Database Management Systems (COP 5725)
(Spring 2017)

Instructor: Dr. Markus Schneider

TAs: Keke Zhai, Man Mohan Devineni

Homework 1

Name: 
UFID: 
Email Address: 

Pledge (Must be signed according to UF Honor Code)

On my honor, I have neither given nor received unauthorized aid in doing this assignment.

______________________________________________
Signature

For scoring use only:

<table>
<thead>
<tr>
<th>Exercise</th>
<th>Maximum</th>
<th>Received</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exercise 1</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>Exercise 2</td>
<td>30</td>
<td></td>
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<tr>
<td>Exercise 3</td>
<td>40</td>
<td></td>
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<tr>
<td>Total</td>
<td>100</td>
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</tbody>
</table>
Exercise 1 (Knowledge Questions) [30 points]

Please provide concise but precise answers.

1. What are the problems of early data processing? [6 points]

2. List 3 advantages of database systems compared to file systems? [6 points]

3. What is a database? What is a DBMS? What is the relationship of database and DBMS? [4 points]

4. What is the 3-level model of DBS? Explain it briefly. [3 points]

5. Explain the concept of data independence, and give two examples that use this concept in DBS according to the question above and explain. [4 points]

6. What is the difference between DDL and DML? [4 points]

7. Describe 3 tables that might be used to store information in an online shopping website. [3 points]
Exercise 2 (Oracle) [30 points]

Consider the following table ‘CLASS’ maintained by a class database.

<table>
<thead>
<tr>
<th>ClassID</th>
<th>Title</th>
<th>Time</th>
<th>Location</th>
<th>Room</th>
<th>Department</th>
<th>Professor</th>
</tr>
</thead>
<tbody>
<tr>
<td>1001</td>
<td>Embedded System</td>
<td>3:00-3:50</td>
<td>MCCC</td>
<td>100</td>
<td>CSE</td>
<td>Mish</td>
</tr>
<tr>
<td>1002</td>
<td>Machine Learning</td>
<td>3:00-4:55</td>
<td>CSE</td>
<td>E121</td>
<td>CSE</td>
<td>Baner</td>
</tr>
<tr>
<td>1003</td>
<td>Software Engineering</td>
<td>9:35-10:25</td>
<td>CSE</td>
<td>E121</td>
<td>CSE</td>
<td>Judy</td>
</tr>
<tr>
<td>1004</td>
<td>Graphics</td>
<td>10:40-12:35</td>
<td>CSE</td>
<td>E121</td>
<td>CSE</td>
<td>Michael</td>
</tr>
<tr>
<td>1005</td>
<td>Electronic Circuits 1</td>
<td>8:30-10:25</td>
<td>LAR</td>
<td>310</td>
<td>ECE</td>
<td>Yoon</td>
</tr>
<tr>
<td>1006</td>
<td>Bioelectrical Systems</td>
<td>1:55-2:45</td>
<td>LAR</td>
<td>239</td>
<td>ECE</td>
<td>Judy</td>
</tr>
<tr>
<td>1007</td>
<td>Acoustics</td>
<td>1:55-2:45</td>
<td>BEN</td>
<td>328</td>
<td>ECE</td>
<td>Mark</td>
</tr>
<tr>
<td>1008</td>
<td>Circuits</td>
<td>7:25-8:15</td>
<td>ECE</td>
<td>101</td>
<td>ECE</td>
<td>James</td>
</tr>
</tbody>
</table>

ClassID is the primary key. Use your CISE Oracle account to create this table and perform the operations below. Provide SQL statements for all operations. Show the outputs of all results as screen snapshots in Oracle. [5 points each]

(1) Create the CLASS table.

(2) Insert all the records into the table.

(3) Find the list of class titles held in the time period from 1:55-2:45.

(4) Find the list of class title that department and location is not the same, and the room number is 239.

(5) Find the list of class ids whose professor is Judy and whose titles have 'engineering' in their names (case insensitive).

(6) How many classes are in the ‘CLASS’ table? Store the result under the attribute Total.
Exercise 3 (ER Model) [40 points]

Consider the following requirements about an online restaurant review system:

- Every restaurant has a unique ID, name, location (includes street, city, state, and zip code), distance to the user, brief description, and the url to the restaurant website.
- Restaurant sells dishes. Each dishes has a unique ID, name, picture and price. Assume that no restaurant sells the same dishes.
- Dishes are cooked by cooks. Each cook has a unique employee id and name. Each restaurant employs multiple cooks to cook dishes.
- Each online user must have an email address (which is used to log in), a password and a name. They can also provide age and gender to the system.
- Online users can write reviews for restaurants. A review has a title, content, a score ranging 1-5, and a timestamp which identifies each review.
- Online users can also make friends. They can add one another as a friend. Friend is bi-directional, meaning “A is a friend of B” implies that “B is a friend of A”.

Design an Entity-Relationship diagram that models the online restaurant review system and takes into account the requirements listed above. That means that you have to identify suitable entity sets, relationship sets, attributes, keys of entity sets, and so on. Further add the cardinalities (1:1, 1:m, m:1, m:n) to the relationship sets.