5330: Database Systems I **Fall Semester 2014**

Project 1

Name: **ID:**

Instructions

You can provide your answers in a word document and deliver via **Blackboard**.

The deadline is **October 10th, 2014**.

You are expected to use a SQL DBMS software (preferably MySQL server) to design your database and then transfer your code in a word/latex document.

Please also deliver, within your document, the output of the queries.

For each one of the tasks there is more detailed information about the delivery requirements.

START OF PROJECT DESCRIPTION

You are provided with a description of the following procedure:

Brief description

George wants to organize the collection of his postcards. Those postcards are of various thematic categories (nature, buildings and people). Each one of his postcards dates from a given time period: golden era, silver era and modern era. The condition of his postcards varies from poor to mint (poor, acceptable, good, very good, mint). George every now and then, buys new postcards online. George, wants to somehow keep track of his purchase activity.

Explicit requirements

Read the requirements below carefully, since you are going to apply those for the tasks below.

- Each postcard has a title, a short description and can either be b&w or color.
- Each postcard can be of more than one thematic categories.
- Each postcard belongs in one time era.

- George might want, in the future to use additional thematic categories and time eras.
- Each postcard can exist more than once in George's collection. For example, the postcard *"Romance in Paris-1939i"* exists twice, one in mint condition and the second one in poor condition.
- Each time George buys a postcard, he wants to track down the date of the transaction as well as the price he paid for the postcard.

TASK 1 (10)

A. Make a list of the entities for the above process
B. For each entity define the required attributes and the data type of each of those attributes.

TASK 2 (20)

A. Design the database schema (diagram) using arrows to define the references, based on the description. Your schema can be handwritten at this point.
B. Explain why you took specific decisions regarding:
    - The relations you have created.
    - The cardinality of the relationships.
C. Based on your decisions, make a list of the constraints that are posed on your schema, mentioning the type of each of the constraints.

TASK 3 (20)

A. Write down SQL code to define the above mentioned database schema. Each one of the relations should have the appropriate attributes. You have to think of the appropriate attributes based on the information provided to you at the description of the procedure. Try not to over-do it with many unneeded attributes. We are only building a sample database, so just include those attributes which have to be there.

You have to deliver: the code you used to create your schema and your diagrammatic representation of the schema (you can use the reverse engineering function of MySQL Workbench to accomplish this).

B. Once your schema is ready, provide the appropriate SQL code to populate the database with sample data. The only requirement here is to add enough tuples for **every** referred tuple. You do not need to add more than 10 tuples. The only reason you need to add data is to make the output of your query make sense. Please make sure you have a couple of postcards to be

existing twice in George's collection. You have to deliver ALL the database relations populated with data (or in other words your database state).

C. What would be the INITIAL STATE of your database?

TASK 4 (40)

Based on the above database go on and create appropriate queries for the following

a. Show all the postcards that George has in his collection
b. Show the number of postcards George has in his collection
c. Show the unique postcards George has in his collection
d. Show the duplicate postcards George has in his collection
e. Show the postcards purchased after a given year (you decide) with a thematic category "people"
f. Show the postcards purchased belonging into the golden era which are of thematic category "people" or "buildings".
g. Show a list with George's multi-themed postcards
h. Show how much money George has paid so far for silver era postcards.
i. Show the average price of the postcards for each different condition category.
j. Show the largest amount of money paid for one postcard by George, which is not in "poor" condition

You are expected to deliver the following:

1. The SQL code for your queries
2. The output of each of your queries.

TASK 5 (10)

Create three different views which will accommodate the two different needs.

a. The postcard title with the money paid and the condition.
b. The postcard title with the thematic category and the time era.
c. The average amount of money paid for each unique postcard, alongside with info about the thematic category.

END OF PROJECT DESCRIPTION