CSCI-GA.2433-001
Database Systems

Lecture 12: Revision

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Questions

• What is the difference between DB and DBMS? and why do we need to separate them?
• What is the difference between data model and conceptual schema?
ER Model

• Give the ER diagram for a DB recording information about teams, players, and their fans, including:
  – For each team, its name, its players, its team captain (one of the players), and the colors of the uniform.
  – For each player, his/her name
  – For each fan, his/her name, favorite teams, favorite players, and favorite colors

• Remember that a set of colors is not a suitable attribute type for teams. How will you go around this?
Given the following schema (primary keys are in italics):

- Course
- Prereqs
- Student
- Faculty
- TakenBy
- TaughtBy

• Can more than one student take a particular course? Why or why not?
• Can a faculty member teach more than one course? Why or why not?
• Can a student have more than one grade for the same course? Why or why not?
• Write the SQL query to give the names of all students who have never taken a course by Jack.
• Can we say something about the relational algebra of the execution of the above query?
Give an example of a relation, from real life, that can be in 1NF but NOT in 2NF?
Given the following relation:

<table>
<thead>
<tr>
<th>City</th>
<th>E#</th>
<th>EN</th>
<th>Skill</th>
<th>$</th>
<th>Age</th>
</tr>
</thead>
<tbody>
<tr>
<td>NYC</td>
<td>3</td>
<td>John</td>
<td>3</td>
<td>4</td>
<td>24</td>
</tr>
<tr>
<td>LA</td>
<td>4</td>
<td>Sally</td>
<td>3</td>
<td>4</td>
<td>27</td>
</tr>
<tr>
<td>LA</td>
<td>2</td>
<td>Bill</td>
<td>4</td>
<td>5</td>
<td>24</td>
</tr>
<tr>
<td>LA</td>
<td>3</td>
<td>John</td>
<td>6</td>
<td>9</td>
<td>24</td>
</tr>
<tr>
<td>NYC</td>
<td>7</td>
<td>Karen</td>
<td>2</td>
<td>6</td>
<td>19</td>
</tr>
<tr>
<td>Chi</td>
<td>2</td>
<td>Bill</td>
<td>3</td>
<td>4</td>
<td>27</td>
</tr>
</tbody>
</table>

If we assume that the data presented here gives all kind of dependencies presented in this relation:

• State all dependencies that you can see.
• What can you choose as primary key?
• Put the table in 1NF
• Put the table in 2NF (i.e. 1NF and no partial dependency)
• Put the table in 3NF (i.e. 2NF and no transitive dependency)
Reminder

- Exam is closed book notes
- Exam is in the same place and time as the lecture.
- The instructor and graders may randomly change the sitting, so be prepared to move to another seat if requested to do so.