**CS3431-A23: Project Phase 1**

**Initial Design and Implementation**

**Due Date:** T 9-26 at 11:59pm. **No late submissions because I need to release solutions so students can start**

**Project Phase 2.**

**Teams:** The project is done in the same teams of two as in Assignment 4.

**Submission:** Make sure to include both of your names on the project submission. The ERD and relational schema is to be submitted in either Word or PDF format. The SQL code should be in a p1.sql file. Zip both files, name it Project1.zip and upload a single submission to the Project 1 link. Make sure to coordinate who is uploading the file and have the other team member confirm it has been uploaded BEFORE the deadline.

**Description:**

In this phase you will be designing the ERD, the relational schema, and writing the SQL using Oracle SQL Developer or a similar IDE to create the database that software engineers will use to create a Fuller Labs application to manage the directory and create paths to destinations on the third floor. For this assignment you will implement the information for the entire directory as given in the accompanying Fuller Directory spreadsheet, and the directed path for just the third floor (see attached image). You will implement the directed graph from the third floor image containing blue dots (locations) and the red lines connecting them (edges). You will need to determine a logical naming scheme for hallway, elevator and staircase locations on the map. Write down the map coordinates for each of the dots.

The naming scheme (important for grading purposes) for the primary key constraints is

Tablename\_attributename(s)\_PK

The naming scheme for the foreign key constraints is

Tablename\_attributename(s)\_FK

If fields are unspecified variable length characters, use varchar2(40) as the SQL data type. For unspecified ID fields or number fields, use number(5).

Do not use the ALTER TABLE statement to create the primary and foreign key constraints.

If you use inheritance in your design, apply the ISA Method A2 (see Module M 9-18, PersonA2) when translating the ERD into a relational schema.

A copy of the CS Fuller Directory from many years ago, and the Fuller 3rd floor map with locations and edges is provided for your data entry. Note that the directory is NOT representative of what your tables should look like! Make sure to create your conceptual ERD and then translate it to a relational schema. You will need to modify the tables in the spreadsheet to match your relational schema before you create the tables and populate them with data.

The database includes the following:

1. A location has a unique id, a location name, a location type, x and y coordinates on a map image, and the floor it is on in Fuller Labs. The combination of x-coordinate, y-coordinate, and the floor is also unique. The possible values for the floors are 1, 2, 3, A, and B. B is the basement, and A is the sub-basement.
2. A computer science department staff employee has a unique account name, first name, last name, titles, and phone extensions. First and last names are non-null.
3. Computer science department staff can only be assigned to a single location that is an office. An office may have many computer science department staff. Consider the type of relationship between offices and locations that would permit this constraint to exist. An office only exists at a single location.
4. A hallway is a type of location and has a long name (description) associated with it.
5. A title has a unique acronym and a unique name. The title acronyms are used much more often in our database system than the title names.
6. An edge connects two adjacent locations with one another from a starting location to an ending location. Note that since it is directed, you will need to include both directions. In order words, you need to have an edge with (3H1, 3H2) and an edge with (3H2, 3H1). Do not worry about the other floors. Edges should be unique since no duplications should exist.
7. A path consists of an ordered list of locations from the starting location to the final location.

**Requirements:**

1. Design an ERD that captures the above requirements. Follow the notations given in the course slides, and also follow the given guidelines for Good Design.
2. State any assumptions that you make in addition to the above requirements.
3. Translate your ERD into a relational model for the above application. You need to follow the rules that convert the ERD to relational model.
4. A copy of the CS Fuller Directory from a past year, and the Fuller 3rd floor map with locations and edges is provided to you for data entry. Note that the directory is NOT representative of what your tables should look like! You will need to modify the tables in the spreadsheet to match your relational schema before you create the tables and populate them with data.
5. Write the SQL code in a file named p1.sql to
   1. Create the tables including the constraints.
   2. Enter the directory and floor plan data for the third floor.
   3. Enter data for just the following 3 paths:
      1. elevator E1 to room 320
      2. room 312 to room 319
      3. bottom stairs S2 to room 308