CS450 – Database Concepts

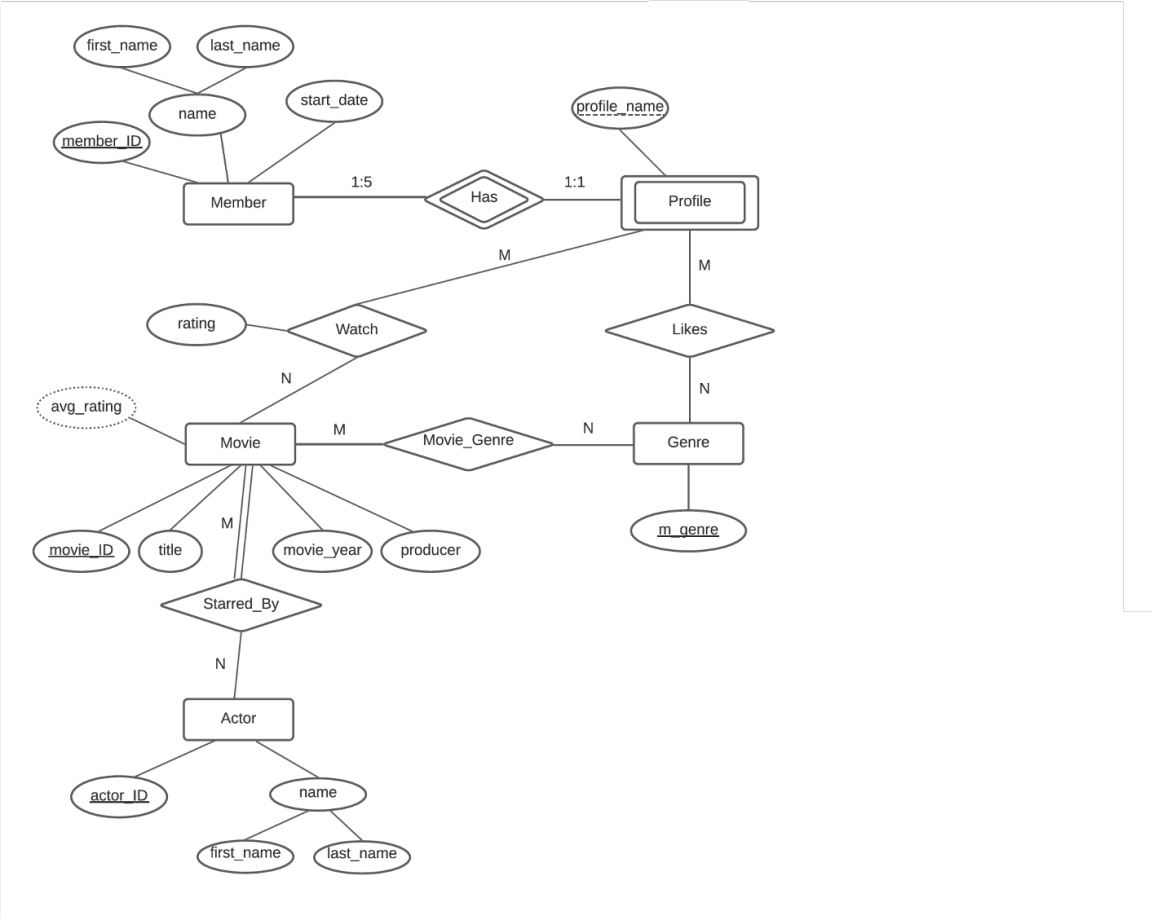
Fall 2021

Instructor: Dr. Jessica Lin

Homework 2 – Due 10/01 (Friday) at 11:59pm

*You may work in a team of two for this homework.

This problem concerns the ER diagram resulting from HW1. Please refer to HW1 for the requirements/constraints of the database. Please use the ER diagram provided here.



a) Convert the entity-relationship design to a schema for a relational database. List all relational schema. For each relational schema, state

(i) the name of the relation,
(ii) the names of its attributes,
(iii) the domain (or data type) of each attribute,
(iv) the primary key (by underline), and
(v) the foreign key(s).

Some example schemas are provided here. Follow the same format.

Department(dept_code: string, dept_name: string, dept_chair_SSN: string)
Foreign Key (dept_chair_SSN) references Instructor(SSN)

Instructor(SSN: string, name: string, dept: string, salary: real)
Foreign Key (dept) references Department(dept_code)

Student(SSN: string, name: string, dept: string, advisor_ssn: string, gpa: real)
Foreign Key (advisor_ssn) references Instructor(SSN)
Foreign Key (dept) references Department(dept_code)

b) Use Oracle on VSE LAB machine to create the tables from a) above and insert at least two tuples to each table (or more if needed). Implement all these in one script (plain text) file. Follow these steps:

1. Before you start, make sure you read this website on how to activate your account and access the Oracle server: https://labs.vse.gmu.edu/index.php/Services/Oracle. You will need to turn on VPN if you are not on campus.

2. Since the TA will run your script from his/her own account, we need to make sure that the tables that your script is about to create do not already exist in the account (i.e. those created by running students' scripts). **Please start your script with a list of "drop table" statements with cascade constraint**, e.g.

   ```
   drop table Department cascade constraint;
   drop table Instructor cascade constraint;
   drop table Student cascade constraint;
   ```

   This is also helpful when you run/test your own script.

3. At the end of the script, please add a list of "select" statements to print the content of all your tables, e.g.

   ```
   select * from Department;
   select * from Instructor;
   select * from Student;
   ```

4. Run the script and save the script output to a file.

Submission instruction:

What/when/how to submit: Submit three files: (a) PDF file for the schemas; (b) plain text file for SQL script (extension .sql), and (c) PDF file for the output. Submit on Gradescope.

Please follow the guidelines below. Any violations might cause you to lose points.

1. Prepare your submission:

Create a script file by putting all the commands (SQL statements, no sqlplus prompts and outputs) in **ONE** file, then run it on either SQLDeveloper GUI or command line. Save the script file in text format. Note that text file means **only ASCII code is allowed**. If you use Word, make sure you save the file in ASCII format otherwise you might get errors on your script. No other formats are acceptable. The script file should have .sql as extension. No .txt otherwise your script will not run.

Before you submit, please run your script file to make sure it is executable. **Un-executable script files will receive zero for part(b)!**

2. Format of your .sql file:

As the first few lines of the text file, put your **name(s)**, the **assignment number**, and your **email address** in these few lines.
Be sure to add comment symbol (--) before them.

Here is an example:

```
-- Student: John Smith
-- Assignment #1
-- Instructor  – Dr. Jessica Lin
-- Email: jsmith@gmu.edu
```

3. Where to submit:

Log in to Blackboard, select the course page, and click on "Gradescope" on the left panel. You will find HW2 there. **Submission via email is not acceptable.**

Some Tips:

Oracle DBMS:

1. If you have troubles creating a table, try to clean up your database. Proceed as follows:

```
select table_name
from all_tables
```

where owner='YOURACCOUNTNAMEINUPPERCASE';

to see what tables you have in your database. Then use

drop table table_name;

to delete them in sqlplus.

2. If you still have troubles creating a particular table, try a different name. A name (like order, group, user, etc) may be a reserved word. Here is a list of reserved words for Oracle:
https://docs.oracle.com/cd/B19306_01/em.102/b40103/app_oracle_reserved_words.htm

3. When creating tables that contain foreign keys, make sure the tables that are referenced have already been created.

4. Foreign keys should only reference the primary key (or attributes with UNIQUE constraint) of another table.

5. If you're using the command line (sqlplus), go to the directory where you have the script, then type sqlplus. Say my script is named "JLin.sql." To run the script, at the prompt, type

start test

or

@test