

Concordia University
Dept. of Computer Science and Software Engineering
COMP 353–Databases
Main Project

Project reports and artifacts: April 10th before noon
Project Demos: April 11 and April 16, 2018

Your team is required to design a relational database application system, called COMPANY, for a “realistic” situation, and implement it using the MySQL database management system managed by AITS. The application is a two-tier, web-based system that connects the user(s) via Internet Explorer (IE) or any other standard web browser to the DBMS, using PHP. The system is expected to support “representative” queries and transactions, and produce desired reports. Each member of your team is responsible for the entire project and at least for a well defined portion of the project, agreed on by the team members.

IMPORTANT: The project must be complete and functional. The project report (in PDF format) as well as the artifacts (in a single zip file) must be submitted via Moodle before noon on April 11. The project demos will be during the lab sessions on Wed. April 11th and Mon. 16th. A schedule of available time slots (20 minutes each) for the demos will be posted in early April and assigned on a first-come-first-served basis.

Project Description

The COMPANY database records and keeps track of a company’s employees, departments, and projects. After the requirements collection and analysis phase, suppose that the designers (you and your team) are convinced that among other concepts, your database should represent the following information. The company has departments, each having a unique name, unique number, and a specific employee who manages it. We would like to keep track of the start date of each department manager. A department may have several locations. A department is in charge of a number of projects, each of which has a unique name, a unique ID, and a single location assigned to each project. The database should at least record the following information about each employee: name, birthdate, social insurance number (SIN), address, home or cell phone number, salary and gender. Each employee is assigned to one department but he/she may work on different projects in the company, not necessarily assigned to the employee’s department. We would like to keep track of the hours an employee worked on each project as well as the direct supervisor of each employee (who is another employee). For insurance and benefits reasons, the database should also record and keep track of information about employees’ dependents. Such information should include, for instance, name, gender, data of birth, SIN number. As the company grows, keeping track of different project’s phases and progress becomes more difficult without a data management application system. You are encouraged to consider other concepts that may be relevant and useful to this application and include them in your running system. Present your design in an E/R diagram and underline the key attributes. Convert your database conceptual design (the E/R) into relations and analyse

the relations which you decide to keep to support the application based on the FDs on each relation. Normalize the relations into BCNF (or 3NF) and present your final database scheme, with non-trivial FDs on each relation, and the key attributes. Express constraints that exists in each table or among different tables. To be more precise, your report should include the steps followed during the design process and implementation details, reiterated as follows.

What you should hand in:

1. Present the conceptual design of your database in the form of an E/R diagram, which should clearly show the required entity sets and relationships. It also indicates the key attributes as well as the multiplicity of the relationships. The design should be as compact as possible but should support the requirements. Make sure to clearly state any reasonable assumptions you might have made which were not mentioned the description above.
2. Convert your E/R diagram into a relational database schema. Make necessary refinements to the schema, if possible. Identify various integrity constraints such as primary keys, foreign keys, functional dependencies, and referential constraints. Make sure that your database schema is at least in 3NF.

Provide implementation details of your database system in MySQL with a suitable user interfaces. Populate your tables with “enough” data to show various functionalities of your system (10 to 20 tuples per table on average).

A working version of the project should be presented before the lab instructors during your demo time for which every member of the team **MUST** be present.

In addition to submitting through moodle the project report (in pdf format) and the artifacts (as a single zip file) in the due time mentioned at the beginning of this document, you also need to submit a hard copy of your project report at the DEMO time. It is important that your report include a section called “Contributions”, which describes the contribution of each member to the project in different activities and tasks involved in the development of the project. The lab assistants will also assess and note contributions of each member during the demos.

Note: The source code of the system that you will present at the demo time should be submitted through Moodle as a SINGLE zip file by April 10th at noon. Your project reports (about 12 pages) is also due on April 10th at 12:00 through moodle. On the cover page of the report, please write the *official names* of the team members and student IDs. If you use any resources that can further help enrich your project, it is fine to use it/them, however it is absolutely importat that your report includes proper citation and acknowledgements.