CSC 370 - SUMMER 2020
DATABASE SYSTEMS
ASSIGNMENT 2
UNIVERSITY OF VICTORIA

Due: Thursday, June 4th, 2020 at **18:00 Victoria Time (PDT)**. **Late assignments will not be accepted.**

You may construct your answer electronically (e.g. with a diagramming tool) or on paper (scanned or photographed legibly for submission). You must use the E/R diagram format and conventions covered by our lectures and text books (answers using other conventions will receive a mark of zero). Answers must be well formatted and legible or they will not be marked.

Question 1: Medications [8 marks]

Databases in the field of healthcare can be extremely complicated, due to the large number of competing requirements and the need to maintain huge volumes of data for all aspects of patient care (such appointments, diagnoses, hospital visits, specialists, prescriptions, conditions, procedures, etc.). This question covers a data model for medications, which should enable such queries as 'find all medications (prescribed or otherwise) taken by a given patient', 'find all prescriptions written by a given doctor' or 'find all patients taking a given drug'. Construct an E/R diagram for the following data; ensure that all entities have associated primary keys. You may add surrogate keys, but you will lose marks if you add surrogate keys in cases where they are unnecessary.

- Patients have a provincial health number (PHN), which is unique, as well as a name and a home address.
- Doctors have a name, office address and unique ID number.
- Medications have a drug ID number (DIN), a chemical name and may have several trade names. For example, ibuprofen is sold under the trade names 'Advil' and 'Motrin'. Not all medications have a trade name.
- Some medications are classified as over-the-counter, which means that patients can buy them without a prescription. However, prescriptions can still be given for over-the-counter medications.
- A prescription is written by a single doctor for a single patient. Each prescription is for a single medication. The prescription has an associated date and dosing instructions (e.g. 'take twice daily'). Note that the dosing instructions for a given medication may differ between prescriptions.
- A patient may receive multiple prescriptions for the same medication over time. For our purposes, you may assume that they will receive no more than one prescription of a given drug per day.

Question 2: University Enrollment [8 marks]

Construct an E/R diagram for the university enrollment system described below, which is a less simplified model than the one we have used during lectures. In particular, your model should treat all members of the university (students and staff) as similar entities, congruent to the system used

at UVic. This question will be marked based on the correctness of the E/R diagram and the validity of any assumptions made while interpreting the requirements below. If you make any assumptions, you may want to write them down and submit them with your answer. Remember to include primary keys for each entity in the diagram. You may add surrogate keys, but you will lose marks if you add surrogate keys in cases where they are unnecessary.

- The model should contain entities for faculties (e.g. the Faculty of Engineering), departments (e.g. the Department of Computer Science), members (e.g. a student or staff member), courses (e.g. CSC 370) and course offerings (e.g. the Summer 2020 offering of CSC 370). Your solution may contain additional entities as necessary.
- Students and staff are all considered to be 'members' of the university. Each member has a unique ID number, a name, a netlink ID and a home address. It is possible for a particular member to be both a student and a staff member.
- A faculty (such as the Faculty of Engineering) has a name and a main office location. Each faculty has a dean, which will be a staff member.
- A department (such as the Department of Computer Science) has a name and a main office location, and is associated with exactly one faculty. Each department has a chair, which will be a staff member. A department must have exactly one chair.
- Each course has a name and a course code (which is unique across the university). Every course is also associated with exactly one department.
- A course offering has a term code (e.g. '201901') and section number (e.g. 'A01'). Each offering is associated with one particular course, but a course may have multiple associated offerings (even within the same term).
- Some members are students. Each student must be a member of a faculty. Students may also have declared a major (or two majors) with a department.
- Students may enroll in one or more course offerings. Each enrollment has an associated grade.
- Some members are staff members. Staff members must be employed by at least one department. Staff members may be the instructor for one or more course offerings.
- Courses may have multiple instructors, or no instructor at all (for cases where no instructor has been assigned yet).