CS/DSA 4513 – Section 001 - Fall 2021 - Dr. Le Gruenwald

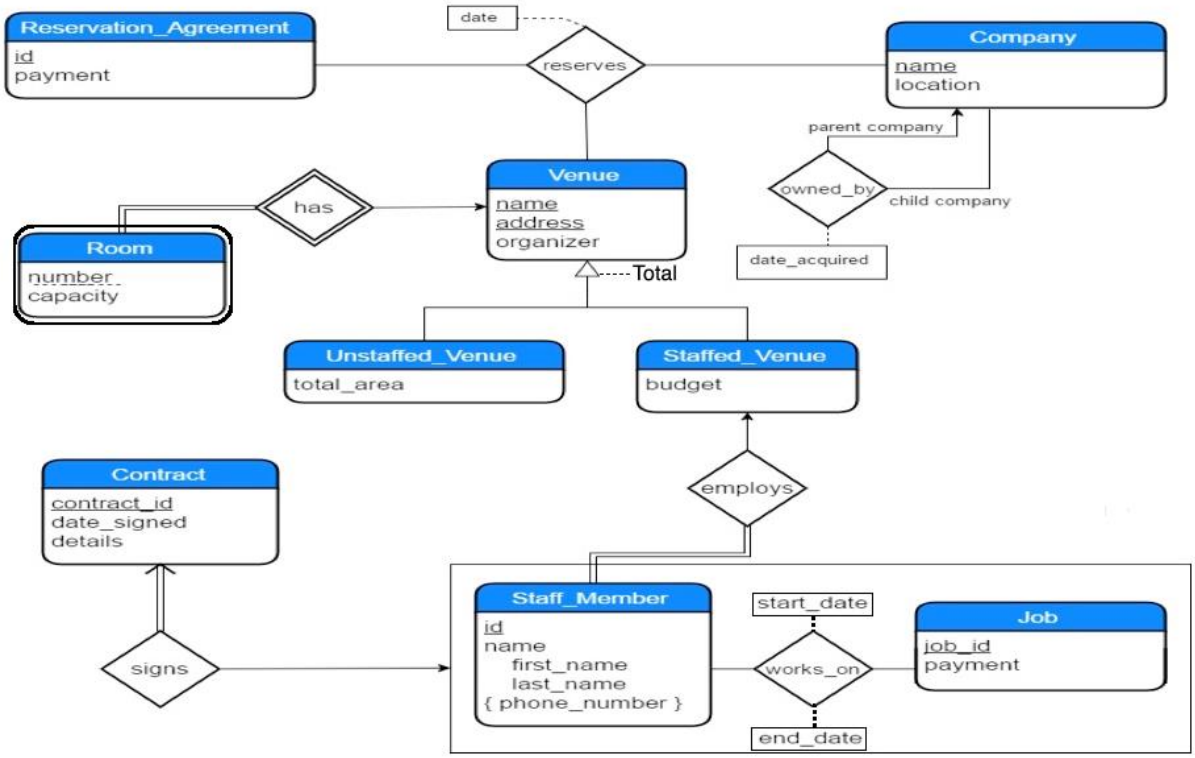
GRADED HOMEWORK 2 (Maximum Points: 100 points)

Assigned: 9/22/2021
Group Portion Due: 10/4/2021 at 01:30 PM on Canvas
Individual Portion Due: 10/5/2021 at 11:59 PM on Canvas
No late submission of either the group portion or the individual portion will be accepted.
See the submission instructions at the end of the document. Read the "Group Graded Homework Grading Policy" posted on Canvas

Problem 1:

Group Questions:
You do not need Azure SQL Database for this problem. Do the following:

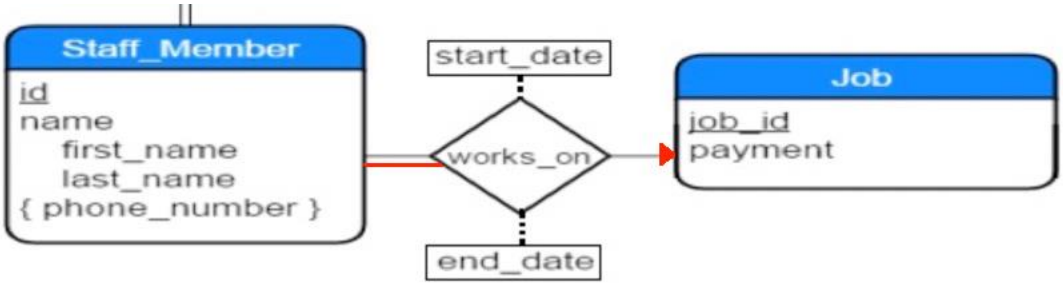
a) Write a description for the attached ER diagram.
b) Convert the attached ER diagram to a Relational Database.
c) Draw a Schema Diagram for the relational database.



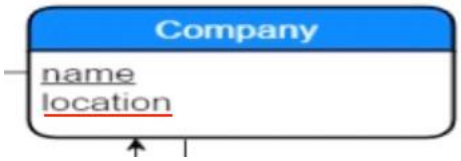
Individual Questions:
Each group member can be assigned one of the following questions randomly after the group portion of the homework is due (see the submission instructions at the end of the document). You must be ready to answer any of these questions on your own to submit the individual portion of the homework:

1) Consider the below ER diagram fragment which changes the Problem 1 ER diagram. Does this change (works_on is now a one-to-many relationship set with total participation of Staff_Member

entities) impact your answers to Problem 1 group questions (a), (b), and (c)? If it does, provide the corresponding updates to your answers to those questions (providing a detailed write-up of the updates is OK). If it does not, provide the detailed explanations of your reasons.



2) Consider the below ER diagram fragment which changes the Problem 1 ER diagram. Does this change (the location attribute is now a part of the primary key of the Company entity set) impact your answers to Problem 1 group questions (a), (b), and (c)? If it does, provide the corresponding updates to your answers to those questions (providing a detailed write-up of the updates is OK). If it does not, provide the detailed explanations of your reasons.



Problem 2:

Group Questions:
Given a relational database that consists of the following relations:

Performer (pid: integer, pname: string, years_of_experience: integer, age: integer)
Movie (mname: string, genre: string, minutes: integer, release_year: integer, did: integer)
Acted (pid: integer, mname: string)
Director (did: integer, dname: string, earnings: real)

Do the following using Azure SQL Database:
a) Use SQL statements to create the relations.
b) Populate the relations using SQL statements with the given data posted on Canvas.
c) Implement the SQL queries for the following:

1. Display all the data you store in the database to verify that you have populated the relations correctly.
2. Find the names of all Action movies.
3. For each genre, display the genre and the average length (minutes) of movies for that genre.
4. Find the names of all performers with at least 20 years of experience who have acted in a movie directed by Black.
5. Find the age of the oldest performer who is either named “Hanks” or has acted in a movie named “The Departed”.
6. Find the names of all movies that are either a Comedy or have had more than one performer act in them.
7. Find the names and pid's of all performers who have acted in at least two movies that have the same genre.

8. Decrease the earnings of all directors who directed "Up" by 10%.
9. Delete all movies released in the 70's and 80's (1970 <= release_year <= 1989).

You will need to create an SQL file to store your SQL statements. This SQL file must have *sql* as its extension. You must also use Azure Portal or Azure Data Studio to collect **cropped screenshots** of your query outputs and compile them into a single PDF file.

Individual Questions:
Each group member can be assigned one of the following questions randomly after the group portion of the homework is due (see the submission instructions at the end of the document). You must be ready to answer any of these questions on your own to submit the individual portion of the homework:

1) Consider the below update to the Movie schema from the relational database given in Problem 2:
   - Movie (mname: string, genre: string, minutes: integer, release_year: integer, did: integer, **imdb_rating: real**)

   How does this change (the addition of the IMDB rating attribute to the Movie schema) impact your group answer to the group question (a) of Problem 2? Provide new/updated SQL statements (no Azure SQL execution is needed) which reflect the changes to your group answer for that question.

   Now consider the additional query for the group question (c) of Problem 2:
   - **Find the names of all directors who directed the movies with the IMDB rating above 9.0.**

   Provide the SQL statement (no Azure SQL execution is needed) corresponding to the new query.

2) Consider the below addition to the relational database given in Problem 2:
   - **Movie_Award (aname: string, type: string, year: integer, mname: string)**

   How does this change (the addition of the new Movie_Award schema) impact your group answers to the group question (a) of Problem 2? Provide new/updated SQL statements (no Azure SQL execution is needed) which reflect the changes to your group answer for that question.

   Now consider additional query for group question (c) of Problem 2:
   - **Find the names of all movies which received "Best Cinematography" Oscar awards from year 2000 to 2010 (inclusive).**

   Provide the SQL statement (no Azure SQL execution is needed) corresponding to the new query.

SUBMISSION INSTRUCTIONS:

Group Portion:

- All your text and graphics solutions must be generated using computer. No hand-written descriptions or hand-drawn diagrams will be accepted.

- Submit your solutions for Problem 1 in ONE single PDF file to Canvas using the file name convention HW2_Problem1_Group X where X is your group number.

- Submit your solutions for Problem 2 in TWO files: one SQL file (extension *sql*) containing all your DDL and DML SQL statements and one PDF file (extension *pdf*) containing the execution

results of your SQL statements. Use the file name convention HW2_Problem2_Group X where X is your group number. We will be using your submitted SQL files to test your solutions.

- Attach to your PDF for Problem 1 a cover page that contains the following information:

  COURSE: CS/DSA-4513 - DATABASE MANAGEMENT
  SECTION: 001
  SEMESTER: FALL 2021
  INSTRUCTOR:
  GROUP NUMBER: <write your group number here>
  GROUP MEMBERS: <list the names of all members here>
  SCORE: <<we will record the total score of your group for both problems 1 and 2 here>>

Individual Portion:

- After the submission deadline of the group portion of this graded homework, and before the submission deadline of the individual portion of this graded homework, you will have to take a quiz on Canvas. The quiz will be open from 2:46 PM, Monday, October 4, 2021 to 11:59 PM, Tuesday, October 5, 2021. The quiz will contain either one of the Individual Questions for Problem 1 or one of the Individual Questions for Problem 2. Once you open the quiz, you will have 60 minutes to submit your answer. Only one attempt is allowed. You will have to upload one PDF document as your answer. The quiz will also ask you for your feedback on your group members (i.e. the scores you give to each of your group members on the group portion of this graded homework) as outlined in the "Group Graded Homework Grading Policy" document available on Canvas.

NOTES:

- Instructions for setting up Azure SQL Database are available on Canvas.
- If you have questions concerning this homework or Azure SQL Database, see your TAs during their office hours or email them. The TAs' office hours and contact information are on the Home Page on Canvas.
- Start this project early to avoid last-minute system problems.