

CSIT115/CSIT815 Database Management and Security

Laboratory 3

Scope

This laboratory includes the tasks related to logical modelling and relational data model.

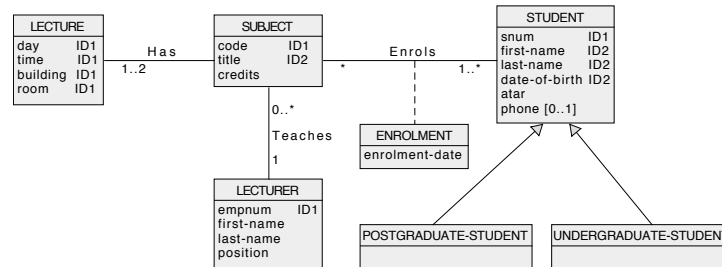
This laboratory consists of 2 tasks and specification of each task starts from a new page.

It is strongly recommended to solve the problems included in this specification **before coming to a laboratory class** and bring the preliminary solutions to a laboratory class such that any doubts, question, problems, etc can be discussed with a tutor in a laboratory class. Such procedure allows for more effective use of time spent in a supervised laboratory class.

Tasks

Task1 (1 mark)

Consider a conceptual schema given below.



Your task is to perform a step of logical database design, i.e. to transform a conceptual schema given above into a collection of relational schemas.

For each relational schema created clearly list the names of attributes, primary key, candidate keys (if any), and foreign keys (if any). Assume, that **superset method** must be used to implement a generalization. A way how a conceptual schema can be transformed into a collection of relational schemas is explained in a presentation 06 Logical Design.

The relational schemas must be listed in a format presented in the slides 43-44 in a presentation 06 Logical Design.

Deliverables

A file `solution1.pdf` with a list of relational schemas, primary key for each relational schema, candidate keys (if any) for each relational schema, foreign keys (if any) for each relational schema

Task 2(1 mark)

Consider the following collection of relational schemas.

EMPLOYEE(enum, first-name, last-name, salary)
primary key = (enum)

DRIVER(enum, license, category, experience)
primary key = (license)
candidate key = (enum)
foreign key = (enum) references EMPLOYEE(enum)

ADMIN(enum, position)
primary key = (enum)
foreign key = (enum) references EMPLOYEE(enum)

SKILL(sname)
primary key = (sname)

SPOSSESSED(enum, sname, level)
primary key = (enum, sname)
foreign key1 = (enum) references ADMIN(enum)
foreign key2 = (sname) references SKILL(sname)

TRUCK(rego, capacity, manufacturer, model)
primary key = (rego)

TRIP(origin, destination, license, rego, tdate)
primary key = (license, rego, tdate)
foreign key1 = (license) references DRIVER(license)
foreign key2 = (rego) references TRUCK(rego)

TRIPLEG(license, rego, tdate, leg-number, time-spent)
primary key = (license, rego, tdate, legnumber)
Foreign key = (license, rego, tdate) references
TRIP(license, rego, tdate)

Your task is to perform *reverse database engineering*, i.e. to find a conceptual schema of a database that has a collection of relational schemas given above. Use UMLetLet to draw a conceptual schema found and save your design in a file `solution2.pdf` (you have to Export your design under UMLetLet).

Deliverables

A file `solution2.pdf` with the *reverse engineered* conceptual schema.

End of specification