COMP518 Assignment 3 (of 3): 25% of the final grade

Due: 17:00 on Thursday, December 8th

Please submit your solutions electronically (**only in a file of txt format**) in CANVAS.

The submission of your solutions should be in a **single plain text format (.TXT)** file. Make sure that you test that your **MySQL** code works in the version installed in the lab, because this is the version which is going to be used for the assessment. You may copy and paste your solutions in MySQL in your labs to be sure that everything works properly.

Learning outcomes:

1. Design and implement database systems.
2. Develop the ability to use SQL as a data definition and data manipulation language, and to develop a critical understanding of querying a relational database with SQL.

Assessment's purpose:

1. Create a relational database and express queries to a relational database by using SQL.

Failure in the assessment may be compensated for by higher marks in other components of the module. Marking of subquestions will be based on the marking descriptors of the University's Code of Practice on Assessment.

Standard UoL penalty applies for late submission in accordance with the Universitys Code of Practice on Assessment. The **last possible date of submission is at 14:00, on Tuesday, December 13th**, because a feedback will be given afterwards.

Please be aware of the University guidelines on **plagiarism and collusion**. Please be sure that you have read the following page related to **academic integrity** before you submit your solutions:
https://canvas.liverpool.ac.uk/courses/62776/pages/assessment-related-information.

Total: 100 marks

Question One (30 marks)

Consider the following relational database schema,

- Employee(eId, eName, age)
- Department(dId, dName, address)
- WorksIn(eId, dId, since)
- Product(pId, pName, pType, pColor)
- Sells(dId, pId, pStock, quantitySold);

Clarifications: eId, dId and pId are identification numbers of employee, department and product, respectively. WorksIn table shows in which department each employee works and since attribute shows the date when the employee started working in the department. Sells table shows which products each department sells, pStock attribute shows how many copies of a product are available in a department, and quantitySold attribute shows how many copies of a product have already been sold in a department.

Task. Create the above schemas in **MySQL**, using the **CREATE TABLE** statement. Make sure that you define all possible **keys**, and that **entity integrity** and **referential integrity** are guaranteed in a reasonable manner.

Question Two (70 marks)

For the above relational database schema provide **MySQL** queries for the following:

1. **(10 marks)** Find the names of departments which sell blue products.
2. **(10 marks)** Find the names of departments which sell products of type tool and products of type toy.
3. **(10 marks)** Find the names of departments where one can find all red products (i.e. all those products should be available in stock).
4. **(10 marks)** Find the ids of departments which sell blue products and do not have any employee older than 40.
5. **(10 marks)** For each department report the department-id and the age of the oldest employee working in it.
6. **(10 marks)** Find the names of employees who are older than at least one employee working in department 'Central'.
7. **(10 marks)** Find the names of employees working in departments which have sold at least 5 types of products.

Hint: A good idea would be to populate sample data into your database using MySQL. This will help you to verify that your MySQL queries are correct.