

# CMPT 354 - Database Systems I

## Assignment 1

Due date: Oct 5, 2015  
20 marks, 10% of grade

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**Important Note:** Students must work individually on this, and other CMPT 354, assignments. You may not discuss the specific questions in this assignment, nor their solutions with any other student. You may not provide or use any solution, in whole or in part, to or by another student.

You are encouraged to discuss the general concepts involved in the questions in the context of completely different problems. If you are in doubt as to what constitutes acceptable discussion, please ask!

1. (8 marks) Consider the following schema:

*Manufacturer(MName, HQAddress, Country)*

*Car(ModelName, ModelNum, MName, Kind)*

*Dealership(DName, DCity)*

*Sell(DName, ModelName, ModelNum, Price)*

*SalesPerson(SId, SName, DealerName)*

Use the Relational Algebra to express the following queries:

- (a) Find the model names of all cars manufactured by Mercedes.
  - (b) Find the names and addresses of all dealers who sell Toyotas (i.e., cars with make Toyota.)
  - (c) Find the addresses of dealers that sell at least one type of car manufactured by a company based in Japan.
  - (d) Find all dealers who don't sell any car manufactured by Honda.
  - (e) Find the dealer in Burnaby that sells the cheapest Honda Civic.
  - (f) Find the names of those salespersons whose name is the model name of a car.
2. (8 marks) In this part you are to design a database schema for administering courses at SFU. This will involve storing information about students, courses, and course instructors. You are given the following information.
    - A student has a student number, first name, last name, year of study, and a GPA.
    - A course has a unique course number, title, and area of computer science.
    - Instructors have a staff id, first name and last name, and one or more areas of computer science that they can teach.
    - An area of computer science is given by its name.

- Courses are taught in course sections. A course section has a course associated with it, along with a section number, year, semester, instructor, a room, day of the week, and a start and end time. A course section may have 0, 1, or more TAs associated with it.
  - A TA is a student that has associated with him or her one or more areas of computer science that they are qualified to TA.
    - (a) Design an entity/relationship diagram for this application. Include all information that is relevant to the problem. Justify any decisions that you make and state any assumptions that you feel necessary.
    - (b) Convert your E/R diagram to a relational schema, including all relevant information. Again, please justify any decisions that you make and state any assumptions that you feel necessary.
3. (4 marks) Exercises 4.5.1 and 4.5.2 in the text (page 163).