Assignment 1

Please make sure that you always use notations consistent with lecture notes. Different notations will not be accepted. The deadline for assignment 1 is:

Fri 9 Oct, 5:00 pm (Sydney time)

Question 1 (9 marks)

A multi-location software company hires you to design a small database with the following requirements:

- An employee is uniquely identified by his/her ID. For each employee, we also record his/her name, phone number and email. Each employee only works in a department and can have multiple available working periods.
- A department is uniquely identified by its DepartmentCode. For each department, the name, the description and the contact number will be recorded. The number of employees in a department is needed.
- A project is uniquely identified by its ProjectCode. For each project, the name, the estimated cost, and the description will be recorded.
- A project must have at least one employee assigned to work on it, but an employee may work on zero or more projects.
- A department can host more than one project; a project is hosted by one or more departments. Whenever a department hosts a project, the time should also be recorded.
- Location can be identified by LocationID and has the attributes of Address and StartTime. The Address is composed of a suburb and a street.
- There can be zero or more departments at the same location, and a department has only one location.
- Each technological device is uniquely identified by its DeviceID. All the devices are allocated to the departments, and a device can only be allocated to one department. Each department has zero or more devices. For each device, we also record its price.
- Each employee uses exactly one technological device, and a device can be used by zero or one employee.

Draw an ER diagram to represent the scenario, clearly state the assumptions you make if any.

Question 2 (6 marks)

Convert your ER-diagram from Question 1 into a relational data model.

Question 3 (10 marks)

Consider the following relational schemas:

Movie (mID, mTitle, time)

Genre (mID, genre)

Actor (aID, aName, gender)

Cast (aID, mID)

Director (dID, dName, gender)

Direction (dID, mID)

Write relational algebra expression to answer the following questions:

1) Find the ***titles*** of the movies directed by ***James Cameron***. (2 marks)
2) Find the ***names*** of the actors who have acted in at least ***4*** movies. (2 marks)
3) Find the ***titles*** of the cross-genre movies which are both ***comedy*** and ***drama***, but ***Jim Carrey*** is not in the cast list. (3 marks)
4) Find the ***names*** of the ***female*** directors who only directed ***long movies*** (>=2hrs) but have never directed any movies with more than ***10*** actors. (3 marks)

Note that, only the operators in the lecture slides can be used in your answer. Any attribute other than the primary key is not unique, such as the title of the movies and the name of the actors and the directors. The movie time is saved as number in minutes, such as 2hrs will be saved as 120.

Assignment Submission

- Students must submit an electronic copy of their answers to the above questions to the course website via Turnitin. (In Moodle)
- Only **.doc** or **.pdf** file is accepted. The file name should be ass1_**studentID**.doc or ass1_**studentID**.pdf (e.g., **ass1_z5100000.doc** or **ass1_z5100000.pdf**).

Note:

1. For any problems in submissions, please email to comp9311unsw@gmail.com
2. All submissions will be checked for plagiarism.
3. We do not accept e-mail submissions.

The university regards plagiarism as a form of academic misconduct and has very strict rules regarding plagiarism. For UNSW policies, penalties, and information to help avoid plagiarism, please see: https://student.unsw.edu.au/plagiarism as well as the guidelines in the online ELISE tutorials for all new UNSW students: https://subjectguides.library.unsw.edu.au/elise

Late Submission Penalty

20% of the value of the submission will be deducted for each day (24 hours). Submissions with more than five days late will not be marked.