

EBU5602 Database Coursework Specifications

Teams

This coursework is to be done in groups of 6 students.

Statement

Design and implement a relational database for The EasyDrive School (descriptions of the system can be found at the end of the document).

Tasks

This includes setting up a database schema and providing access methods to this in the form of queries. The **steps for doing this include:**

- Creating a conceptual schema in the form of an ER diagram.
- Deriving a relational schema from the ER diagram.
- Validating the relations using normalization technique.
- Implementing this schema using SQL.
- Populating the database with a set of typical data. The data should be significant but manageable.
- Creating a set of SQL queries and query results, based on your database. (Note: your queries should involve all of your relations.)

Deliverables

Submission by midnight Tuesday, 2nd June 2020

Each group should submit **a report containing (one report by one group member per group** on QMPlus):

- **Description** of all assumptions you have made in your design (You can also add more requirements here). (2 mark)
- A conceptual schema (ER diagram) (with **explanation of how the database design supports the requirements**). (3 mark)
- The relational database schema for your database. You should also identify all primary and foreign keys in your design. You should *validate* your relations using normalization, and explain why they are in 4th Normal Form. (2 marks)
- The sample test data. This test data should be carefully designed in order to test that your queries will work under any conditions. (1 marks)

- A set of **SQL queries** for sample queries (listed in Sample Queries), with **query results** of the output you obtain when you run these queries. (2 marks)

Each group should **also submit a zip file containing your EER design (.mwb file) and a database (.sql file)** (see <https://dev.mysql.com/doc/workbench/en/wb-admin-export-import-management.html> for **exporting database**. Note: choose “Export to self-contained file” option).

Assessment

The total coursework counts for 10% of the final mark of the module.

The EasyDrive School Case Study

The EasyDrive School was established in Glasgow in 1992. Since then, the School has grown steadily and now has several offices in most of the main cities of Scotland. However, the School is now so large that more and more administrative staffs are being employed to cope with the ever-increasing amount of paperwork. Furthermore, the communication and sharing of information between offices, even in the same city, is poor. The Director of the School, Dave MacLeod, feels that too many mistakes are being made and that the success of the School will be short-lived if he does not do something to remedy the situation. He knows that a database could help in part to solve the problem and has approached you and your team to help in creating a database system to support the running of the *EasyDrive School*. The Director has provided the following brief description of how the *EasyDrive School* operates.

Data Requirements

Each office has a Manager (who tends to also be a Senior Instructor), several Senior Instructors, Instructors, and administrative staff. The Manager is responsible for the day-to-day running of the office. Clients must first register at an office and this requires that they complete an application form, which records their personal details. Before the first lesson, a client is requested to attend an interview with an Instructor to assess the needs of the client and to ensure that the client holds a valid provisional driving license. A client is free to ask or a particular Instructor or to request that an Instructor be changed at any stage throughout the process of learning to drive. After the interview, the first lesson is booked. A client may request individual lessons or book a block of lessons for a reduced fee. An individual lesson is for one hour, which begins and ends at the office. A lesson is with a particular Instructor in a particular car at a given time. Lessons can start as early as 8am and as late as 8pm. After each lesson, the Instructor records the progress made by the client and notes the mileage used during the lesson. The School has a pool of cars, which are adapted for the purposes of teaching. Each Instructor is allocated to a particular car. As well as teaching, the

Instructors are free to use the cars for personal use. The cars are inspected at regular intervals for faults. Once ready, a client applies for a driving test date.

To obtain a full driving license the client must pass both the practical and theoretical parts of the test. It is the responsibility of the Instructor to ensure that the client is best prepared for all parts of the test. The Instructor is not responsible for testing the client and is not in the car during the test but should be available to drop off and pick up the client before and after the test at the Testing Centre. If a client fails to pass, the Instructor must record the reasons for the failure.

Query Transactions (Sample)

The Director has provided some examples of typical queries that the database system for the EasyDrive School must support.

- (a) The names and the telephone numbers of the Managers of each office.
- (b) The full address of all offices in Glasgow.
- (c) The names of all female Instructors based in the Glasgow, Bearsden office.
- (d) The total number of staff at each office.
- (e) The total number of clients (past and present) in each city.
- (f) The timetable of appointments for a given Instructor next week.
- (g) The details of interviews conducted by a given Instructor.
- (h) The total number of female and male clients (past and present) in the Glasgow, Bearsden office.
- (i) The numbers and name of staff who are Instructors and over 55 years old.
- (j) The registration number of cars that have had no faults found.
- (k) The registration number of the cars used by Instructors at the Glasgow, Bearsden office.
- (l) The names of clients who passed the driving test in January 2000.
- (m) The names of clients who have sat the driving test more than three times and have still not passed.
- (n) The average number of miles driven during a one hour lesson.
- (o) The number of administrative staff located at each office.