Marmara University – Faculty of Engineering – Department of Computer Engineering

Fall 2020 – CSE3055 Database Systems
Homework #2

Due: 07.11.2020.Sat 23:59

1) [50 pts] Consider the following information about a university database:

- Professors have an SSN, a name (composed of firstName and lastName), a birthdate, an age (derived from birthdate), a rank, and a research specialty. A professor can have more than one specialty.
- Projects have a project number, a sponsor name (e.g., NSF), a starting date, an ending date, and a budget.
- Graduate students have an SSN, a name, an age, and a degree program (e.g., M.S. or Ph.D.).
- Each project is managed by one professor (known as the project's principal investigator).
- Each project is worked on by one or more professors (known as the project's co-investigators).
- Professors can manage and/or work on multiple projects.
- Each project is worked on by one or more graduate students (known as the project's research assistants).
- When graduate students work on a project, a professor must supervise their work on the project. Graduate students can work on multiple projects, in which case they will have a (potentially different) supervisor for each one.
- Departments have a department number, a department name, and a main office.
- Departments have a professor (known as the chairman) who runs the department.
- Professors work in one or more departments and for each department that they work in, a time percentage is associated with their job.
- Graduate students have one major department in which they are working on their degree.
- Each graduate student has another, more senior graduate student (known as a student advisor) who advises him or her on what courses to take.

Design and draw an ER diagram that captures the information about the university. Be sure to indicate any key and participation constraints.

Please indicate any assumptions that you have made.

2) [50 pts] Design a database to keep track of information for an art museum. Assume that the following requirements were collected:

- The museum has a collection of ART_OBJECTs. Each ART_OBJECT has a unique ArtObjectID, an Artist (if known), a Year (when it was created, if known), a Title, and a Description. The art objects are categorized in several ways, as discussed below.
- ART_OBJECTs are categorized based on their type. There are two main types: PAINTING, and SCULPTURE, plus another type called OTHER to accommodate objects that do not fall into one of the two main types.
- A PAINTING has a PaintType (oil, watercolor, etc.), material on which it is DrawnOn (paper, canvas, wood, etc.), and Style (modern, abstract, etc.).
- A SCULPTURE has a Material from which it was created (wood, stone, etc.), Height, Weight, and Style. A SCULPTURE might be made up of many Materials.
- An art object in the OTHER category has a Type (print, photo, etc.) and Style.
- ART_OBJECTs are also categorized as either PERMANENT_COLLECTION (objects that are owned by the museum) or BORROWED_COLLECTION.
- Information captured about objects in the PERMANENT_COLLECTION includes DateAcquired, Status (on display, on loan, or stored), and Cost.
- Information captured about BORROWED_COLLECTION objects includes the collection from which it was borrowed, DateBorrowed, and DateReturned.
- Information describing the country or culture of Origin (Italian, Egyptian, American, Indian, and so forth) and Epoch (Renaissance, Modern, Ancient, and so forth) is captured for each ART_OBJECT.
- The museum keeps track of ARTIST information, if known: Name, DateBorn (if known), DateDied (if not living), CountryOfOrigin, Epoch, MainStyle, and Description. The Name is assumed to be unique.
- Different EXHIBITIONs occur, each having a Name (unique), Place, StartDate, and EndDate. EXHIBITIONs are related to all the art objects that were on display during the exhibition. Place is composed of Country, State, and City.
- Information is kept on other COLLECTIONs (related to BORROWED_COLLECTION) with which the museum interacts, including Name (unique), Type (museum, personal, etc.), Description, Address, Phone, and current ContactPerson.

Draw an Enhanced Entity Relationship (EER) schema diagram for this application. Discuss any assumptions you make, and that justify your EER design choices.

IMPORTANT NOTES:

1) Write the following sentence on the first page of your document: "I hereby swear that the work done on this homework is totally my own; and on my honor, I have neither given nor received any unauthorized and/or inappropriate assistance for this homework. I understand that by the school code, violation of these principles will lead to a zero grade and is subject to harsh discipline issues."

2) In case of any form of copying and cheating on solutions, all parts will get ZERO points. You should submit your own work. In case of any forms of cheating or copying, both giver and receiver are equally culpable and suffer equal penalties. All types of plagiarism will result in zero points from the homework.

3) Use a software to draw ER diagrams and submit the output/screenshot of it. If you use your handwriting other than the diagrams, your handwriting should be readable, clear and neat. If possible, do not use any handwriting.

4) Please zip and submit your files using filename YourNumberHW2.zip (e.g.: 150118123HW2.zip) to the site http://ues.marmara.edu.tr before deadline.

5) Do not send homework submissions through e-mail. E-mail attachments will not be accepted as valid submissions.

6) You are responsible for making sure you are turning in the right file, and that it is not corrupted in anyway. We will not allow resubmissions if you turn in the wrong file, even if you can prove that you have not modified the file after the deadline.

7) No groups are allowed.

8) Grade evaluation may be done on selected parts of the homework, so try to complete all parts of your homework successfully.

9) No late submissions will be accepted.