CS 432: Databases

Assignment 1: DESIGNING THE DBMS

Total marks: **100M (40+40+20)**	**Submission deadline: 23:59:59 Hrs, 29th January 2023**

1. Assignment Instructions

Please refer to the following assignment instructions:

1. Regarding the late submission, we will be following the penalty as per the table:

Late Submission	Penalty (Out of 100)
Till 1-hour past deadline	5 points
1 to 12 hours past deadline	10 points
12 to 24 hours past deadline	20 points
24 to 36 hours past deadline	40 points
36+ hours past deadline	100 points

2. No assignment-related queries will be answered after Jan 28, 2023, 23:59:59.
3. We will follow the zero plagiarism policy, and any act of plagiarism will result in a zero for the assignment.
4. Please cite and mention others' work and give credit wherever possible.
5. If you seek help and discuss it with the stakeholders or individuals, please ask for their permission to mention it in the report/submission.

2. Problem Statement & Requirements

1. G1 and G2 have to come up with a system for which they have to design a relational database. The topic per group is already assigned (here).
2. The design should have the following:
    a. Entities and their attributes.
    b. Relationships and their attributes, if any.
    c. At least one primary key and one foreign key.
    d. At least one one-to-one relationship.
    e. At least any/both of (one-to-many, many-to-one) relationships.
    f. At least one many-to-many relationship.
    g. At least one of each (total & partial) participation constraint.

3. Tasks

3.1 Responsibility of G1: 40 Pts.

Write a description of the database system in detail.

1. What is your database for, what will be its impact, who are the stakeholders involved, and what is the significance of your database? Along with these, any other information which is necessary for your database should be mentioned in the description.
   [Novelity in your database brings you more points] **(10 x 1 = 10 Pts.)**

2. The description should satisfy all the requirements as mentioned in Design Requirements. **(5 x 1 = 5 Pts.)**
3. Mention the questions that you asked from the respective stakeholders or individuals. **(5 x 1 = 5 Pts.)**

Answer the following questions:

1. Name all the entities, relationships, and attributes involved in your system. **(4 x 1 = 4 Pts.)**
2. Give justification for each of the relationships (Points c to g in Design Requirements). **(4 x 4 =16 Pts.)**

The description of the database should be under 500 words.

3.2 Responsibility of G2: 40Pts.

1. Convert your ER Diagram into Relational tables. **(20 x 1 = 20Pts.)**
2. Your design should contain candidate keys and primary keys for the schemas. **(1.5 x 2 = 3 Pts)**
3. The constraints that your schema has as key constraints (such as PRIMARY KEY, FOREIGN KEY, NOT NULL, UNIQUE, DEFAULT & CHECK) all should be listed and explained: "Why it is needed." **(6 x 2 = 12 Pts)**
4. Your design should contain all the mapping cardinalities. **(5 x 1 = 5 Pts.)**

3.3 Responsibility of G1 & G2: 20Pts

Draw an ER diagram for your system using any of the drawing software online or offline. You may use **draw.io**. Please follow the notations discussed in the classroom lectures

4. Submission

1. The submission file (final PDF) will have four sections:
   a. Responsibility of G1 (Answers to the above questions).
   b. Responsibility of G2 (Answers to the above questions).
   c. Responsibility for both G1 and G2 (ER Diagram or link to ER diagram/image file).
   d. Contributions.
2. Combine all the work into one file in PDF format, and submit the document in this Google form.

3. While compiling the final PDF, please make sure that all the responsibilities and contributions are mentioned clearly (Also, please justify the individual contributions). The contributions can be added in the last.
4. In case the ER diagram needs to be formatted, please feel free to provide a link to the image file.

Note: By submitting this assignment solution, you confirm to follow the IITGN's honor code. We shall strictly penalize the submissions containing plagiarized text/code.

5. References:

If required, please feel free to take help from the following references:

1. Classroom slides [Introduction to Relational Databases][ER Model, Relational Database Design]
2. Resources from stanford.edu [Presentation]
3. ER Diagram [Wikipedia]
4. How to use draw.io [Tutorials]

6. Timeline:

1. Assigned is released on Jan 14th, 2023
2. First reminder - Jan 20th, 2023
3. Second reminder - Jan 25th, 2023
4. Submission - Jan 29th, 2023