

CSCI235/MCS9235 Databases
Assignment 1 (4 marks)
Due on Saturday, 26 March 2016 at 11:55 pm

Scope

Preparation of this assignment requires implementation of the conceptual modeling tasks included in laboratory 1 and implementation of the experiments included in laboratory of week 2.

Objectives

The objective of this assignment is:

- to design a conceptual database schema (OMT diagram) from a given specification of database domain.
- to retranslate a conceptual schema into a collection of relational schemas.

Task 1 Design and diagrams (3 marks)

Read the description of a sample database domain given below.

Consider the following information about a university database:

- Every faculty staff has a staff number, a name, date of birth, level of position, work in department.
- Each project has a project number, a sponsor name (e.g., ARC, URC), a starting date, an ending date, and a budget.
- Each student has a student number, a name, date of birth, and a degree program (e.g., BCs, or MCs or PhD).
- Each project is managed by one faculty staff.
- Each project is worked by one or more faculty staffs.
- Staffs can work on multiple projects.
- Each project is worked on by one or more students (as the project's research assistants).
- When students work on a project, a staff must supervise their work on the project. Students can work on multiple projects, in which case they will have a supervisor for each one.
- Departments have department name, a main office, header of the department.
- Faculty staffs work in one or more departments, and for each department that they work in, a time percentage is associated with their job.
- Students have one major department in which they are working on their degree.

It is forbidden to add any additional attributes to the specification given above.

Use a notation of simplified OMT classes explained to you during the lecture classes to design a conceptual schema of a database domain described above. Apply a conceptual modelling methodology explained to you in a presentation *Conceptual modelling*. You have "read through" the specification given above several times and in the first "pass" identify the classes of objects, in the second "pass" identify associations and association classes, in the third "pass" identify attributes and link attributes, in the fourth "pass" find identifiers, in the fifth pass find qualifications of associations and finally, in the last "pass" find the generalization hierarchies (see presentation 3 *Conceptual modelling*, slide 3).

Task 2 Implementation of conceptual schema (1 mark)

Implement the conceptual schema obtained in the previous step using collection of relational schemas, i.e. a script with SQL statements CREATE TABLE and ALTER TABLE. Execute the script.

Deliverables

Submit an **archive file assignment1.zip** contains the following two tasks' files on Moodle.

Task 1

A soft copy of the design process and OMT diagrams in a PDF file **task1.pdf**.

A complete soft copy of description of design process together with a drawing of a conceptual schema in a notation of simplified OMT classes must be shown. You can find a sample format of a description in the solutions of *example*.

Note that delivery of a conceptual schema without a complete description of the design process will result in no marks being awarded for the assessment task!

A diagram of conceptual schema must be consistent with a graphical notation explained to you during the lecture classes. No other notation will be accepted. Any electronic drawing tools are acceptable.

Task2

A soft copy of a text file **task2.txt** contains execution of the relational schemas (SQL statement scripts and feedbacks).

Before execute the SQL scripts, you must run sqlplus, then use the following statements to generate output results into a text file.

```
SET ECHO ON
SPOOL task2.txt
@your-scripts-file-name
SPOOL OFF
```

Note that delivery of relational schemas without execution will result in no marks being awarded for the assignment task!

Submissions

This assignment is due by 11.55 pm (sharp) on Saturday, 26 March 2016.

This Assignment is to be submitted on Moodle.

Submit the file through Moodle in the following way:

- (1) Connect to Moodle.
- (2) Navigate to a folder SUBMISSIONS→ASSIGNMENT SUBMISSIONS
- (3) Click at Assignment 1, Submit your solution here link.
- (4) Click at Add Attachments button.
- (5) Navigate to a location where a file **assignment1.zip** has been saved.
- (6) Select the file and click at Open button.
- (7) Click at Submit button.
- (8) Click at OK button to return to Home Page.

A policy regarding late submissions is included in the course outline.

Only one submission of the first assignment is allowed.

The assignment must be submitted as **soft copy** only.

The first assignment is an **individual assignment** and it is expected that all its tasks will be solved **individually without any cooperation** with the other students. If you have any doubts, questions, etc. please consult your lecturer or tutor during lab classes or office hours. Plagiarism will result in a **FAIL** grade being recorded for that assessment task.

Late submissions do not have to be requested. Late submissions will be allowed for a few days after close of scheduled submission (up to 3 days). Late submissions attract a mark penalty; this penalty may be waived if an appropriate request for academic consideration (for medical or similar problem) is made via the university SOLS system *before* the Due date. No work can be submitted after the late submission time.

Marks and comments on the assignments will be returned to the students in two weeks after the submission on Moodle.

End of specification