Al Yamamah University Introduction to Database system (CIS221)

## College of Engineering and Architecture Dr. Jawad Berri

Project Part I

**Given date: Week 5**

**Date due: Wednesday 19, October 2023 (Week 9)**

**The project will be carried out by groups each containing 2 students.**

**Software Company Database**

A cloud-based software company owns the license for various expensive software and rents their use remotely to software developers for a period of time in return of money. The company is planning to design a database to follow its renting operations. The following information is needed to keep track of each developer: developer ID (identifier), name, and contact information which includes information about mobile number, email address, and address. To be able to use the company services, a developer must register for an account and he may register for many accounts. Accounts are hold by single developers. An account is uniquely identified by a username and is described by a password and creation date. An account rents at least one software resource and may rent several. A software resource is identified (uniquely) by a software number and we store also the software name, the manufacturer name, the rent cost, a category, and a number of accounts (i.e., representing the total number of accounts actually renting that resource). For each software resource rented, we record the password to be used to access the resource as well as the rent period. Besides, a reward card, defined by a card ID (identifier) is granted to exactly one developer. The reward card is also defined by a description and a set of privileges. Finally, the company tracks account activities that are uniquely identified by a date along with the username of the corresponding account; a tracking activity saves also the time duration.

Using MySQL Workbench data modeling tool, draw the corresponding ER diagram considering the following:

1. Choose convenient domain for each entity type attribute.
2. Specify key attributes for each entity type as well as cardinality ratio and participation constraints for each relationship type.
3. Note any unspecified requirements, and make appropriate assumptions to make the specification complete.
4. Verify the database schema script generated and check the foreign key constraints.
5. Populate the database by adding 4 tuples in each table.

**What to submit:**

Submission must be done through LMS by only one member of the group. The report should include the following:

1. The ER Diagram using the notation covered in the lecture.
2. The ER Diagram from MySQL Workbench data modeling tool editor.
3. The SQL script of the database.

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The following information is needed to keep track of each **developer**: developer ID (identifier), name, and contact information which includes information about mobile number, email address, and address.

To be able to use the company services, a developer must register for an account and he may register for many accounts.

Accounts are hold by single developers.

An account is uniquely identified by a username and is described by a password and creation date.

An account rents at least one software resource and may rent several.

A software resource is identified (uniquely) by a software number and we store also the software name, the manufacturer name, the rent cost, a category, and a number of accounts (i.e., representing the total number of accounts actually renting that resource).

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Notes:

* The derived attribute number\_of\_accounts in software\_resource would better be computed on the fly instead of saving it in the table. That is because it can be derived by counting the number of records in the “rents” relationship that are related to the software\_resource and its rent\_period is still active and didn’t expire.
* The contact\_information composite attribute attributes were represented as separate attributes since the modern relational databases don’t support composite attributes, but they are represented as composite in the ER diagram. When we translate it to the Relational Model, we need to split it to its basic parts.
* rent\_period in the “rents” relation on its own can’t tell us when the rent ends since we don’t know when it started. We need to know when it started to calculate that. So, we decided to use two properties instead of rent\_period to be able to know when it ends accurately. The two properties are:
  + start\_date
  + end\_date