assertz(rel_att_det_s(New_rel_name, att(N, V, K, P))), !.


replace_ent_rel_connections(R, New_rel_name) :-
     ent_rel_s(ent1(_, _, _),
                rel(R),
        ent2(_, _, _)),
      replace_ent_rel_connections_1(R, New_rel_name),
     fail.
replace_ent_rel_connections(_, _).


replace_ent_rel_connections_1(R, New_rel_name) :-
     retract(ent_rel_s(ent1(E1, Cards1, Stat1),
       rel(R),
          ent2(E2, Cards2, Stat2))),
     assertz(ent_rel_s(ent1(E1, Cards1, Stat1),
       rel(New_rel_name),
          ent2(E2, Cards2, Stat2))), !.
```

```
/*                                                                    */
/*     Module  : replace_ent_name                                     */
/*     Author  : Mansoor Hassan                                       */
/*     Notes   : This module has the function of changing the names   */
/*                    of any of the entities , by changing all its    */
/*                    occurences in the schema.                       */



            % This predicate is called by the designer to replace an old
            % entity name with a new one
change_ent_name :-
      nl, nl, nl,
      write('Please enter the name of the entity you wish to change'), nl,
      write('followed by the new name you wish the entity to assume'), nl,
      write('Enter old entity name :  '),
      read(Old_ent_name),
      write('Enter the new entity name to replace the old name:  '),
      read(New_ent_name),
      replace_ent_name(Old_ent_name, New_ent_name).




          % This predicate is called from within VIM to change all
          % the occurences of a given entity name in the schema
replace_ent_name(Old_ent, New_ent) :-
      replace_ent_prio(Old_ent, New_ent),
      replace_ent_att_conn(Old_ent, New_ent),
      replace_ent_att_det_conn(Old_ent, New_ent),
      replace_ent_rel_conn(Old_ent, New_ent),
      nl, nl, nl,
      write(['All the occurences of the entity:  ', Old_ent]), nl,
      write(['have been changed to the new entity name:  ', New_ent]),
      nl, nl.



          % Change all the occurences of the entity name
          %  and priority connections
replace_ent_prio(Old_ent, New_ent) :-
      ent_names_s(Old_ent, Prio),
      replace_ent_prio_1(Old_ent, New_ent, Prio),
      fail.

replace_ent_prio(_, _).


replace_ent_prio_1(Old_ent, New_ent, Prio) :-
      retract(ent_names_s(Old_ent, Prio)),
      assertz(ent_names_s(New_ent, Prio)), !.



          % Change the name of an entity to a new name
          % at all the entity attribute connections
replace_ent_att_conn(Old_ent, New_ent) :-
      ent_att_names(Old_ent, Att),
      replace_ent_att_conn_1(Old_ent, New_ent, Att),
      fail.

replace_ent_att_conn(_, _).



replace_ent_att_conn_1(Old_ent, New_ent, Att) :-
      retract(ent_att_names(Old_ent, Att)),
```

```
        assertz(ent_att_names(New_ent, Att)), !.



            % Change the name of the entity to the new name
            % at all the entity attribute details connections
replace_ent_att_det_conn(Old_ent, New_ent) :-
        ent_att_det_s(Old_ent, att(Att, Vals, K, P)),
        replace_ent_att_det_conn_1(Old_ent, New_ent, Att, Vals, K, P),
        fail.

replace_ent_att_det_conn(_, _).


replace_ent_att_det_conn_1(Old_ent, New_ent, Att, Vals, K, P) :-
        retract(ent_att_det_s(Old_ent, att(Att, Vals, K, P))),
        assertz(ent_att_det_s(New_ent, att(Att, Vals, K, P))), !.


            %Change the name of the entity to the new name
            % at all the entity relationship  connections
replace_ent_rel_conn(Old_ent, New_ent) :-
            % get the next entity relationship connection
        ent_rel_s(ent1(E1, C1, S1),
                  rel(Rel),
          ent2(E2, C2, S2)),

        replace_ent_rel_conn_1(Old_ent, New_ent, E1, C1, S1, Rel, E2, C2, S2),
        fail.

replace_ent_rel_conn(_, _).



replace_ent_rel_conn_1(Old_ent, New_ent, E1, C1, S1, Rel, E2, C2, S2) :-
        replace_ent_rel_conn_2(Old_ent, New_ent, E1, C1, S1, Rel, E2, C2, S2),
        !.



            % Recursive relationship, therefore change both entities
replace_ent_rel_conn_2(Old_ent, New_ent, E1, C1, S1, Rel, E2, C2, S2) :-
        Old_ent=E1,
        Old_ent=E2,
        retract(ent_rel_s(ent1(E1, C1, S1),
                  rel(Rel),
                ent2(E2, C2, S2))),
        assertz(ent_rel_s(ent1(New_ent, C1, S1),
                  rel(Rel),
                ent2(New_ent, C2, S2))).


            % Not recursive relationship, therefore,
            % Change only the name of the left side entity (E1)
replace_ent_rel_conn_2(Old_ent, New_ent, E1, C1, S1, Rel, E2, C2, S2) :-
        Old_ent=E1,
        retract(ent_rel_s(ent1(E1, C1, S1),
                  rel(Rel),
                ent2(E2, C2, S2))),
        assertz(ent_rel_s(ent1(New_ent, C1, S1),
                  rel(Rel),
                ent2(E2, C2, S2))).


            % Not recursive relationship, therefore,
            % Change only the name of the left side entity (E1)
replace_ent_rel_conn_2(Old_ent, New_ent, E1, C1, S1, Rel, E2, C2, S2) :-
```

```
Old_ent=E1,
retract(ent_rel_s(ent1(E1, C1, S1),
          rel(Rel),
       ent2(E2, C2, S2))),
assertz(ent_rel_s(ent1(E1, C1, S1),
          rel(Rel),
       ent2(New_ent, C2, S2))).
```

```
/*                                                                    */
/*     Module  : replace_att_name                                     */
/*     Author  : Mansoor Hassan                                       */
/*     Notes   : This module has the function of changing the names   */
/*                    of any of the attributes , by changing all its  */
/*                    occurences in the schema.                       */


            % This predicate is called by the designer to replace an old
            % attribute name with a new one for a given entity
change_att_name_of_ent(E) :-
      nl, nl, nl,
      write('Please enter the name of the attribute you wish to change'), nl,
      write('followed by the new name you wish the attribute to assume'), nl,
      write('Enter old attribute name :  '),
      read(Old_att),
      write('Enter the new attribute name to replace the old name:  '),
      read(New_att),
      replace_att_name_of_ent(E, Old_att, New_att),
      replace_att_name_of_ent_att(E, Old_att, New_att).


          % This predicate can be called directly by VIM to change the name
          % of a given attribute for a known entity.
          % This predicate assumes both the old and new names of the
          % attribute are given
replace_att_name_of_ent(E, Old_att, New_att) :-
      ent_att_names(E, Old_att),
      replace_att_name_of_ent_1(E, Old_att, New_att),
      fail.

replace_att_name_of_ent(_, _, _).


replace_att_name_of_ent_1(E, Old_att, New_att) :-
      retract(ent_att_names(E, Old_att)),
      assertz(ent_att_names(E, New_att)), !.


          % Change the name of the attribute to the new name
          % at all the entity attribute details connections
replace_att_name_of_ent_att(E, Old_att, New_att) :-
      ent_att_det_s(E, att(Old_att, Vals, K, P)),
      replace_att_name_of_ent_att_1(E, Old_att, New_att, Vals, K, P),
      fail.

replace_att_name_of_ent_att(_, _, _).


replace_att_name_of_ent_att_1(E, Old_att, New_att, Vals, K, P) :-
      retract(ent_att_det_s(E, att(Old_att, Vals, K, P))),
      assertz(ent_att_det_s(E, att(New_att, Vals, K, P))), !.
```

```
/*                                                                    */
/*     Module  : add_sch_ent_att_val                                  */
/*     Author  : Mansoor Hassan                                       */
/*     Notes   : This module has the function of adding a value to an */
/*               attribute of a given entity in the schema            */


            % This predicate is called by the designer to replace an old
            % attribute name with a new one for a given entity
add_sch_ent_att_val :-
      nl, nl, nl,
      write('Please enter the name of the ENTITY of the attribute'), nl,
      write('to which a value is to be added'), nl,
      read(E), nl, nl,
      write('Please enter the name of the ATTRIBUTE you wish to add a'), nl,
      write('value to'), nl,
      write('Enter attribute name :   '),
      read(Att),
      write('Enter the VALUE you wish to add:   '),
      read(V),
      ent_att_det_s(E, att(Att, Vals, K, P)),
      append(V, Vals, New_vals),
      assertz(ent_att_det_s(E, att(Att, New_vals, K, P))).
```

```
/*      Module:         delete_att                                      */
/*                      Deletes an attribute from a given entity        */


delete_att_of_ent(E, A) :-
        retract(ent_att_names(E, A)),
        retract(ent_att_det_s(E, att(A, _, _, _))),
        att_in_other_ent(E, A).
delete_att_of_ent(_, _).

att_in_other_ent(E, A) :-
        ent_att_names(E1, A),
        \+ E=E1.

att_in_other_ent(E, A) :-
        ent_att_names(E1, A),
        E=E1,
        retract(att_names_s(A)).

att_in_other_ent(_, _).
```

```
%       Module          : multi_name_matcher
%       Notes  : This module receives two different lists of objects names
%                and matches them. These objects can be attributes, entities,
%                or relationships.




%       The two names lists match if they are both lists and either
%       they are identical in contents or have at least on  common name.

multi_name_match(Name_list_1,  Name_list_2):-
        is_list(Name_list_1),
        is_list(Name_list_2),
        (Name_list_1 == Name_list_2
        ;
        share_some_names(Name_list_1,  Name_list_2)).



%       This predicate is true if the two name sets share at least
%       one name.

share_some_names(Name_list_1,  Name_list_2):-
        remove_dups(Name_list_1,  Name_set_1),
        remove_dups(Name_list_2,  Name_set_2),
        intersect_name_sets(Name_set_1,  Name_set_2).



%    intersect(Set1, Set2)
%    is true when the two sets have a member in common.  It assumes
%    that both sets are known, and that you don't care which element
%    it is that they share.

intersect_name_sets(Name_list_1,  Name_list_2)  :-
          member(Element,  Name_list_1),
          memberchk(Element,  Name_list_2),
         !.
```

```
/*      Module          : schema_stats                                  */
/*      Notes  : This module shows the statistics of the views.         */


:- dynamic written/1.

s_no_of_rels:-
        nl, nl,
        write('The following are the relationships in all the schema'), nl, nl,
        assert(t(0)),
        s_no_of_rels_1,
        retract(t(T)), nl, nl, nl,
        write('Totoal number of relationships in all the schema is: '),
        write(T), nl.

s_no_of_rels.


s_no_of_rels_1:-
        rel_names_s(Rel, _), nl,
        write('relationship:    '),
        write(Rel),
        add_one,
        fail.

s_no_of_rels_1.



s_no_of_ents:-
        nl, nl,
        write('The following are the entities in all the schema'), nl, nl,
        assert(t(0)),
        s_no_of_ents_1,
        retract(t(T)), nl, nl, nl,
        write('Totoal number of entities in all the schema is: '),
        write(T), nl.

s_no_of_ents.


s_no_of_ents_1:-
        ent_names_s(Ent, _), nl,
        write('entity:    '),
        write(Ent),
        add_one,
        fail.

s_no_of_ents_1.



s_no_of_atts:-
        nl, nl,
        write('The following are the attributes in all the schema'), nl, nl,
        assert(t(0)),
        s_no_of_atts_1,
        retract(t(T)), nl, nl, nl,
        write('Totoal number of attributes in all the schema is: '),
        write(T), nl.

s_no_of_atts.


s_no_of_atts_1:-
        att_names_s(Att),
        s_no_of_atts_2(Att),
        fail.
```

```
s_no_of_atts_1.


s_no_of_atts_2(Att):-
        written(Att), !.


s_no_of_atts_2(Att):-
        write('Attribute:    '),
        write(Att),
        add_one, !.
```

```
/*      Module          : views_stats                                   */
/*      Notes  : This module shows the statistics of the views.         */


:- dynamic t/1.


add_one:-
        retract(t(S)),
        T is S +1,
        assert(t(T)), !.


no_of_views:-
        nl, nl,
        write('The following are the views considered for integration'), nl,
        nl,
        assert(t(0)),
        no_of_view_1.


no_of_view_1:-
        view(V, _),
        write(V),
        add_one,
        nl,
        fail.

no_of_view_1:-
        retract(t(T)), nl,
        write('Totoal number of views is: '),
        write(T),
        assert(total_no_of_views(T)).



no_of_rels:-
        nl, nl,
        write('The following are the relationships in all the views'), nl, nl,
        assert(t(0)),
        no_of_rels_1.


no_of_rels_1:-
        view(V, _), nl, nl, nl,
        write('view: '),
        write(V), nl,
        no_of_rels_2(V),
        fail.

no_of_rels_1:-
        retract(t(T)), nl, nl, nl,
        write('Totoal number of relationships in all the views is: '),
        write(T), nl,
        total_no_of_views(N),
        Average is T / N,
        write('Average number of relationships in each view is: '),
        write(Average).
no_of_rels_1.

no_of_rels_2(V):-
        no_of_rels_3(V), !.


no_of_rels_3(V):-
        rel(V, rel(Rel, _, _)), nl,
        write('relationship:    '),
        write(Rel),
        add_one,
        fail.
```

```
no_of_rels_3(_).


no_of_ents:-
       nl, nl,
       write('The following are the entities in all the views'), nl, nl,
       assert(t(0)),
       no_of_ents_1.


no_of_ents_1:-
       view(V, _), nl, nl, nl,
       write('view: '),
       write(V), nl,
       no_of_ents_2(V),
       fail.

no_of_ents_1:-
       retract(t(T)), nl, nl, nl,
       write('Totoal number of entities in all the views is: '),
       write(T), nl,
       total_no_of_views(N),
       Average is T / N,
       write('Average number of entities in each view is: '),
       write(Average).
no_of_ents_1.

no_of_ents_2(V):-
       no_of_ents_3(V), !.


no_of_ents_3(V):-
       ent(V, ent(Ent, _, _)), nl,
       write('Entity:    '),
       write(Ent),
       add_one,
       fail.

no_of_ents_3(_).



no_of_ent_atts:-
       nl, nl,
       write('The following are the attributes in all the views'), nl, nl,
       assert(t(0)),
       no_of_ent_atts_1.


no_of_ent_atts_1:-
       view(V, _), nl, nl, nl,
       write('view: '),
       write(V), nl,
       no_of_ent_atts_2(V),
       fail.

no_of_ent_atts_1:-
       retract(t(T)), nl, nl, nl,
       write('Totoal number of attributes in all the views is: '),
       write(T), nl,
       total_no_of_views(N),
       Average is T / N,
       write('Average number of attributes in each view is: '),
       write(Average).
no_of_ent_atts_1.

no_of_ent_atts_2(V):-
       no_of_ent_atts_3(V), !.
```

```
no_of_ent_atts_3(V):-
        ent_att(V,
                    ent(_ , _),
                     att_det(Att, _, _, _)),
        write('Attribute:    '),
        write(Att), nl,
        add_one,
        fail.

no_of_ent_atts_3(_).



no_of_ent_valued_atts:-
        nl, nl,
        write('The following are the attributes with values in all the views'),
nl, nl,
        assert(t(0)),
        no_of_ent_valued_atts_1.


no_of_ent_valued_atts_1:-
        view(V, _), nl, nl, nl,
        write('view: '),
        write(V), nl,
        no_of_ent_valued_atts_2(V),
        fail.

no_of_ent_valued_atts_1:-
        retract(t(T)), nl, nl, nl,
        write('Totoal number of attributes in all the views is: '),
        write(T), nl,
        total_no_of_views(N),
        Average is T / N,
        write('Average number of attributes in each view is: '),
        write(Average).
no_of_ent_valued_atts_1.

no_of_ent_valued_atts_2(V):-
        no_of_ent_valued_atts_3(V), !.


no_of_ent_valued_atts_3(V):-
        ent_att(V,
                    ent(_ , _),
                     att_det(Att, Val, _, _)),
        no_of_ent_valued_atts_4(Att, Val),
        fail.

no_of_ent_valued_atts_3(_).


no_of_ent_valued_atts_4(Att, Val):-
        \+ Val==[],
        write('Attribute:    '),
        write(Att),
        write('          value:  '),
        write(Val), nl,
        add_one, !.

no_of_ent_valued_atts_4(_, _):- !.



no_of_rel_atts:-
        nl, nl,
```

```
      write('The following are the attributes of relationshipsin all the
views'), nl, nl,
      assert(t(0)),
      no_of_rel_atts_1.


no_of_rel_atts_1:-
      view(V, _), nl, nl, nl,
      write('view: '),
      write(V), nl,
      no_of_rel_atts_2(V),
      fail.

no_of_rel_atts_1:-
      retract(t(T)), nl, nl, nl,
      write('Totoal number of attributes of relationships in all the views is:
'),
      write(T), nl,
      total_no_of_views(N),
      Average is T / N,
      write('Average number of attributes in each view is: '),
      write(Average).
no_of_rel_atts_1.

no_of_rel_atts_2(V):-
      no_of_rel_atts_3(V), !.


no_of_rel_atts_3(V):-
      rel_att(V,
                rel(_, _),
                att_det(Att, _, _, _ )),
      write('Attribute:    '),
      write(Att), nl,
      add_one,
      fail.

no_of_rel_atts_3(_).




no_of_ent_rels:-
      nl, nl,
      write('The following are the entity-relationships in all the views'),
nl, nl,
      assert(t(0)),
      no_of_ent_rels_1.


no_of_ent_rels_1:-
      view(V, _), nl, nl, nl,
      write('view: '),
      write(V), nl,
      no_of_ent_rels_2(V),
      fail.

no_of_ent_rels_1:-
      retract(t(T)), nl, nl, nl,
      write('Totoal number of entity-relationships in all the views is: '),
      write(T), nl,
      total_no_of_views(N),
      Average is T / N,
      write('Average number of entity-relationships in each view is: '),
      write(Average).
no_of_ent_rels_1.

no_of_ent_rels_2(V):-
      no_of_ent_rels_3(V), !.
```

```
no_of_ent_rels_3(V):-
      ent_rel(V,
                ent(Ent1, _, _, _),
            rel(Rel, _),
                ent(Ent2, _, _, _)),
      write('Entity-relationship:    '),
      write(Ent1),
      write('          '),
      write(Rel),
      write('          '),
      write(Ent2), nl,
      add_one,
      fail.

no_of_ent_rels_3(_).
```

```
/*                                                                    */
/*     Module  :att_rel_cross_er_conn                                 */
/*     Author  :Mansoor Hassan                                        */
/*     Notes   :This modules searches through the GCS to find if any  */
/*              attribute of an entity also exists as a relationship  */
/*              name in the schema.                                   */
/*              The modules checks if the attribute is the only       */
/*              key attribute, if it is, then the decision is referred*/
/*              to the designer. Otherwise, the attribute is deleted. */
```

```
att_as_rel_er_conn :-
     ent_att_names(E, A),      % extract next entity and its attribute
     att_as_rel_of_ent(E, A),     % see if att A exists as a relationship
     fail.
att_as_rel_er_conn.
```

```
       % See if the attribute A of entity E exists as a relationship R
       % att A is a key att, but E has another key att.
att_as_rel_of_ent(E, A) :-
           % extract the relationship which involves E, which is = to A
     rel_involves_ent(E, A),      % There is a rel R which is equal to att A,
                          % s.t. R involves A
     ent_att_det_s(E, att(A, V, key, _)),      % att A of ent E has no value
                                    % and is a key att
     V=[],
     ent_att_det_s(E, att(A1, _, key, _)),    % E has at least one other key att
     \+ A=A1,     % Make sure it is a different attribute

     retract(att_names_s(A)),
     retract(ent_att_names(E, A)),       % remove att A from ent E
     retract(ent_att_det_s(E, att(A, _, _, _))),     % remove att A details
     nl, nl, nl, nl,
     write(['The attribute  ', A, '  which belonged to entity  ', E]), nl,
     write(['existed as the relationship name  ', A]), nl,
     write(['and  ', A, '  is involved in entity ', E]), nl,
     write(['attribute  ', A,  '  is a key attribute']),nl,
     write(['BUT, the entity  ', E, '  has other key attributes, eg,  ', A1]),
     nl, nl,
     write([' solution:  the attribute  ', A,  'was removed from entity ', E]),
     nl,
     !.
```

```
       % See if the attribute A of entity E exists as a relationship R
att_as_rel_of_ent(E, A) :-
           % extract the relationship which involves E, and is equal to A
     rel_involves_ent(E, A),      % There is a rel R which is equal to
                          % att A, s.t. R involves A
     ent_att_det_s(E, att(A, [], notkey, _)), % att A of ent E has no value
                                    % and is not a key att

     retract(att_names_s(A)),
     retract(ent_att_names(E, A)),       % remove att A from ent E
     retract(ent_att_det_s(E, att(A, _, notkey, _))),       % remove att A
details
     nl, nl, nl,
     write(['The attribute  ', A, '  which belonged to entity  ', E]), nl,
     write(['existed as the relationship name  ', A]), nl,
     write(['and  ', A, '  is involved in entity ', E]), nl,
     write([' solution:  the attribute  ', A,  'was removed from entity ', E]),
     nl,
```

```
    !.


      % See if the attribute A of entity E exists as a relationship R
      % att A is a key att, but E has no other key att.
att_as_rel_of_ent(E, A) :-
          % extract the relationship which involves E
     rel_involves_ent(E, A),      % There is a rel R which is equal to att A,
                                  % s.t. R involves A
     ent_att_det_s(E, att(A, [], key, _)),     % att A of ent E has no value
                                               % and is a key att
     \+ ent_att_det_s(E, att(A1, _, key, _)), % E has no other key
                                               % att
     \+ A=A1,
     att_as_rel_DBA(E, A), !.




          % Find if the relationship R involves E
          % BUT R here is unified with A, as a direct way of establishing
          % if A is the same as the relationship R involving E


rel_involves_ent(E, R) :-
     ent_rel_s(ent1(E, _, _),
       rel(R),
         ent2(E, _, _)).


rel_involves_ent(E, R) :-
     ent_rel_s(ent1(E, _, _),
       rel(R),
         ent2(_, _, _)).

rel_involves_ent(E, R) :-
     ent_rel_s(ent1(_, _, _),
       rel(R),
         ent2(E, _, _)).



      % attribute A of entity E exists as a relationship R
      % att A is a key att, but E has no other key att.,
      % so, ask the DBA for decision
att_as_rel_DBA(E, A) :-
     nl, nl, nl,
     write(['The attribute  ', A, '  which belonged to entity  ', E]), nl,
     write(['existed as the relationship name  ', A]), nl,
     write(['and  ', A, '  is involved in entity ', E]), nl,
     write(['BUT, ', E, '  has no other key attribute']),nl,
     write([' do you want to :']),nl,
     write([' 1.  let VIM remove attribute ', A]),nl,
     write([' 2.  leave attribute as it is ']), nl,
     write([' 3.  change attribute name']), nl,
     write([' 4.  change relationship name']), nl,
     read(Reply),
     att_as_rel_DBA_2(E, A, Reply).



att_as_rel_DBA_2(E, A, Reply) :-
     act_on_reply(E, A, Reply).

att_as_rel_DBA_2(_, _, _).
```

```
act_on_reply(E, A, 1) :-
     retract(ent_att_names(E, A)),       % remove att A from ent E
     retract(ent_att_det_s(E, att(A, _, _))). % remove att A details


      % The designer wants to leave attribute name as it is
act_on_reply(_, _, 2) :- !.


act_on_reply(E, A, 3) :-
     nl, nl, nl,
     write(['You have requested to change the name of attribute  ', A]), nl,
     write(['Enter the name you want the attribute to have']), nl,
     read(New_att_name),
     retract(ent_att_names(E, A)),       % remove att A from ent E
      assert(ent_att_names(E, [New_att_name])),       % replace by new att name
     retract(ent_att_det_s(E, att(A, V, K))), % remove old att det
     assert(ent_att_det_s(E, att([New_att_name], V, K))), % replace by new att
                                                % name
     nl, nl,
     write(['The old attribute name  ', A]), nl,
     write(['was replaced by the new attribute name  ', [New_att_name]]),
     nl,nl.


act_on_reply(_E, A, 4) :-
     nl, nl,
     write(['You have requested to change the name of relationship  ', A]), nl,
     write(['Enter the name you want the relationship to have']), nl,
     read(New_rel_name),
     replace_rel_name(A, [New_rel_name]).
```

```
/*                                                                    */
/*     Module  : att_rel_cross_no_er_conn                             */
/*     Author  : Mansoor Hassan                                       */
/*     Notes   : This module checks to see if any of the attribute of */
/*               any of the entities exists as a relationship,        */
/*               BUT, such relationship is not involved in the entity */
/*               of the attribute under consideration                 */



att_as_rel_no_er_conn :-
     ent_att_names(E, A),     % extract next entity and its attribute
     att_as_rel_no_er_conn_1(E, A),     % see if att A exists as a relationship
    fail.
att_as_rel_no_er_conn.



      % Check if the attribute A exists as a relationship
      % If it does, continue with integration
att_as_rel_no_er_conn_1(E, A) :-
     ent_rel_s(ent1(_, _, _),
               rel(A),
      ent2(_, _, _)),

     \+ rel_involves_ent(E, A),   % There is a rel R which is equal to
                                  % att A, s.t. R involves A
     ent_att_det_s(E, att(A, [], _, _)), % att A of ent E has no value
                                         % and is not a key att

     att_as_rel_no_er_conn_2(E, A), !.


att_as_rel_no_er_conn_2(E, A) :-
     nl, nl, nl, nl,
      write('ATTRIBUTE-RELATIONSHIP CROSS OBJECT TYPE CONFLICT'), nl, nl,
     write(['The attribute  ', A, '  of entity  ', E]), nl,
     write(['exists as a relationship of the same name as the attribute']), nl,
     write(['AND the relationship concerned does not involve the entity  ']),
    nl,
     write([E, '  of the attribute concerned']), nl, nl,
     write(['The solution to such a conflict cannot be taken by VIM']), nl,
     write(['Therefore, Please answer thefollowing :']), nl, nl,
    write([' 1.  Remove attribute from entity  ', E]), nl,
    write([' 2.  Change attribute name']), nl,
    write([' 3.  Change relationship name']), nl,
    write([' 4.  Leave attribute and relationship names as they are']),nl,
     write(['ENTER your order by typing the appropriate number']), nl, nl,
     read(Reply),
      att_as_rel_no_er_conn_3(E, A, Reply).


att_as_rel_no_er_conn_3(E, A, 1) :-
      retract(att_names_s(A)),
      retract(ent_att_det_s(E, att(A, _, _, _))),
      retract(ent_att_names(E, A)), nl,
     write(['The attribute  ', A, '  was removed from entity  ', E]).

att_as_rel_no_er_conn_3(E, A, 2) :-
     write('Enter the new attribute name:  '),
     read(New_att),
      replace_att_name_of_ent(E, A, [New_att]),
      replace_att_name_of_ent_att_det(E, A, [New_att]).


att_as_rel_no_er_conn_3(_, A, 3) :-
     nl, nl,
```

```
     write('Enter the new relationship name to replace the old name:   '),
     read(New_rel_name),
     replace_rel_name(A, [New_rel_name]).


att_as_rel_no_er_conn_3(_, _, 4) :- !.

att_as_rel_no_er_conn_3(E, A, _) :-
    nl, nl,
     write([' YOU HAVE MADE THE WRONG CHOICE, RETRY']), nl, nl,
     att_as_rel_no_er_conn_2(E, A).
```

```
/*   Module   : att_val_as_ent_rel.pl                                    */
/*   Author   : Mansoor Hassan                                           */
/*   Notes    : This module checks all the valued attributes to see      */
/*              if they exist as an entity-relationship, that is,        */
/*              to see if the attribute exists as arelationship and      */
/*              if any of the values of the attribute exist as entities  */
/*              such that, these entities are involved in a relationship */
/*              with the entity of the attribute concerned.              */


:- dynamic removed_att/1.



att_val_as_ent_rel :-
       ent_att_names(E, A),
       att_val_as_ent_rel_1(E, A),
       fail.
att_val_as_ent_rel.


           % check if
           % A exists as rel, which involves E, and A has values
att_val_as_ent_rel_1(E, A) :-
       ent_rel_s(ent1(_, _, _), rel(A), ent2(_, _, _)),     %A exists as rel
       rel_involves_ent(E, A),    % There is a rel R which is equal to att A,

                          % s.t. R involves A
       ent_att_det_s(E, att(A, Vals, _, _)),   % get att values
       \+ Vals=[],  % Vals not equal to nil
       att_val_as_ent_rel_2(E, A, Vals), !.

att_val_as_ent_rel_1(_, _).


att_val_as_ent_rel_2(E, A, Vals) :-
       handle_att_vals(E, A, Vals, Vals),
       remove_att_vals(E, A, Vals).
att_val_as_ent_rel_2(_, _, _).
     .



handle_att_vals(E, A, Vals, [V|Rest_vals]) :-
       handle_att_vals_1(E, A, Vals, V),
       Rest_vals=[],
       handle_att_vals(E, A, Vals, Rest_vals).
handle_att_vals(_, _, _, _).



handle_att_vals_1(E, A, Vals, V) :-
       value_as_ent_of_rel(E, A, [V]),
       delete(Vals, V, New_vals),

           % att_val exists as an ent-rel
       nl, nl, nl,
       write(['The attribute: ', A, '  of entity: ', E]), nl,
       write(['has a value: ', V]), nl,
       write(['and exists an an entity relationship']), nl, nl,
       write(['The value: ', V, '  was removed from attribute: ', A]), nl,
       retract(ent_att_det_s(E, att(A, _, K, P))),
       assertz(ent_att_det_s(E, att(A, New_vals, K, P))),
       assertz(removed_att(A)).

handle_att_vals_1(_, _, _, _).



value_as_ent_of_rel(E, A, V1) :-
```

```
        rel_involves_ent(E, A),      % where A is entity and A is relationship
        \+ V1=E,      % Make sure that V1 and E are not the same entity
        rel_involves_ent(V1, A), !.   % where V1 is entity and A is relationship
                                      % This checks that V1 is an entity involved
                                      % in relationship A


remove_att_vals(E, A, Vals) :-
        removed_att(_),
        remove_att_ass,
        ent_att_det_s(E, att(A, Vals, _, _)),   % get att values
        Vals=[],

        nl,
        write(['The attribute: ', A, '  was removed from entity: ', E]), nl,
        write(['Because all the values of attribute: ', A]), nl,
        write(['Also existed as entities']), nl,
        retract(att_names_s(A)),
        retract(ent_att_det_s(E, att(A, _, _, _))),
        retract(ent_att_names(E, A)), nl.


            % remove the assertions that an attribute value was removed
            % from the attribute
remove_att_ass:-
     retract(removed_att(_)),
    fail.
remove_att_ass.
```

```
/*   Module:  ent_att_cross                                              */
/*   Author:  Mansoor Hassan                                             */
/*   Notes :  This module searches through the integrated schema         */
/*            to find any attribute which also exists as an entity.      */
/*            Should a cross object type definition be found such that   */
/*            an attribute exists as an entity, the designer is asked to */
/*            to intervene.                                              */


ent_att_cross :-
      setof(E, ent_names_s(E, _), Ents_set), % find the set of all ents
      ent_att_cross_1(Ents_set).

ent_att_cross.


ent_att_cross_1(Ents_set) :-
      att_names_s(A),            % Find next attribute
      ent_att_cross_2(Ents_set, A),
      fail.

ent_att_cross_1(_).



ent_att_cross_2(Ents_set, A) :-
      member(A, Ents_set),              % Is A declared as entity,
                                % ie, there is Entity E=A
      ent_att_cross_found(A, Ents_set),    %Found ent att cross, so handle
      !.
ent_att_cross_2(_, _) :- !.



            % Found entity attribute cross object definition.
            % The attribute is equal to its own entity
ent_att_cross_found(A, _) :-
      own_ent(A).



            % Found entity atnl, atribute cross object definition.
            % Where the entity is not the owner of A
ent_att_cross_found(A, _) :-
      foreign_ent(A).



            % Found entity attribute cross object definition.
            % The attribute is equal to its own entity
own_ent(A):-
      ent_att_names(A, A),
      own_ent_DBA(A).


foreign_ent(A) :-
      ent_att_names(E, A),
      foreign_ent_DBAA(E, A).
foreign_ent(_).


            % VIM cant make a decision on own ent of att situation
            % DBA is requested to intervene
own_ent_DBA(A):-
      nl, nl, nl, nl,
      write(['ENTITY ATTRIBUTE CROSS TYPE DEFINITION']), nl, nl,
      write(['The entity  ', A, '   exists as the attribute  ', A]), nl, nl,
      write(['And the entity: ', A, '  own attribute: ', A]), nl, nl,
      write(['This could mean any of three things']), nl,
```

```
        write(['     1.      The entity is wrongly named']),nl,
        write(['     2.      The attribute is wrongly named']), nl,
        write(['     3.      The Owner entity  ', A, '  of attribute  ', A]), nl,
        write(['      is or should be linked to entity  ', A]), nl, nl, nl,
        write(['CHOOSE any of the following:']), nl, nl,
        write(['     1.  DELETE the attribute  ', A]), nl,
        write(['     2.  CHANGE the name of the attribute  ', A]), nl,
        write(['     3.  CHANGE the name of the entity  ', A]), nl,
        write(['     4.      Accept the situation']), nl,
        read(Reply),
        foreign_ent_DBA_2_reply(A, A, _, Reply).


foreign_ent_DBAA(E, A):-
        foreign_ent_DBA(E, A),
        !.


foreign_ent_DBA(E, A) :-
        rel_between_ents(E, A, Rels), % Where A is the ent
                                      % which is = to att A of E
        foreign_ent_DBA_1(E, A, Rels).

foreign_ent_DBA(_, _).


            % Find all the relationships involving E of A (if any)
rel_between_ents(E, A, Rel_set) :-
        setof(R, ent_rel_s(ent1(E, _, _), rel(R), ent2(A, _, _)), Rel_set).

rel_between_ents(E, A, Rel_set) :-
        setof(R, ent_rel_s(ent1(A, _, _), rel(R), ent2(E, _, _)), Rel_set).



            % Relationshp(s) exist between ent E and ent A
foreign_ent_DBA_1(E, A, Rels) :-
        var(Rels),
        foreign_ent_DBA_2(E, A, Rels).


            % No relationship(s) exist between ent E and ent A
foreign_ent_DBA_1(E, A, _) :-
        foreign_ent_DBA_3(E, A).



            % Relationshp(s) Rels exist between ent E and ent A
foreign_ent_DBA_2(E, A, Rels) :-
        nl, nl, nl, nl,
        write(['ENTITY ATTRIBUTE CROSS TYPE DEFINITION']), nl, nl,
        nl, nl,
        write(['The attribute  ', A, '  of entity  ', E]), nl,
        write(['   exists as the attribute  ', A]), nl, nl,
        write(['BUT:The entity  ', E, '  of attribute  ', A]), nl,
        write(['     is connected to entity  ', A]), nl,
        write(['     by the relationship(s):  ', Rels]), nl, nl,
        write(['This is a good indication that the attribute  ', A]), nl,
        write(['is not needed to define the entity  ', E]), nl, nl,
        write(['CHOOSE any of the following:']), nl, nl,
        write(['     1.  DELETE the attribute  ', A]), nl,
        write(['     2.  CHANGE the name of the attribute  ', A]), nl,
        write(['     3.  CHANGE the name of the entity  ', A]), nl,
        write(['     4.      Accept the situation']), nl,
        read(Reply),
        foreign_ent_DBA_2_reply(E, A, Rels, Reply).
```

```
foreign_ent_DBA_2_reply(E, A, _, 1) :-
      delete_att_of_ent(E, A).


foreign_ent_DBA_2_reply(E, A, _, 2) :-
      nl, nl, nl,
      write(['The name of the attribute you wish to change is  ', A]), nl,
      write(['of entity  ', E]), nl, nl,
      write(['Enter the new attribute name to replace the old name: ']),
      read(New_att),
      replace_att_name_of_ent(E, A, [New_att]),
      replace_att_name_of_ent_att_det(E, A, [New_att]).



foreign_ent_DBA_2_reply(E, _, _, 3) :-
      nl, nl, nl,
      write(['You have requested to change the name of entity  ', E]), nl,
      write('Enter the new entity name to replace the old name:  '),
      read(New_ent_name),
      replace_ent_name(E, [New_ent_name]).


foreign_ent_DBA_2_reply(_, _, _, 4).


foreign_ent_DBA_2_reply(E, A, Rels, _) :-
      write(['YOU HAVE MADE THE WRONG CHOICE< PLEASE TRY AGAIN']),
      foreign_ent_DBA_2(E, A, Rels).


          % No relationship(s) exist between ent E and ent A
foreign_ent_DBA_3(E, A) :-
      nl, nl, nl, nl,
      write(['ENTITY ATTRIBUTE CROSS TYPE DEFINITION']), nl, nl,
      nl, nl,
      write(['The attribute  ', A, '  of entity  ', E]), nl,
      write(['   exists as the entity  ', A]), nl, nl,
      write(['BUT:The entity  ', E, '  of attribute  ', A]), nl,
      write(['     is NOT connected to entity  ', A]), nl,
      write(['     by ANY relationship(s):  ']), nl, nl,
      write(['CHOOSE any of the following:']), nl,
      write(['     1.  DELETE the attribute  ', A]), nl,
      write(['     2.  CHANGE the name of the attribute  ', A]), nl,
      write(['     3.  CHANGE the name of the entity  ', A]), nl,
      write(['     4.  CHANGE the name of the entity  ', E]), nl,
      write(['     5.     Accept the situation']), nl,
      write(['     6.     CREATE a relationship between ', E, '  and  ', A]),
      nl,
                              % A is entity and attribute (cross obj.)
      read(Reply),
      foreign_ent_DBA_3_reply(E, A, Reply).


foreign_ent_DBA_3_reply(E, A, 1) :-
      delete_att_of_ent(E, A).


foreign_ent_DBA_3_reply(E, A, 2) :-
      nl, nl, nl,
      write(['The name of the attribute you wish to change is  ', A]), nl,
      write(['of entity  ', E]), nl,
      write(['Enter the new attribute name to replace the old name:  ']),
      read(New_att),
      replace_att_name_of_ent(E, A, [New_att]),
      replace_att_name_of_ent_att_det(E, A, [New_att]).
```

```
foreign_ent_DBA_3_reply(E, _, 3) :-
       nl, nl, nl,
       write(['You have requested to change the name of entity  ', E]), nl,
       write('Enter the new entity name to replace the old name:  '),
       read(New_ent_name),
       replace_ent_name(E, [New_ent_name]).


foreign_ent_DBA_3_reply(E, _, 4) :-
       nl, nl, nl,
       write(['You have requested to change the name of entity  ', E]), nl,
       write('Enter the new entity name to replace the old name:  '),
       read(New_ent_name),
       replace_ent_name(E, [New_ent_name]).

foreign_ent_DBA_3_reply(_, _, 5).


             % CREATE a relationship between E and A
foreign_ent_DBA_3_reply(_E, _A, 6).


foreign_ent_DBA_3_reply(E, A, _) :-
       write(['YOU HAVE MADE THE WRONG CHOICE< PLEASE TRY AGAIN']),
       foreign_ent_DBA_3(E, A).
```

```
/*  Module:  ent_rel_cross                                              */
/*  Author:  Mansoor Hassan                                             */
/*  Notes :  This module searches through the integrated schema         */
/*           to find any entities which also exists as an relationships. */
/*           Should a cross object type definition be found such that   */
/*           an entity exists as a relationship name, the designer is   */
/*           asked to intervene.                                        */
/*           However, The designer is informed of the posssibilities of */
/*           the solutions he/she can take to suit the type of conflict. */



ent_rel_cross :-
      setof(E, ent_names_s(E, _), Ents_set), % find the set of all ents
      ent_rel_cross_1(Ents_set).

ent_rel_cross.


ent_rel_cross_1(Ents_set) :-
      ent_rel_s(ent1(_, _, _), rel(R), ent2(_, _, _)),     % Next rel
      ent_rel_cross_2(Ents_set, R),
      fail.

ent_rel_cross_1(_).



ent_rel_cross_2(Ents_set, R) :-
      member(R, Ents_set),              % Is R declared as entity,
                                % ie, there is Entity E=R
      ent_rel_cross_found(R, Ents_set),    %Found ent att cross, so handle
      !.
ent_rel_cross_2(_, _) :- !.


            % Found entity attribute cross object definition.
            % The attribute is equal to its own entity
ent_rel_cross_found(R, _) :-
      own_ent_rel(R).


            % Found entity atn1, atribute cross object definition.
            % Where the entity is not the owner of A
ent_rel_cross_found(R, _) :-
      foreign_ent_rel(R).


            % Found entity attribute cross object definition.
            % The attribute is equal to its own entity
own_ent_rel(R):-
      rel_involves_ent(R, R),          % Since R=E
      own_ent_rel_DBA(R).


foreign_ent_rel(A) :-
      ent_att_names(E, A),
      foreign_ent_DBA(E, A).


            % VIM cant make a decision on own ent of att situation
            % DBA is requested to intervene
own_ent_rel_DBA(R):-
      nl, nl, nl, nl,
      write(['ENTITY RELATIONSHIP CROSS TYPE DEFINITION']), nl, nl,
```

```
        write(['The entity   ', R, '   exists as the relationship   ', R]), nl,
        write(['The entity   ', R, '   is involved in relationship   ', R]),
        nl, nl,

        write(['This could mean any of three things']), nl,
        write(['     1.      The entity is wrongly named']),nl,
        write(['     2.      The relationship is wrongly named']), nl, nl,
        write(['CHOOSE any of the following:']), nl, nl,
        write(['     1.  CHANGE the name of the entity   ', R]), nl,
        write(['     2.  CHANGE the name of the relationship   ', R]), nl,
        write(['     3.      Accept the situation']), nl,
        read(Reply),
        own_ent_rel_DBA_reply(R, Reply).


own_ent_rel_DBA(_).




own_ent_rel_DBA_reply(R, 1) :-
        write('Enter the new entity name to replace the old name:   '),
        read(New_ent_name),
        replace_ent_name(R, [New_ent_name]).


own_ent_rel_DBA_reply(R, 2) :-
        write('Enter the new relationship name to replace the old name:   '),
        read(New_rel_name),
        replace_rel_name(R, [New_rel_name]).



own_ent_rel_DBA_reply(_, 3).


own_ent_DBA_reply(R, _) :-
        own_ent_rel_DBA(R).
```

```
/*      Module : cardinality_handling                                          */
/*      Author : Mansoor Hassan                                                */
/*      Notes  : This module matcher the two relationships entities            */
/*               cardinalities.                                               */
/*               The two rels are the view and schema rels being compared     */



            % match the cardinalities of the corresponding ents.
            % If no card is given for for schema ent, then assert schema
            % ent cardinality from view ent.
            % If different cards then consult DBA
match_and_assert_ent_cards(V_name, Rel_names, Rel_occ, Ent_names, Ent_occ,
                                                Rel_names_s, Ent_s) :-

                % extract the cardinality of the view rel ent
      extract_view_rel_ent_cards(V_name, Rel_names, Rel_occ,
            Ent_names, Ent_occ, Ent_card),

                % extract the cardinality of the schema rel ent
      extract_schema_rel_ent_cards(Rel_names_s, Ent_s, Ent_card_s),

                % assert view rel cardinality to schema rel ent
                % if it has no card
                % otherwise report to the DBA the conflict
      assert_schema_ent_card(V_name, Rel_names, Rel_occ,
            Ent_names, Ent_occ, Ent_card,
            Rel_names_s, Ent_s, Ent_card_s).



      % assert view rel cardinality to schema rel ent if it has no card
      % otherwise report to the DBA the conflict
assert_schema_ent_card(V_name, Rel_names, Rel_occ,
                Ent_names, Ent_occ, Ent_card,
                      Rel_names_s, Ent_s, Ent_card_s) :-

            %  If the ents cards dont match, then try the history records
            % If no history record of a previous conflict is given, then
            % ask the DBA, to resolve the conflict, and record this fact
      update_ent_rel_card(V_name, Rel_names, Rel_occ,
            Ent_names, Ent_occ, Ent_card,
            Rel_names_s, Ent_s, Ent_card_s).



      % extract the cardinality of the view rel ent
extract_view_rel_ent_cards(V_name, Rel_names, Rel_occ,
                              Ent_names, Ent_occ, Cards) :-

            % left hand side entity
      ent_rel(V_name,
            ent(Ent_names, Ent_occ, Cards, _Ent_stat),
            rel(Rel_names, Rel_occ),
            ent(_, _, _, _)).



      % extract the cardinality of the view rel ent
extract_view_rel_ent_cards(V_name, Rel_names, Rel_occ,
                                    Ent_names, Ent_occ, Cards) :-

            % right hand side entity
      ent_rel(V_name,
            ent(_, _, _, _),
```

```
            rel(Rel_names, Rel_occ),
            ent(Ent_names, Ent_occ, Cards, _Ent_stat)).


      % extract the cardinality of the schema rel ent
extract_schema_rel_ent_cards(Rel_names_s, Ent_s, Ent_cards_s) :-

            % left hand side entity
      ent_rel_s(ent1(Ent_s, Ent_cards_s, _Stat),
            rel(Rel_names_s),
            ent2(_, _, _)).


            % extract the cardinality of the schema rel ent
extract_schema_rel_ent_cards(Rel_names_s, Ent_s, Ent_cards_s) :-

            % right hand side entity
      ent_rel_s(ent1(_, _, _),
            rel(Rel_names_s),
            ent2(Ent_s, Ent_cards_s, _Stat)).


      %     match the status of the corresponding ents.
      %     use the view ent to complement the schema ent stat.
      %     if the two stats disagree then consult DBA
match_and_assert_ent_stat(_V_name, _Ent1_names, _Ent1_occ, _Ent1_s) :- !.


%     This predicate is called by the match_rels predicate, to check if
%     the cardinalities match exactly.
%     This predicate succeeds if the cardinalities of the corresponding
%     entities of the two relationships match.

match_ent_cards(V_name, rel(Rel_names, Rel_occ, _Rel_prio),
                  ent_rel_s(ent1(Ent1_s, _, _),
                  rel(Rel_names_s),
                              ent2(Ent2_s, _, _))) :-


      %     get ent cardinalities of the main schema rel
      ent_rel_s(ent1(Ent1_s, Ent1_cards_s, _),
            rel(Rel_names_s),
            ent2(Ent2_s, Ent2_cards_s, _)),



      ent_rel(V_name,
            ent(Ent1_names, _Ent1_occ, Ent1_cards, _Ent1_stat),
            rel(Rel_names, Rel_occ),
            ent(Ent2_names, _Ent2_occ, Ent2_cards, _Ent2_stat)),


      %     extract the cardinalities of the view rel
      % ent_rel(V_name,
      %     ent(Ent1_names, _Ent1_occ, Ent1_cards, Ent1_stat),
      %     rel(Rel_names, Rel_occ),
      %     ent(Ent2_names, _Ent2_occ, Ent2_cards, Ent1_stat)),

                  % match the cardinality values
      match_ent_cards_val(Ent1_names, Ent2_names, Ent1_s, Ent2_s,
                  Ent1_cards_s, Ent1_cards,
                  Ent2_cards_s, Ent2_cards).
```

```
      % Matches the cardinalities of the corresponding enttities
match_ent_cards_val(Ent1_names, Ent2_names, Ent1_s, Ent2_s,
                    Ent1_cards_s, Ent1_cards,
                    Ent2_cards_s, Ent2_cards) :-

            % match corresponding entities
      multi_name_match(Ent1_names, Ent1_s),
      multi_name_match(Ent2_names, Ent2_s),

            % match  cardinalities of corresponding entities
      multi_name_match(Ent1_cards_s, Ent1_cards),
      multi_name_match(Ent2_cards_s, Ent2_cards).


      % Matches the cardinalities of the corresponding enttities
match_ent_cards_val(Ent1_names, Ent2_names, Ent1_s, Ent2_s,
                    Ent1_cards_s, Ent1_cards,
                    Ent2_cards_s, Ent2_cards) :-

            % match corresponding entity names
      multi_name_match(Ent2_names, Ent1_s),
      multi_name_match(Ent1_names, Ent2_s),

      multi_name_match(Ent1_cards_s, Ent2_cards),
      multi_name_match(Ent2_cards_s, Ent1_cards).
```

```
/*                                                                    */
/*     Module  : change_att_k_stat                                    */
/*     Notes   : This module has the function of changing the names   */
/*                    of any of the attributes , by changing all its  */
/*                    occurences in the schema.                       */



            % This predicate is called by the designer to replace an old
            % attribute name with a new one for a given entity
change_att_k_stat :-
      nl, nl, nl,
      write('Please enter the name of the entity for which the attribute'),
      nl,
      write('name is to be changed'), nl,
      read(E), nl,
      write('Please enter the name of the attribute you wish to change'), nl,
      write('its key status'),
      write('Enter  attribute name :  '),
      read(Att),
      write('Enter the new key status as  key or notkey:  '),
      read(New_k_stat),
      replace_att_of_ent_k_stat(E, Att, New_k_stat),
      replace_att_of_ent_det_k_stat(E, Att, New_k_stat).


          % This predicate can be called directly by VIM to change the name
          % of a given attribute for a known entity.
          % This predicate assumes both the old and new names of the
          % attribute are given
replace_att_of_ent_k_stat(E, Att, New_k_stat) :-
      ent_att_names(E, Att),
      replace_att_name_of_ent_1(E, Att, New_k_stat),
      fail.

replace_att_of_ent_k_stat(_, _, _).


replace_att_of_ent_det_k_stat(E, Att, New_k_stat) :-
      retract(ent_att_names(E, Att)),
      assertz(ent_att_names(E, New_k_stat)), !.



          % Change the name of the attribute to the new name
          % at all the entity attribute details connections
replace_att_name_of_ent_att_det(E, Att, New_k_stat) :-
      ent_att_det_s(E, att(Att, Vals, K, P)),
      replace_att_name_of_ent_att_det_1(E, Att, New_k_stat, Vals, K, P),
      fail.

replace_att_name_of_ent_att_det(_, _, _).


replace_att_name_of_ent_att_det_1(E, Att, New_k_stat, Vals, K, P) :-
      retract(ent_att_det_s(E, att(Att, Vals, K, P))),
      assertz(ent_att_det_s(E, att(New_k_stat, Vals, K, P))), !.
```

```
/*                                                                      */
/*      Module : common_preds                                           */
/*      Notes  : This module holds many predicates that are common to VIM */
/*               Most other modules use these predicates                */
/*                                                                      */

        %       Asserts a fact if it does not already exist
assert_fact(Fact):-
        not_true_fact(Fact),
        assert(Fact).

assert_fact(_):- !.



        %       Asserts a fact if it does not already exist
retract_fact(Fact):-
        retract(Fact), !.

retract_fact(_).


pause:-
     nl, nl,
      write('To continue, please press RETURN'),
     get0(_).


%       prove if a given goal is either true or false
not_true_fact(G):-
        \+  (call(G)).



%       prove that a fact is asserted in the database
true_fact(G):-
        call(G).



length_list([],  0).
length_list([_|T],  X ):-
        length(T, Y), X is Y +1.

        % clear screen
clear_screen :-
        nl, nl, nl, nl,
        write('------------------------------------------------------------'),
        nl.



        % replace a fact in the schema by a new fact
replace_fact(Old_fact,  New_fact)  :-
        retract(Old_fact),
        assert(New_fact).
```

```
      % Consider each view in turn, and comine its entities in the
      % pool.

combine_ents :-
      view(V,_),
      combine(V),
      fail.
combine_ents.


            % Adds all the entities of the current view, to the entity
            % pool, if they do not already exist
combine(V) :-
      ent(V, ent(E, _, _)),      % next entity of current view
      add_to_pool(E),      % add current ent to the entity view pool,
                           % if it does not already exist.
      fail.

combine(_).



add_to_pool(E) :-
      ent_view(E),
      !.           % entity E exists in the entity pool

add_to_pool(E) :-
      assert_fact(ent_view(E)),
      !.                   % entity E does not exist in the entiy

add_to_pool(_).                  % pool, so add it



show:-
      nl,
      ent_view(E),
      write(E),nl,
      fail.



:- use_module(library(lists), [
            remove_dups/2
            ]).


      % load the dynamic objects
:- [dynamic_objects].

      % load the other bvim modules
:- [bvim_modules].


:- dynamic ent_view/1.


      % This is the main predicate for the entity view integration approach.
      % First, it combines all the entities from all the views int what
      % I call the entity pool.
      % The next step is to pick each of the entities from the entity pool
      % and integrate all the relationships involving the current entity
      % considered.
      % Finally, the schema resulting after each entity view integration
      % task is completed is displayed.
```

```
ent_view :-
       combine_ents_from_views,
       ent_view_integ,
       show_schema.

ent_view.



       % Consider each view in turn, and comine its entities in the
       % pool.

combine_ents_from_views :-
       view(V,_),
       combine_entities(V),
       fail.

combine_ents_from_views.



combine_entities(V) :-
       combine_ents(V),
       !.



             % Adds all the entities of the current view, to the entity
             % pool, if they do not already exist
combine_ents(V) :-
       ent(V, ent(E, _, _)),      % next entity of current view
       add_to_ent_pool(E),        % add current ent to the entity view pool,
                          % if it does not already exist.
       fail.

combine_ents(_).



add_to_ent_pool(E) :-
       ent_view(E), % entity E exists in the entity pool
       !.


add_to_ent_pool(E) :-
       assert_fact(ent_view(E)), % entity E does not exist in the entiy
       !.                        % pool, so add it

add_to_ent_pool(_).



             % consider all ents and start the entity view integration
ent_view_integ :-
       ent_view(E), % next entity
       integ_rels_of_ent_view(E),       % integrate all the rels involving the
                                 % current entity E.
       show_latest_schema(E),
       fail.

ent_view_integ.



show_latest_schema(E):-
       nl, nl, nl, nl, nl,
       write(['The schema after adding entity  ', E]),
       show_schema,
```

```
        !.

show_latest_schema.



            % integrate all the rels involving the current entity
integ_rels_of_ent_view(E)  :-

            % extract the next rel details from any view
        ent_rel(V,
            ent(E1, E1_occ, E1_card, E1_stat),
            rel(R, R_occ),
            ent(E2, E2_occ, E2_card, E2_stat)),


            % check to see if extracted rel involves current entity E
            % and if so, then match integ this rel against the main schema
        match_ents_and_integ_rels(V, E,
                            E1, E1_occ, E1_card, E1_stat,
                            R, R_occ,
                            E2, E2_occ, E2_card, E2_stat),

        fail.


integ_rels_of_ent_view(_).



            % check to see if extracted rel involves current entity E
            % and if so, then match integ this rel against the main schema
match_ents_and_integ_rels(V, E,
                    E1, _E1_occ, _E1_card, _E1_stat,
                    R, R_occ,
                    E2, _E2_occ, _E2_card, _E2_stat)  :-

                    % Is current entity E involves in the current rel
        current_rel_involves_ent(E, E1, E2),

                    % current rel involves current ent, hence,
                    %  match and integrate it with the main schema
        integ_current_rel(V, R, R_occ), !.


match_ents_and_integ_rels(_, _, _, _, _, _, _, _, _, _, _, _).



            % test if current entity E is involved in the current rel.
            % This is done by checking that current ent is equal
            % to one of the two entities E1 and E2 which are part of
            % current rel

current_rel_involves_ent(E, E1, _E2)  :-
        multi_name_match(E, E1).

current_rel_involves_ent(E, _E1, E2)  :-
        multi_name_match(E, E2).



            % current rel involves current ent, hence,
            %  match and integrate it with the main schema
integ_current_rel(V, R, R_occ)  :-
```

```
            % extract current rel other details before integration
      rel(V, rel(R, R_occ, R_prio)),

      match_current_rel_with_schema(V, rel(R, R_occ, R_prio)), !.

integ_current_rel(_, _, _).



%     match the current view contents with the main schema
match_current_rel_with_schema(V_name, rel(Rel_names, Rel_occ, Rel_prio)):-

      match_view_and_schema_rels(V_name, rel(Rel_names, Rel_occ, Rel_prio)),

      found_different_rel(V_name, rel(Rel_names, Rel_occ, Rel_prio)),
      !.

match_current_rel_with_schema(_, _).



match_view_and_schema_rels(V_name, rel(Rel_names, Rel_occ, Rel_prio)) :-

      assert(schema_rels(none)),
      match_view_rel_with_schema(V_name,
            rel(Rel_names, Rel_occ, Rel_prio)), !.

match_view_and_schema_rels(_, _).



      %     Matches the current relationship from the current view
      %     with all the relationships in the main schema.
match_view_rel_with_schema(V_name, rel(Rel_names, Rel_occ, Rel_prio)):-

            %     next relationship from the main schema to be matched.
      ent_rel_s(ent1(Ent1_names_s, Ent1_cards_s, Ent1_stat_s),
            rel(Rel_names_s),
            ent2(Ent2_names_s, Ent2_cards_s, Ent2_stat_s)),

      retract_fact(schema_rels(none)),

      % write('********* considering schema rel  '), nl,
      % write(ent_rel_s(ent1(Ent1_names_s, Ent1_cards_s, Ent1_stat_s),
      %     rel(Rel_names_s),
      %     ent2(Ent2_names_s, Ent2_cards_s, Ent2_stat_s))), nl,nl,

      match_view_rel_with_schema_rels(V_name,
            rel(Rel_names, Rel_occ, Rel_prio),
            ent_rel_s(ent1(Ent1_names_s, Ent1_cards_s, Ent1_stat_s),
            rel(Rel_names_s),
            ent2(Ent2_names_s, Ent2_cards_s, Ent2_stat_s))),


      fail.



match_view_rel_with_schema(V_name, rel(Rel_names, Rel_occ, Rel_prio)) :-
      schema_rels(none),
      retract(schema_rels(none)),
      assert_rel(V_name, rel(Rel_names, Rel_occ, Rel_prio)).

match_view_rel_with_schema(_, _).
```

```
        %       Matches the current relationship from the current view
        %       with all the relationships in the main schema.
match_view_rel_with_schema_rels(V_name, rel(Rel_names, Rel_occ, Rel_prio),
                ent_rel_s(ent1(Ent1_names, Ent1_cards, Ent1_stat),
                rel(Rel_names_s),
                                ent2(Ent2_names, Ent2_cards, Ent2_stat))):-

        match_rels(V_name, rel(Rel_names, Rel_occ, Rel_prio),
                ent_rel_s(ent1(Ent1_names, Ent1_cards, Ent1_stat),
                rel(Rel_names_s),
                ent2(Ent2_names, Ent2_cards, Ent2_stat))),

        found_different_rel(V_name, rel(Rel_names, Rel_occ, Rel_prio)),

        !.

match_view_rel_with_schema_rels(_, _, _).




%       If the current rel of the current view being considered
%       was asserted as different to all the rels in the schema,
%       then this predicate add the view rel to the schema and
%       remove the fact that it is different to all the schema rels.


found_different_rel(V_name, rel(Rel_names, Rel_occ, Rel_prio)):-
        found_match_in_schema(V_name, rel(Rel_names, Rel_occ, Rel_prio)),
        !.

found_different_rel(_, _).



found_match_in_schema(V_name, rel(Rel_names, Rel_occ, Rel_prio)):-
                % extract view rel details
        ent_rel(V_name,

                    ent(Ent1_names, _, _, _),
                rel(Rel_names, Rel_occ),
                    ent(Ent2_names, _, _, _)),

        extract_matching_schema_rel(V_name,
                      Ent1_names, Rel_names, Rel_occ, Ent2_names, Rel_prio),

        !.


found_match_in_schema(_, _).




        % match on both ents and rel
extract_matching_schema_rel(_, Ent1_names, Rel_names, _, Ent2_names, _) :-
                % see if there is a matching schema rel
        ent_rel_s(ent1(Ent1_names, _, _),
                    rel(Rel_names),
                ent2(Ent2_names, _, _)), !.
```

```
        % match on both ents and rel, with ents swapped
extract_matching_schema_rel(_, Ent1_names, Rel_names, _, Ent2_names, _) :-
                % see if there is a matching schema rel
        ent_rel_s(ent1(Ent2_names, _, _),
                  rel(Rel_names),
                ent2(Ent1_names, _, _)), !.


        % recursive rel, on Ent1
extract_matching_schema_rel(_, Ent1_names, Rel_names, _, _Ent2_names, _) :-
                % see if there is a matching schema rel
        ent_rel_s(ent1(Ent1_names, _, _),
                  rel(Rel_names),
                ent2(Ent1_names, _, _)), !.


        % recursive rel on Ent2
extract_matching_schema_rel(_, _Ent1_names, Rel_names, _, Ent2_names, _) :-
                % see if there is a matching schema rel
        ent_rel_s(ent1(Ent2_names, _, _),
                  rel(Rel_names),
                ent2(Ent2_names, _, _)), !.


        % no matching rel in schema for current view rel
        % therefore, add rel to schjema
extract_matching_schema_rel(V_name, _, Rel_names, Rel_occ, _, Rel_prio) :-
        assert_rel(V_name, rel(Rel_names, Rel_occ, Rel_prio)), !.


extract_matching_schema_rel(_, _, _, _, _, _).
```

```
/*      Module          : rel_view                                          */
/*      Notes  : This is the N-ary view relationship view integration       */
/*               approach.                                                  */



:- use_module(library(lists), [
              remove_dups/2
              ]).


        % load the dynamic objects
:- [dynamic_objects].

        % load the other bvim modules
:- [bvim_modules].



:- dynamic rel_view/1.


        % This predicate gathers all the rels from all the view
        % to form the relationship views of the schema

rel_view :-
        combine_rels_from_views,
        rel_view_integ,
        show_schema.

rel_view.



        % considers the next view in order to extract all its relationships
        % to be added to the relationship view

combine_rels_from_views :-
        view(V, _),
        combine_view_rels(V),
        fail.

combine_rels_from_views.


combine_view_rels(V) :-
        combine_rels(V),
        !.



        % extracts a relationship at a time from the current view
combine_rels(V) :-
        rel(V, rel(R, _, _)),
        add_to_rel_pool(R),
        fail.

combine_rels(_) :- !.



        % adds the current relationship name to the relationship pool
        % if it does not already exist
```

```
add_to_rel_pool(R) :-
        rel_view(R),
        !.

add_to_rel_pool(R) :-
        assert_fact(rel_view(R)),
        !.

add_to_rel_pool(_).



        % This predicate extract a relationship name at a time from the rel
        % pool, and then integrates its contents to the schema
rel_view_integ :-
        rel_view(R),
        integ_rels_of_rel_view(R),
        show_latest_schema(R),
        fail.

rel_view_integ :- !.



show_latest_schema(R) :-
        nl,nl,nl,nl,nl,
        write(['The schema after considering rel view of  ', R]),
        show_schema,
        !.

show_latest_schema(_).


integ_rels_of_rel_view(R) :-

                % extract the detailed contents of the current rel
        ent_rel(V,
                ent(E1, E1_occ, _E1_card, E1_stat),
                rel(R, R_occ),
                ent(E2, E2_occ, _E2_card, E2_stat)),

                % integrate the contents of the current rel to the schema
        match_and_integ_rels(V,
                ent(E1, E1_occ, E1_stat),
                rel(R, R_occ),
                ent(E2, E2_occ, E2_stat)),

        fail.

integ_rels_of_rel_view(_).


match_and_integ_rels(V, _, rel(R, R_occ), _) :-

        integ_current_rel(V, R, R_occ),
        !.

match_and_integ_rels(_, _, _, _).



                % current rel involves current ent, hence,
                %  match and integrate it with the main schema
integ_current_rel(V, R, R_occ) :-
```

```
        % extract current rel other details before integration
    rel(V, rel(R, R_occ, R_prio)),

    match_current_rel_with_schema(V, rel(R, R_occ, R_prio)),
    !.

integ_current_rel(_, _, _).



%     match the current view contents with the main schema
match_current_rel_with_schema(V_name, rel(Rel_names, Rel_occ, Rel_prio)):-

    match_view_and_schema_rels(V_name, rel(Rel_names, Rel_occ, Rel_prio)),

    found_different_rel(V_name, rel(Rel_names, Rel_occ, Rel_prio)),
    !.

match_current_rel_with_schema(_, _).



match_view_and_schema_rels(V_name, rel(Rel_names, Rel_occ, Rel_prio)) :-

    assert(schema_rels(none)),
    match_view_rel_with_schema(V_name,
        rel(Rel_names, Rel_occ, Rel_prio)), !.


match_view_and_schema_rels(_, _).



    %     Matches the current relationship from the current view
    %     with all the relationships in the main schema.
match_view_rel_with_schema(V_name, rel(Rel_names, Rel_occ, Rel_prio)):-

        %     next relationship from the main schema to be matched.
    ent_rel_s(ent1(Ent1_names_s, Ent1_cards_s, Ent1_stat_s),
        rel(Rel_names_s),
        ent2(Ent2_names_s, Ent2_cards_s, Ent2_stat_s)),

    retract_fact(schema_rels(none)),

    % write('********* considering schema rel  '), nl,
    % write(ent_rel_s(ent1(Ent1_names_s, Ent1_cards_s, Ent1_stat_s),
    %     rel(Rel_names_s),
    %     ent2(Ent2_names_s, Ent2_cards_s, Ent2_stat_s))), nl,nl,

    match_view_rel_with_schema_rels(V_name,
        rel(Rel_names, Rel_occ, Rel_prio),
        ent_rel_s(ent1(Ent1_names_s, Ent1_cards_s, Ent1_stat_s),
        rel(Rel_names_s),
        ent2(Ent2_names_s, Ent2_cards_s, Ent2_stat_s))),


    fail.



match_view_rel_with_schema(V_name, rel(Rel_names, Rel_occ, Rel_prio)) :-
    schema_rels(none),
    retract(schema_rels(none)),
    assert_rel(V_name, rel(Rel_names, Rel_occ, Rel_prio)).
```

```
match_view_rel_with_schema(_, _).



        %       Matches the current relationship from the current view
        %       with all the relationships in the main schema.
match_view_rel_with_schema_rels(V_name, rel(Rel_names, Rel_occ, Rel_prio),
              ent_rel_s(ent1(Ent1_names, Ent1_cards, Ent1_stat),
              rel(Rel_names_s),
                          ent2(Ent2_names, Ent2_cards, Ent2_stat))):-

        match_rels(V_name, rel(Rel_names, Rel_occ, Rel_prio),
              ent_rel_s(ent1(Ent1_names, Ent1_cards, Ent1_stat),
              rel(Rel_names_s),
              ent2(Ent2_names, Ent2_cards, Ent2_stat))),

        found_different_rel(V_name, rel(Rel_names, Rel_occ, Rel_prio)),

        !.

match_view_rel_with_schema_rels(_, _, _).



%       If the current rel of the current view being considered
%       was asserted as different to all the rels in the schema,
%       then this predicate add the view rel to the schema and
%       remove the fact that it is different to all the schema rels.


found_different_rel(V_name, rel(Rel_names, Rel_occ, Rel_prio)).:-
        found_match_in_schema(V_name, rel(Rel_names, Rel_occ, Rel_prio)),
        !.

found_different_rel(_, _).



found_match_in_schema(V_name, rel(Rel_names, Rel_occ, Rel_prio)):-
              % extract view rel details
        ent_rel(V_name,

                  ent(Ent1_names, _, _, _),
              rel(Rel_names, Rel_occ),
                  ent(Ent2_names, _, _, _)),

        extract_matching_schema_rel(V_name,
                    Ent1_names, Rel_names, Rel_occ, Ent2_names, Rel_prio),

        !.


found_match_in_schema(_, _).



        % match on both ents and rel
extract_matching_schema_rel(_, Ent1_names, Rel_names, _, Ent2_names, _) :-
              % see if there is a matching schema rel
        ent_rel_s(ent1(Ent1_names, _, _),
                  rel(Rel_names),
```

```
            ent2(Ent2_names, _, _)), !.


      % match on both ents and rel, with ents swapped
extract_matching_schema_rel(_, Ent1_names, Rel_names, _, Ent2_names, _) :-
            % see if there is a matching schema rel
      ent_rel_s(ent1(Ent2_names, _, _),
                rel(Rel_names),
            ent2(Ent1_names, _, _)), !.


      % recursive rel, on Ent1
extract_matching_schema_rel(_, Ent1_names, Rel_names, _, _Ent2_names, _) :-
            % see if there is a matching schema rel
      ent_rel_s(ent1(Ent1_names, _, _),
                rel(Rel_names),
            ent2(Ent1_names, _, _)), !.


      % recursive rel on Ent2
extract_matching_schema_rel(_, _Ent1_names, Rel_names, _, Ent2_names, _) :-
            % see if there is a matching schema rel
      ent_rel_s(ent1(Ent2_names, _, _),
                rel(Rel_names),
            ent2(Ent2_names, _, _)), !.



      % no matching rel in schema for current view rel
      % therefore, add rel to schjema
extract_matching_schema_rel(V_name, _, Rel_names, Rel_occ, _, Rel_prio) :-
      assert_rel(V_name, rel(Rel_names, Rel_occ, Rel_prio)), !.


extract_matching_schema_rel(_, _, _, _, _, _).
```

```
view(adminstration, 1).

att(adminstration, [name]).
att(adminstration, [number]).
att(adminstration, ['staff number']).
att(adminstration, ['title.']).
att(adminstration, [position]).
att(adminstration, ['building name']).
att(adminstration, ['room number']).


ent(adminstration, ent([department], 1, 1)).
ent(adminstration, ent([student], 1, 1)).
ent(adminstration, ent([secretaries], 1, 1)).
ent(adminstration, ent([head], 1, 1)).
ent(adminstration, ent([staff], 1, 1)).
ent(adminstration, ent([room], 1, 1)).



ent_att(adminstration, ent([department], 1),
        att_det([name], [], key, 1)).

ent_att(adminstration, ent([department], 1),
        att_det([number], [], key, 1)).

ent_att(adminstration, ent([room], 1),
        att_det(['building name'], [], key, 1)).

ent_att(adminstration, ent([room], 1),
        att_det(['room number'], [], key, 1)).

ent_att(adminstration, ent([secretaries], 1),
        att_det([name], [], key, 1)).

ent_att(adminstration, ent([secretaries], 1),
        att_det(['staff number'], [], key, 1)).

ent_att(adminstration, ent([secretaries], 1),
        att_det(['dept.'], [], notkey, 1)).

ent_att(adminstration, ent([head], 1),
        att_det([name], [], key, 1)).

ent_att(adminstration, ent([head], 1),
        att_det(['staff No.'], [], notkey, 1)).

ent_att(adminstration, ent([staff], 1),
        att_det([name], [], key, 1)).


ent_att(adminstration, ent([staff], 1),
        att_det([title], [], notkey, 1)).

ent_att(adminstration, ent([staff], 1),
        att_det([position], [], notkey, 1)).


ent_att(adminstration, ent([staff], 1),
        att_det([number], [], key, 1)).

rel(adminstration, rel([heads], 1, 1)).
rel(adminstration, rel([employs], 1, 1)).
rel(adminstration, rel(['work in'], 1, 1)).
rel(adminstration, rel(['live in'], 1, 1)).
```

```
ent_rel(adminstration,
        ent([department], 1, [many], []),
                rel([employs], 1),
        ent([secretaries], 1, [many], [])).

ent_rel(adminstration,
        ent([department], 1, [1], []),
                rel([heads], 1),
        ent([head], 1, [1], [])).

ent_rel(adminstration,
        ent([department], 1, [many], []),
                rel(['work in'], 1),
        ent([staff], 1, [1], [])).

ent_rel(adminstration,
        ent([staff], 1, [many], []),
                rel(['live in'], 1),
        ent([room], 1, [many], [])).
```

```
view(admissions, 1).


att(admissions, [name]).
att(admissions, [address]).
att(admissions, [sponsorship]).
att(admissions, [number]).
att(admissions, [date]).
att(admissions, [qualifications]).
att(admissions, [college]).
att(admissions, [course]).
att(admissions, ['date of interview']).
att(admissions, ['receiving date']).
att(admissions, ['room No.']).
att(admissions, [committee]).
att(admissions, ['committee members']).
att(admissions, ['university number']).
att(admissions, [sponsor]).
att(admissions, ['dept.']).
att(admissions, ['date of enrollment']).
att(admissions, [department]).
att(admissions, ['course tutor']).


ent(admissions, ent([person], 1, 1)).
ent(admissions, ent([form], 1, 1)).
ent(admissions, ent(['admissions tutor'], 1, 1)).
ent(admissions, ent(['accepted candidate'], 1, 1)).
ent(admissions, ent([course], 1, 1)).



ent_att(admissions, ent([person], 1),
         att_det([name], [], key, 1)).

ent_att(admissions, ent([person], 1),
         att_det([address], [], notkey, 1)).

ent_att(admissions, ent([person], 1),
          att_det([sponsorship], [private, government, industry, foreign],
                                                    notkey, 1)).
ent_att(admissions, ent([form], 1),
         att_det([number], [], key, 1)).

ent_att(admissions, ent([form], 1),
         att_det([date], [],  notkey, 1)).

ent_att(admissions, ent([form], 1),
          att_det([qualifications], [], notkey, 1)).

ent_att(admissions, ent([form], 1),
         att_det([college], [], notkey, 1)).

ent_att(admissions, ent([form], 1),
         att_det([course], [], notkey, 1)).

ent_att(admissions, ent(['admissions tutor'], 1),
         att_det([name], [], key, 1)).

ent_att(admissions, ent(['admissions tutor'], 1),
         att_det(['room number'], [],  notkey, 1)).

ent_att(admissions, ent(['accepted candidate'], 1),
          att_det(['university number'], ['01-10,000'], key, 1)).

ent_att(admissions, ent(['accepted candidate'], 1),
         att_det([sponsor], [], notkey, 1)).

ent_att(admissions, ent(['accepted candidate'], 1),
         att_det(['dept.'], [], notkey, 1)).
```

```
ent_att(admissions, ent([course], 1),
        att_det([name], [],  key, 1)).

ent_att(admissions, ent([course], 1),
        att_det([department], [], notkey, 1)).

ent_att(admissions, ent([course], 1),
        att_det(['course tutor'], [], notkey, 1)).



rel(admissions, rel(['fills in'], 1, 1)).
rel(admissions, rel([interviews], 1, 1)).
rel(admissions, rel([handles], 1, 1)).
rel(admissions, rel([decision], 1, 1)).
rel(admissions, rel(['registered on'], 1, 1)).



rel_att(admissions,
      rel([interviews], 1), att_det(['date of interview'], [], notkey, 1)).

rel_att(admissions,
      rel([handles], 1), att_det(['receiving date'], [], notkey, 1)).

rel_att(admissions,
      rel([decision], 1), att_det([committee], [], notkey, 1)).

rel_att(admissions,
      rel([decision], 1), att_det(['committee members'], [], notkey, 1)).

rel_att(admissions,
      rel(['registered on'], 1), att_det(['date of enrollment'], [], notkey,
1)).



ent_rel(admissions,
        ent([person], 1, [1], []),
                rel(['fills in'], 1),
        ent([form], 1, [1], [])).


ent_rel(admissions,
        ent([person], 1, [1], []),
                rel([interviews], 1),
        ent(['admisions tutor'], 1, [1], [])).

ent_rel(admissions,
        ent([form], 1, [1], []),
                rel([handles], 1),
        ent(['admisions tutor'], 1, [many], [])).

ent_rel(admissions,
        ent([person], 1, [1], []),
                rel([decision], 1),
        ent(['accepted candidate'], 1, [1], [])).

ent_rel(admissions,
        ent(['accepted candidate'], 1, [1], []),
                rel(['registered on'], 1),
        ent([course], 1, [many], [])).
```

```
view(computers, 1).


att(computers, [use]).
att(computers, [purpose]).
att(computers, [name]).
att(computers, [department]).
att(computers, [make]).
att(computers, ['model number']).
att(computers, ['date of purchase']).
att(computers, ['date of registration']).
att(computers, [course]).
att(computers, ['staff No.']).
att(computers, [grade]).
att(computers, [building]).
att(computers, [number]).



ent(computers, ent([computer], 1, 1)).
ent(computers, ent([mini], 1, 1)).
ent(computers, ent([micro], 1, 1)).
ent(computers, ent(['main frame'], 1, 1)).
ent(computers, ent([application], 1, 1)).
ent(computers, ent(['computer officer'], 1, 1)).


ent_att(computers, ent([computer], 1),
          att_det([use], [research, teaching, general], notkey, 1)).

ent_att(computers, ent([computer], 1),
          att_det([name], [], key, 1)).

ent_att(computers, ent([computer], 1),
          att_det([department], [], key, 1)).

ent_att(computers, ent([micro], 1),
          att_det([make], [], key, 1)).

ent_att(computers, ent([micro], 1),
          att_det(['model number'], [], key, 1)).

ent_att(computers, ent([micro], 1),
          att_det(['date of purchase'], [], notkey, 1)).

ent_att(computers, ent([mini], 1),
          att_det([make], [], key, 1)).

ent_att(computers, ent([mini], 1),
          att_det(['model number'], [], key, 1)).

ent_att(computers, ent([mini], 1),
          att_det(['date of purchase'], [], notkey, 1)).

ent_att(computers, ent(['main frame'], 1),
          att_det([make], [], key, 1)).

ent_att(computers, ent(['main frame'], 1),
          att_det([model], [], notkey, 1)).

ent_att(computers, ent([student], 1),
          att_det([name], [], key, 1)).

ent_att(computers, ent([student], 1),
          att_det([department], [], key, 1)).

ent_att(computers, ent([student], 1),
          att_det([department], [], key, 1)).

ent_att(computers, ent(['computer officer'], 1),
          att_det([name], [], key, 1)).
```

```
ent_att(computers, ent(['computer officer'], 1),
         att_det(['staff number'], [], key, 1)).

ent_att(computers, ent(['computer officer'], 1),
         att_det([grade], [], notkey, 1)).

ent_att(computers, ent([room], 1),
         att_det([building], [], notkey, 1)).

ent_att(computers, ent([room], 1),
         att_det([number], [], key, 1)).

ent_att(computers, ent([application], 1),
         att_det([name], [], key, 1)).

ent_att(computers, ent([application], 1),
         att_det([purpose], [], notkey, 1)).


rel(computers, rel([type], 1, 1)).
rel(computers, rel([type], 2, 1)).
rel(computers, rel([type], 3, 1)).
rel(computers, rel(['in charge of'], 1, 1)).
rel(computers, rel(['registered on'], 1, 1)).
rel(computers, rel([location], 1, 1)).

ent_rel(computers,
         ent([computer], 1, [many], []),
                 rel([type], 1),
         ent([micro], 1, [1], [])).

ent_rel(computers,
         ent([computer], 1, [many], []),
                 rel([type], 2),
         ent([mini], 1, [1], [])).

ent_rel(computers,
         ent([computer], 1, [many], []),
                 rel([type], 3),
         ent(['main frame'], 1, [1], [])).

ent_rel(computers,
         ent([computer], 1, [many], []),
                 rel(['registered on'], 1),
         ent([student], 1, [many], [])).

ent_rel(computers,
         ent([computer], 1, [many], []),
                 rel(['in charge of'], 1),
         ent(['computer officer'], 1, [many], [])).

ent_rel(computers,
         ent([computer], 1, [1], []),
                 rel([location], 1),
         ent([room], 1, [many], [])).
```

```
view(conference, 1).

att(conference, [name]).
att(conference, [course]).
att(conference, [date]).
att(conference, [duration]).
att(conference, [speciality]).
att(conference, [location]).
att(conference, [cost]).
att(conference, [position]).
att(conference, [title]).
att(conference, [author]).
att(conference, ['publisher name']).


ent(conference, ent([student], 1, 1)).
ent(conference, ent([conference], 1, 1)).
ent(conference, ent([staff], 1, 1)).
ent(conference, ent([paper], 1, 1)).



ent_att(conference, ent([student], 1),
          att_det([course], ['computer science'], key, 1)).

ent_att(conference, ent([student], 1),
          att_det([name], [mansoor], key, 1)).


ent_att(conference, ent([conference], 1),
          att_det([date], [january], key, 1)).

ent_att(conference, ent([conference], 1),
          att_det([name], [], key, 1)).

ent_att(conference, ent([conference], 1),
          att_det([duration], [], notkey, 1)).

ent_att(conference, ent([conference], 1),
          att_det([speciality], [], notkey, 1)).

ent_att(conference, ent([conference], 1),
          att_det([location], [], notkey, 1)).

ent_att(conference, ent([conference], 1),
          att_det([cost], [], notkey, 1)).


ent_att(conference, ent([staff], 1),
          att_det([name], [], key, 1)).

ent_att(conference, ent([staff], 1),
          att_det([position], [], notkey, 1)).

ent_att(conference, ent([paper], 1),
          att_det([title], [], key, 1)).

ent_att(conference, ent([paper], 1),
          att_det([author], [], key, 1)).



rel(conference, rel([attends], 1, 1)).
rel(conference, rel([attends], 2, 1)).
rel(conference, rel([writes], 1, 1)).
rel(conference, rel([writes], 2, 1)).
rel(conference, rel([publishes], 1, 1)).
```

```
rel_att(conference,
        rel([publishes], 1), att_det(['publisher name'], [], key, 1)).



ent_rel(conference,
        ent([student], 1, [many], []),
                rel([attends], 1),
        ent([conference], 1, [many], [])).

ent_rel(conference,
        ent([staff], 1, [many], []),
                rel([attends], 2),
        ent([conference], 1, [many], [])).

ent_rel(conference,
        ent([student], 1, [many], []),
                rel([writes], 1),
        ent([paper], 1, [many], [])).

ent_rel(conference,
        ent([staff], 1, [many], []),
                rel([writes], 2),
        ent([paper], 1, [many], [])).


ent_rel(conference,
        ent([conference], 1, [many], []),
                rel([publishes], 1),
        ent([paper], 1, [many], [])).
```

```
view('contract research', 1).

att('contract research', [name]).
att('contract research', ['contact person']).
att('contract research', ['start date']).
att('contract research', [title]).
att('contract research', [amount]).
att('contract research', ['date of submission']).
att('contract research', [type]).
att('contract research', [name]).
att('contract research', [room]).
att('contract research', [department]).
att('contract research', [owner]).
att('contract research', [make]).
att('contract research', [value]).
att('contract research', ['starting date']).


ent('contract research', ent([sponsor], 1, 1)).
ent('contract research', ent([project], 1, 1)).
ent('contract research', ent([researcher], 1, 1)).
ent('contract research', ent([machines], 1, 1)).
ent('contract research', ent([report], 1, 1)).


ent_att('contract research', ent([sponsor], 1),
         att_det([name], [], key, 1)).

ent_att('contract research', ent([sponsor], 1),
         att_det([person], [], notkey, 1)).


ent_att('contract research', ent([project], 1),
         att_det(['start date'], [], notkey, 1)).

ent_att('contract research', ent([project], 1),
         att_det([amount], [], notkey, 1)).

ent_att('contract research', ent([project], 1),
         att_det(['date of submission'], [], notkey, 1)).

ent_att('contract research', ent([researcher], 1),
         att_det([type], [student, staff], notkey, 1)).

ent_att('contract research', ent([researcher], 1),
         att_det([name], [], key, 1)).

ent_att('contract research', ent([researcher], 1),
         att_det([department], [], key, 1)).


ent_att('contract research', ent([machines], 1),
         att_det([owner], [sponsor, staff, department], key, 1)).

ent_att('contract research', ent([machines], 1),
         att_det([make], [], key, 1)).


ent_att('contract research', ent([machines], 1),
         att_det([type], [micro, mini, 'main frame'], notkey, 1)).

ent_att('contract research', ent([machines], 1),
         att_det([value], [], notkey, 1)).


rel('contract research', rel([sponsors], 1, 1)).
rel('contract research', rel([gives], 1, 1)).
rel('contract research', rel([pays], 1, 1)).
```

```
rel('contract research', rel(['works on'], 1, 1)).
rel('contract research', rel([assigned], 1, 1)).
rel('contract research', rel([uses], 1, 1)).


rel_att('contract research',
         rel([pays], 1), att_det([amount], [], notkey, 1)).
rel_att('contract research',
         rel(['works on'], 1), att_det(['starting date'], [], notkey, 1)).


ent_rel('contract research',
         ent([sponsor], 1, [many], []),
                 rel([sponsors], 1),
         ent([project], 1, [many], [])).

ent_rel('contract research',
         ent([sponsor], 1, [many], []),
                 rel([gives], 1),
         ent([researcher], 1, [many], [])).

ent_rel('contract research',
         ent([sponsor], 1, [many], []),
                 rel([pays], 1),
         ent([researcher], 1, [many], [])).

ent_rel('contract research',
         ent([project], 1, [many], []),
                 rel(['works on'], 1),
         ent([researcher], 1, [2], [])).

ent_rel('contract research',
         ent([project], 1, [many], []),
                 rel([assigned], 1),
         ent([machines], 1, [many], [])).

ent_rel('contract research',
         ent([researcher], 1, [many], []),
                 rel([uses], 1),
         ent([machines], 1, [many], [])).
```

```
view('course projects', 1).


att('course projects', [year]).
att('course projects', [type]).
att('course projects', [name]).
att('course projects', [title]).
att('course projects', [course]).
att('course projects', [department]).



ent('course projects', ent([degree], 1, 1)).
ent('course projects', ent([project], 1, 1)).
ent('course projects', ent([student], 1, 1)).
ent('course projects', ent([lecturer], 1, 1)).



ent_att('course projects', ent([degree], 1),
        att_det([year], [], key, 1)).

ent_att('course projects', ent([degree], 1),
         att_det([type], [undergraduate, postgraduate], notkey, 1)).

ent_att('course projects', ent([degree], 1),
        att_det([name], [], key, 1)).

ent_att('course projects', ent([project], 1),
         att_det([type], [major, term], notkey, 1)).

ent_att('course projects', ent([project], 1),
        att_det([title], [], key, 1)).

ent_att('course projects', ent([project], 1),
        att_det([course], [], key, 1)).

ent_att('course projects', ent([student], 1),
        att_det([name], [], key, 1)).

ent_att('course projects', ent([student], 1),
        att_det([year], [], notkey, 1)).

ent_att('course projects', ent([student], 1),
        att_det([course], [], key, 1)).

ent_att('course projects', ent([lecturer], 1),
        att_det([name], [], notkey, 1)).

ent_att('course projects', ent([lecturer], 1),
        att_det([department], [], key, 1)).



rel('course projects', rel(['requirement of'], 1, 1)).
rel('course projects', rel(['carry out'], 1, 1)).
rel('course projects', rel([examination], 1, 1)).
rel('course projects', rel([charge], 1, 1)).



ent_rel('course projects',
       ent([degree], 1, [many], []),
                rel(['requirement of'], 1),
        ent([project], 1, [1], [])).


ent_rel('course projects',
        ent([project], 1, [6], []),
                rel(['carry out'], 1),
        ent([student], 1, [4], [])).
```

```
ent_rel('course projects',
        ent([project], 1, [3], []),
                rel([examination], 1),
        ent([lecturer], 1, [many], [])).


ent_rel('course projects',
        ent([project], 1, [2], []),
                rel([charge], 1),
        ent([lecturer], 1, [many], [])).
```

```
view(graduation, 1).


att(graduation, [name]).
att(graduation, [course]).
att(graduation, ['Dept.']).
att(graduation, [date]).
att(graduation, [place]).
att(graduation, [time]).
att(graduation, [title]).
att(graduation, [level]).



ent(graduation, ent([student], 1, 1)).
ent(graduation, ent([graduation], 1, 1)).
ent(graduation, ent([degree], 1, 1)).



ent_att(graduation, ent([student], 1),
         att_det([name], [], key, 1)).

ent_att(graduation, ent([student], 1),
         att_det([course], [], key, 1)).

ent_att(graduation, ent([student], 1),
         att_det(['Dept.'], [], key, 1)).

ent_att(graduation, ent([graduation], 1),
         att_det([date], [], key, 1)).

ent_att(graduation, ent([graduation], 1),
         att_det([place], [], key, 1)).

ent_att(graduation, ent([graduation], 1),
         att_det([time], [], notkey, 1)).

ent_att(graduation, ent([degree], 1),
         att_det([title], [], key, 1)).

ent_att(graduation, ent([degree], 1),
          att_det([level], [postgraduate, undergraduate], notkey, 1)).



rel(graduation, rel([attends], 1, 1)).
rel(graduation, rel([gains], 1, 1)).
rel(graduation, rel(['given at'], 1, 1)).



ent_rel(graduation,
         ent([student], 1, [1], []),
                 rel([attends], 1),
         ent([graduation], 1, [many], [])).

ent_rel(graduation,
         ent([student], 1, [1], []),
                 rel([gains], 1),
         ent([degree], 1, [many], [])).

ent_rel(graduation,
         ent([degree], 1, [many], []),
                 rel(['given at'], 1),
         ent([graduation], 1, [many], [])).
```

```
view('internal publications', 1).


att('internal publications', [location]).
att('internal publications', [title]).
att('internal publications', ['date of publication']).
att('internal publications', [author]).
att('internal publications', ['number of copies']).
att('internal publications', [editor]).
att('internal publications', [type]).
att('internal publications', [name]).


ent('internal publications', ent(['technical report'], 1, 1)).
ent('internal publications', ent(['research student'], 1, 1)).
ent('internal publications', ent([staff], 1, 1)).



ent_att('internal publications', ent(['technical report'], 1),
         att_det([location], [], notkey, 1)).

ent_att('internal publications', ent(['technical report'], 1),
         att_det([title], [], key, 1)).

ent_att('internal publications', ent(['technical report'], 1),
         att_det(['date of publication'], [], notkey, 1)).

ent_att('internal publications', ent(['technical report'], 1),
         att_det([author], [], key, 1)).

ent_att('internal publications', ent(['technical report'], 1),
         att_det(['number of copies'], ['1-100'],  notkey, 1)).

ent_att('internal publications', ent(['technical report'], 1),
         att_det([editor], [], key, 1)).

ent_att('internal publications', ent(['research student'], 1),
         att_det([name], [], key, 1)).

ent_att('internal publications', ent([staff], 1),
          att_det([type], [lecturer, 'research fellow', 'research assistant'],
notkey, 1)).

ent_att('internal publications', ent([staff], 1),
         att_det([name], [], key, 1)).



rel('internal publications', rel([produces], 1, 1)).
rel('internal publications', rel([produces], 2, 1)).



ent_rel('internal publications',
         ent(['technical report'], 1, [many], []),
                rel([produces], 1),
         ent(['research student'], 1, [many], [])).


ent_rel('internal publications',
         ent(['technical report'], 1, [many], []),
                rel([produces], 2),
         ent([staff], 1, [many], [])).
```

```
view(library, 1).


att(library, [dept]).
att(library, [course]).
att(library, [tutor]).
att(library, [date]).
att(library, [author]).
att(library, [title]).
att(library, [publisher]).
att(library, [name]).
att(library, [subject]).
att(library, [student]).
att(library, [lecturer]).

ent(library, ent([students], 1, 1)).
ent(library, ent([book], 1, 1)).
ent(library, ent([lecturer], 1, 1)).


ent_att(library, ent([students], 1),
         att_det([dept], [], key, 1)).

ent_att(library, ent([students], 1),
         att_det([student], [], key, 1)).

ent_att(library, ent([students], 1),
         att_det([course], [], key, 1)).

ent_att(library, ent([students], 1),
         att_det([tutor], [], key, 1)).

ent_att(library, ent([book], 1),
         att_det([author], [], key, 1)).

ent_att(library, ent([book], 1),
         att_det([student], [], key, 1)).

ent_att(library, ent([book], 1),
         att_det([lecturer], [], key, 1)).

ent_att(library, ent([book], 1),
         att_det([title], [], key, 1)).

ent_att(library, ent([book], 1),
         att_det([publisher], [], key, 1)).

ent_att(library, ent([lecturer], 1),
         att_det([department], [], key, 1)).

ent_att(library, ent([lecturer], 1),
         att_det([name], [], key, 1)).

ent_att(library, ent([lecturer], 1),
         att_det([title], [], key, 1)).


rel(library, rel([borrow], 1, 1)).
rel(library, rel([recommends], 1, 1)).


ent_rel(library,
         ent([students], 1, [1], []),
                 rel([borrow], 1),
         ent([book], 1, [many], [])).

ent_rel(library,
         ent([lecturer], 1, [many], []),
                 rel([recommends], 1),
         ent([book], 1, [many], [])).
```

```
view(publicity, 1).


att(publicity, [name]).
att(publicity, ['advertising date']).
att(publicity, [authoriser]).
att(publicity, [title]).
att(publicity, [contents]).
att(publicity, [place]).
att(publicity, [purpose]).
att(publicity, [cost]).


ent(publicity, ent([staff], 1, 1)).
ent(publicity, ent([advertisement], 1, 1)).


ent_att(publicity, ent([staff], 1),
        att_det([name], [], key, 1)).

ent_att(publicity, ent([advertisement], 1),
         att_det([authoriser], [], notkey, 1)).

ent_att(publicity, ent([advertisement], 1),
         att_det([title], [], key, 1)).

ent_att(publicity, ent([advertisement], 1),
         att_det([contents], [], notkey, 1)).

ent_att(publicity, ent([advertisement], 1),
         att_det([place],
       [journal, magazine, radio, 'television', newspaper],   notkey, 1)).

ent_att(publicity, ent([advertisement], 1),
         att_det([cost], [], notkey, 1)).


rel(publicity, rel([advertises], 1, 1)).


rel_att(publicity,
      rel([advertises], 1), att_det(['advertising date'], [], notkey, 1)).


ent_rel(publicity,
         ent([staff], 1, [1], []),
                  rel([advertises], 1),
         ent([advertisement], 1, [many], [])).
```

```
view(research, 1).

att(research, [name]).
att(research, [supervisor]).
att(research, ['date of submission']).
att(research, ['dept.']).
att(research, [number]).
att(research, [university]).
att(research, [department]).
att(research, [title]).
att(research, ['student name']).
att(research, ['thesis title']).
att(research, ['result']).


ent(research, ent([student], 1, 1)).
ent(research, ent([thesis], 1, 1)).
ent(research, ent([supervisor], 1, 1)).
ent(research, ent([examiner], 1, 1)).
ent(research, ent([report], 1, 1)).


ent_att(research, ent([student], 1),
         att_det([name], [], key, 1)).

ent_att(research, ent([student], 1),
         att_det([supervisor], [], notkey, 1)).


ent_att(research, ent([thesis], 1),
         att_det([title], [], key, 1)).

ent_att(research, ent([thesis], 1),
         att_det(['student name'], [], key, 1)).

ent_att(research, ent([supervisor], 1),
         att_det([name], [], key, 1)).

ent_att(research, ent([supervisor], 1),
         att_det([dept], [], key, 1)).

ent_att(research, ent([examiner], 1),
         att_det([name], [], key, 1)).

ent_att(research, ent([examiner], 1),
         att_det([university], [], notkey, 1)).


ent_att(research, ent([examiner], 1),
         att_det([department], [], notkey, 1)).

ent_att(research, ent([report], 1),
         att_det(['student name'], [], notkey, 1)).


ent_att(research, ent([report], 1),
         att_det(['thesis title'], [], key, 1)).

ent_att(research, ent([report], 1),
         att_det([supervisor], [], key, 1)).

ent_att(research, ent([report], 1),
         att_det([result], [pass, changes, fail], noykey, 1)).



rel(research, rel([submits], 1, 1)).
rel(research, rel(['supervised by'], 1, 1)).
rel(research, rel([viva], 1, 1)).
```

```
rel(research, rel([produces], 1, 1)).


rel_att(research,
         rel([submits], 1), att_det(['date of submission'], [], notkey, 1)).



ent_rel(research,
         ent([student], 1, [many], []),
                 rel([submits], 1),
         ent([thesis], 1, [many], [])).

ent_rel(research,
         ent([student], 1, [3], []),
                 rel(['supervised by'], 1),
         ent([supervisor], 1, [6], [])).

ent_rel(research,
         ent([student], 1, [4], []),
                 rel([viva], 1),
         ent([examiner], 1, [many], [])).

ent_rel(research,
         ent([examiner], 1, [many], []),
                 rel([produces], 1),
         ent([report], 1, [2], [])).
```

```
view(secretarial, 1).


att(secretarial, [name]).
att(secretarial, [room]).
att(secretarial, [type]).
att(secretarial, [owner]).
att(secretarial, ['date of typing']).


ent(secretarial, ent([secretary], 1, 1)).
ent(secretarial, ent([document], 1, 1)).



ent_att(secretarial, ent([secretary], 1),
         att_det([room], [], notkey, 1)).

ent_att(secretarial, ent([secretary], 1),
         att_det([name], [], key, 1)).

ent_att(secretarial, ent([document], 1),
          att_det([type], [letter, report], notkey, 1)).

ent_att(secretarial, ent([document], 1),
         att_det([owner], [], key, 1)).



rel(secretarial, rel([types], 1, 1)).



rel_att(secretarial,
       rel([types], 1), att_det(['date of typing'], [], notkey, 1)).


ent_rel(secretarial,
         ent([secretary], 1, [many], []),
                 rel([types], 1),
         ent([document], 1, [1], [])).
```

```
view(seminars, 1).


att(seminars, [profession]).
att(seminars, [type]).
att(seminars, [name]).
att(seminars, [organization]).
att(seminars, [organizer]).
att(seminars, [location]).
att(seminars, [title]).
att(seminars, [speciality]).
att(seminars, [chairman]).
att(seminars, [duration]).
att(seminars, [date]).


ent(seminars, ent([speaker], 1, 1)).
ent(seminars, ent([seminar], 1, 1)).



ent_att(seminars, ent([speaker], 1),
          att_det([profession], [academic, industrialist], notkey, 1)).

ent_att(seminars, ent([speaker], 1),
          att_det([type], [internal, external], notkey, 1)).

ent_att(seminars, ent([speaker], 1),
         att_det([name], [], key, 1)).

ent_att(seminars, ent([speaker], 1),
          att_det([organization], [], notkey, 1)).

ent_att(seminars, ent([seminar], 1),
          att_det([organizer], [], notkey, 1)).

ent_att(seminars, ent([seminar], 1),
          att_det([location], [], notkey, 1)).

ent_att(seminars, ent([seminar], 1),
         att_det([title], [], key, 1)).

ent_att(seminars, ent([seminar], 1),
          att_det([speciality], [], notkey, 1)).

ent_att(seminars, ent([seminar], 1),
          att_det([chairman], [], notkey, 1)).

ent_att(seminars, ent([seminar], 1),
          att_det([duration], [], notkey, 1)).

ent_att(seminars, ent([seminar], 1),
          att_det([date], [], notkey, 1)).



rel(seminars, rel([presents], 1, 1)).



ent_rel(seminars,
         ent([speaker], 1, [many], []),
                 rel([presents], 1),
         ent([seminar], 1, [1], [])).
```

```
view(teaching, 1).

att(teaching, [name]).
att(teaching, [department]).
att(teaching, [course]).
att(teaching, [head]).
att(teaching, [dept]).
att(teaching, [speciality]).
att(teaching, [year]).
att(teaching, [number]).
att(teaching, ['course name']).
att(teaching, [building]).
att(teaching, [position]).
att(teaching, [level]).
att(teaching, ['part of']).
att(teaching, [activity]).


ent(teaching, ent([course], 1, 1)).
ent(teaching, ent([student], 1, 1)).
ent(teaching, ent([subject], 1, 1)).
ent(teaching, ent([lecturer], 1, 1)).
ent(teaching, ent([equipment], 1, 1)).
ent(teaching, ent([department], 1, 1)).
ent(teaching, ent([lecturer], 2, 1)).
ent(teaching, ent([subject], 2, 1)).
ent(teaching, ent([technician], 1, 1)).


ent_att(teaching, ent([course], 1),
      att_det([department], [], key, 1)).

ent_att(teaching, ent([course], 1),
      att_det([level], [], notkey, 1)).

ent_att(teaching, ent([course], 1),
      att_det(['course name'], [], key, 1)).

ent_att(teaching, ent([student], 1),
      att_det([name], [], key, 1)).

ent_att(teaching, ent([student], 1),
      att_det([course], [], key, 1)).

ent_att(teaching, ent([student], 1),
      att_det([year], [], notkey, 1)).

ent_att(teaching, ent([subject], 1),
      att_det([name], [], key, 1)).

ent_att(teaching, ent([subject], 1),
      att_det(['part of'], [course], key, 1)).

ent_att(teaching, ent([subject], 1),
      att_det([lecturer], [], notkey, 1)).

ent_att(teaching, ent([lecturer], 1),
      att_det([name], [], key, 1)).

ent_att(teaching, ent([lecturer], 1),
      att_det([department], [], key, 1)).

ent_att(teaching, ent([subject], 2),
      att_det([course], [], key, 1)).

ent_att(teaching, ent([subject], 2),
      att_det([name], [], key, 1)).

ent_att(teaching, ent([subject], 2),
      att_det([year], [], key, 1)).
```

```
ent_att(teaching, ent([lecturer], 2),
      att_det([position], [], notkey, 1)).

ent_att(teaching, ent([lecturer], 2),
      att_det([name], [], key, 1)).

ent_att(teaching, ent([lecturer], 2),
      att_det([department], [], key, 1)).

ent_att(teaching, ent([teachnician], 1),
      att_det([speciality], [], notkey, 1)).

ent_att(teaching, ent([technician], 1),
      att_det([name], [], key, 1)).

ent_att(teaching, ent([technician], 1),
      att_det([grade], [], notkey, 1)).

ent_att(teaching, ent([technician], 1),
      att_det([dept], [], key, 1)).

ent_att(teaching, ent([equipment], 1),
      att_det([number], [], key, 1)).

ent_att(teaching, ent([equipment], 1),
      att_det([make], [], notkey, 1)).

ent_att(teaching, ent([equipment], 1),
      att_det([dept], [], key, 1)).

ent_att(teaching, ent([department], 1),
      att_det([name], [], key, 1)).

ent_att(teaching, ent([department], 1),
      att_det([activity], [], notkey, 1)).

ent_att(teaching, ent([department], 1),
      att_det([head], [], key, 1)).



rel(teaching, rel([course], 1, 1)).
rel(teaching, rel([teaches], 1, 1)).
rel(teaching, rel([use], 1, 1)).
rel(teaching, rel(['part of'], 1, 1)).
rel(teaching, rel([repairs], 1, 1)).
rel(teaching, rel([teaches], 2, 1)).
rel(teaching, rel([runs], 1, 1)).
rel(teaching, rel([activity], 1, 1)).
rel(teaching, rel([owns], 1, 1)).
rel(teaching, rel([supervises], 1, 1)).



rel_att(teaching,
      rel([supervises], 1), att_det([place], [], key, 1)).

rel_att(teaching,
      rel([supervises], 1), att_det([time], [], notkey, 1)).

rel_att(teaching,
      rel(['works for'], 1), att_det([year], [], key, 1)).



ent_rel(teaching,
      ent([course], 1, [many], []),
            rel([course], 1),
```

```
      ent([student], 1, [many], [])).


ent_rel(teaching,
      ent([subject], 1, [many], []),
            rel(['part of'], 1),
      ent([course], 1, [many], [])).

ent_rel(teaching,
      ent([department], 1, [many], []),
            rel([runs], 1),
      ent([course], 1, [many], [])).

ent_rel(teaching,
      ent([lecturer], 1, [many], []),
            rel([teaches], 1),
      ent([subject], 1, [many], [])).

ent_rel(teaching,
      ent([student], 1, [many], []),
            rel([use], 1),
      ent([equipment], 1, [many], [])).

ent_rel(teaching,
      ent([department], 1, [many], []),
            rel([owns], 1),
      ent([equipment], 1, [many], [])).

ent_rel(teaching,
      ent([lecturer], 1, [many], []),
            rel([supervises], 1),
      ent(['Ph.D'], 1, [many], [])).


ent_rel(teaching,
      ent([department], 1, [many], []),
            rel([activity], 1),
      ent([teaching], 1, [many], [])).

ent_rel(teaching,
      ent([lecturer], 2, [many], []),
            rel([teaches], 2),
      ent([student], 2, [many], [])).

ent_rel(teaching,
      ent([technician], 1, [many], []),
            rel([repairs], 1),
      ent([equipment], 1, [many], [])).
```

```
view('time table', 1).


att('time table', [name]).
att('time table', [building]).
att('time table', ['room number']).
att('time table', [size]).
att('time table', [subject]).
att('time table', [duration]).
att('time table', [title]).
att('time table', [department]).
att('time table', [occupation]).



ent('time table', ent([department], 1, 1)).
ent('time table', ent(['class room'], 1, 1)).
ent('time table', ent([course], 1, 1)).
ent('time table', ent(['Lab.'], 1, 1)).
ent('time table', ent([subjects], 1, 1)).
ent('time table', ent([lecturer], 1, 1)).
ent('time table', ent([demonstrator], 1, 1)).



ent_att('time table', ent([department], 1),
         att_det([name], [], key, 1)).

ent_att('time table', ent(['class room'], 1),
         att_det([building], [], notkey, 1)).

ent_att('time table', ent(['class room'], 1),
         att_det(['room number'], [], key, 1)).

ent_att('time table', ent(['class room'], 1),
         att_det([size], [], key, 1)).

ent_att('time table', ent([course], 1),
         att_det([name], [], key, 1)).

ent_att('time table', ent(['Lab.'], 1),
         att_det([subject], [], key, 1)).

ent_att('time table', ent(['Lab.'], 1),
         att_det([duration], [1, 2, 3], notkey, 1)).

ent_att('time table', ent([subjects], 1),
         att_det([title], [], key, 1)).

ent_att('time table', ent([lecturer], 1),
         att_det([name], [], key, 1)).

ent_att('time table', ent([lecturer], 1),
         att_det([department], [], key, 1)).

ent_att('time table', ent([demonstrator], 1),
         att_det([name], [], key, 1)).

ent_att('time table', ent([demonstrator], 1),
          att_det([occupation], [technician, 'research student', lecturer],
notkey, 1)).



rel('time table', rel([owner], 1, 1)).
rel('time table', rel(['run by'], 1, 1)).
rel('time table', rel(['given at'], 1, 1)).
rel('time table', rel(['consists of'], 1, 1)).
```

```
rel('time table', rel(['part of'], 1, 1)).
rel('time table', rel(['taught by'], 1, 1)).
rel('time table', rel([gives], 1, 1)).



ent_rel('time table',
         ent([department], 1, [many], []),
                rel([owner], 1),
         ent(['class room'], 1, [1], [])).

ent_rel('time table',
         ent([department], 1, [many], []),
                rel([type], 1),
         ent([course], 1, [3], [])).

ent_rel('time table',
         ent([course], 1, [many], []),
                rel(['consists of'], 1),
         ent([subjects], 1, [1], [])).

ent_rel('time table',
         ent(['class room'], 1, [many], []),
                rel(['given at'], 1),
         ent([subjects], 1, [many], [])).


ent_rel('time table',
         ent(['Lab.'], 1, [many], []),
                rel(['given at'], 1),
         ent(['class room'], 1, [many], [])).

ent_rel('time table',
         ent(['Lab.'], 1, [1], []),
                rel(['part of'], 1),
         ent([subjects], 1, [many], [])).


ent_rel('time table',
         ent(['Lab.'], 1, [2], []),
                rel([gives], 1),
         ent([demonstrator], 1, [many], [])).


ent_rel('time table',
         ent([lecturer], 1, [many], []),
                rel(['taught by'], 1),
         ent([subjects], 1, [1], [])).
```

```
view(exams, 1).


att(exams, [name]).
att(exams, [speciality]).
att(exams, [course]).
att(exams, [subject]).
att(exams, [date]).
att(exams, [address]).


ent(exams, ent([lecturer], 1, 1)).
ent(exams, ent([subject], 1, 1)).
ent(exams, ent([exam], 1, 1)).
ent(exams, ent(['external examiner'], 1, 1)).


ent_att(exams, ent([lecturer], 1),
          att_det([name], [], key, 1)).

ent_att(exams, ent([lecturer], 1),
          att_det([speciality], [], key, 1)).

ent_att(exams, ent([subject], 1),
          att_det([course], [], key, 1)).

ent_att(exams, ent([subject], 1),
          att_det([name], [], key, 1)).

ent_att(exams, ent([exam], 1),
          att_det([subject], [], key, 1)).

ent_att(exams, ent([exam], 1),
          att_det([course], [], key, 1)).

ent_att(exams, ent([exam], 1),
          att_det([date], [], notkey, 1)).

ent_att(exams, ent(['external examiner'], 1),
          att_det([name], [], key, 1)).

ent_att(exams, ent(['external examiner'], 1),
          att_det([address], [], key, 1)).


rel(exams, rel([teaches], 1, 1)).
rel(exams, rel([prepares], 1, 1)).
rel(exams, rel([marks], 1, 1)).
rel(exams, rel([marks], 2, 1)).


ent_rel(exams,
          ent([lecturer], 1, [many], []),
                  rel([teaches], 1),
          ent([subject], 1, [many], [])).

ent_rel(exams,
          ent([lecturer], 1, [1, many], []),
                  rel([prepares], 1),
          ent([exam], 1, [1, many], [])).

ent_rel(exams,
          ent([lecturer], 1, [many], []),
                  rel([marks], 1),
          ent([exam], 1, [many], [])).

ent_rel(exams,
          ent(['external examiner'], 1, [1], []),
                  rel([marks], 2),
          ent([exam], 1, [many], [])).
```