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CS 480

ID: 679025059 Database Systems

Fall 2019

Homework #1

Complete By: Wednesday, September 4th @ 5:00pm

Submission: collected at beginning of class on paper or submitted digitally through Gradescope

# Reading Tables

On the following two pages is a set of data that was stored in a database. There are three tables extracted from the database which store between them some information the company keeping the database finds useful. Read through this data in order to answer the questions that follow.

**Employee Table**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Employee\_ID** | **Employee\_Fname** | **Employee\_Lname** | **Employee\_HireDate** | **Employee\_Title** |
| 2345 | Brian | Oates | 2/14/99 | DBA |
| 3373 | Franklin | Johnson | 3/15/06 | Purchasing Agent |
| 4893 | Patricia | Richards | 6/11/08 | DBA |
| 6234 | Jasmine | Patel | 8/10/09 | Programmer |
| 8273 | Marco | Bienz | 7/28/10 | Analyst |
| 9002 | Wade | Gather | 5/20/14 | Clerk |
| 9283 | Juan | Chavez | 7/4/14 | Clerk |
| 9382 | Susan | Mathis | 8/2/14 | Database Programmer |
| 13383 | Raymond | Matthews | 3/12/16 | Programmer |

**Certified Table**

|  |  |  |
| --- | --- | --- |
| **Employee\_ID** | **Skill\_ID** | **Certified\_Date** |
| 2345 | 100 | 2/14/04 |
| 2345 | 110 | 8/9/05 |
| 2345 | 180 | 2/14/07 |
| 3373 | 120 | 6/20/13 |
| 4893 | 180 | 6/11/08 |
| 4893 | 220 | 9/20/14 |
| 6234 | 110 | 8/10/09 |
| 6234 | 200 | 8/10/09 |
| 6234 | 210 | 1/29/14 |
| 8273 | 110 | 3/8/11 |
| 8273 | 190 | 8/19/14 |
| 9002 | 110 | 5/16/15 |
| 9002 | 120 | 5/16/15 |
| 9382 | 140 | 8/2/14 |
| 9382 | 210 | 8/2/14 |
| 9382 | 220 | 5/1/15 |
| 13383 | 170 | 3/12/16 |

**Skill Table**

|  |  |  |
| --- | --- | --- |
| **Skill\_ID** | **Skill\_Name** | **Skill\_Description** |
| 100 | Basic Database Management | Create and manage database user accounts |
| 110 | Basic Web Design | Create and maintain HTML and CSS documents |
| 120 | Advanced Spreadsheets | Use of advanced functions, user-defined functions, and macroing |
| 130 | Basic Process Modeling | Create core business process models using standard libraries |
| 140 | Basic Database Design | Create simple data models |
| 150 | Master Database Programming | Create integrated trigger and procedure packages for a distributed environment |
| 160 | Basic Spreadsheets | Create single tab worksheets with basic formulas |
| 170 | Basic C# Programming | Create single-tier data aware modules |
| 180 | Advanced Database Management | Manage Database Server Clusters |
| 190 | Advanced Process Modeling | Evaluate and Redesign cross-functional and external business processes |
| 200 | Advanced C# Programming | Create multi-tier applications using multi-threading |
| 210 | Basic Database Manipulation | Create simple data retrieval and manipulation statements in SQL |
| 220 | Advanced Database Manipulation | Use of advanced data manipulations methods for multi-table inserts, sets operations and correlated subqueries. |

1. What is the domain from which this data might have been taken?  
     
   Human Resources
2. What is being represented by the data in these tables? What does this data allow us to describe?  
     
   The Employee table has the information about the Ids, names, hired dates and designations of the employees. In the certified table, the information about the employees’ skills and certification dates are being represented. And the skill table has the information about the skill Ids, skill names and their descriptions. This data allows us to describe the experience and skills of the employees.
3. What might you do with this data? Name three potential uses of the data, questions a company might ask that could be answered by this data set. Do not use questions that are nearly identical to the ones asked in this assignment or each other.

Uses:

1. We could find who has knowledge in a field.
2. We could use the skill table to know about the skill descriptions.
3. And we could identify the designations of the employees using the Employee table.

Question a company might ask:  
1) Who has the experience of more than 5 years, and has skills of basic database design and basic database design manipulation?

2) Who is more experienced employee?

3) Who has a greater number of Skills?

1. How many records are contained in the Employee table?  
     
   Nine
2. How many fields are there per record?

Five in case of the Employee table

1. What is the domain of the Employee\_HireDate attribute of the Employee relation?

The domain of an attribute is the set of values it could take. So, its domain is from 2/14/99 to 3/12/16 inclusive.

1. The information in this database is divided into three tables. The data could be divided up differently, into more or fewer tables. Suggest an alternative design, with at least one benefit and one limitation of staring the data in that format.

-We could club the skill table and certified table as skill and certified table which would make easier to identify skills for an employee and would also decrease the space occupied, but it results in larger table.

**Employee Table**

|  |  |  |  |
| --- | --- | --- | --- |
| **Employee\_ID** | **Employee\_Name** | **Employee\_HireDate** | **Employee\_Title** |
| 2345 | Brian Oates | 2/14/99 | DBA |
| 3373 | Franklin Johnson | 3/15/06 | Purchasing Agent |
| 4893 | Patricia Richards | 6/11/08 | DBA |
| 6234 | Jasmine Patel | 8/10/09 | Programmer |
| 8273 | Marco Bienz | 7/28/10 | Analyst |
| 9002 | Wade Gather | 5/20/14 | Clerk |
| 9283 | Juan Chavez | 7/4/14 | Clerk |
| 9382 | Susan Mathis | 8/2/14 | Database Programmer |
| 13383 | Raymond Matthews | 3/12/16 | Programmer |

**Skill and certified Table**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Employee\_ID** | **Skill\_ID** | **Certified\_Date** | **Skill** | **Skill\_Description** |
| 2345 | 100 | 2/14/04 | Basic Database Management | Create and manage database user accounts |
| 2345 | 110 | 8/9/05 | Basic Web Design | Create and maintain HTML and CSS documents |
| 2345 | 180 | 2/14/07 | Advanced Database Management | Manage Database Server Clusters |
| 3373 | 120 | 6/20/13 | Advanced Spreadsheets | Use of advanced functions, user-defined functions, and macroing |
| 4893 | 180 | 6/11/08 | Advanced Database Management | Manage Database Server Clusters |
| 4893 | 220 | 9/20/14 | Advanced Database Manipulation | Use of advanced data manipulations methods for multi-table inserts, sets operations and correlated subqueries. |
| 6234 | 110 | 8/10/09 | Basic Web Design | Create and maintain HTML and CSS documents |
| 6234 | 200 | 8/10/09 | Advanced C# Programming | Create multi-tier applications using multi-threading |
| 6234 | 210 | 1/29/14 | Basic Database Manipulation | Create simple data retrieval and manipulation statements in SQL |
| 8273 | 110 | 3/8/11 | Basic Web Design | Create and maintain HTML and CSS documents |
| 8273 | 190 | 8/19/14 | Advanced Process Modeling | Evaluate and Redesign cross-functional and external business processes |
| 9002 | 110 | 5/16/15 | Basic Web Design | Create and maintain HTML and CSS documents |
| 9002 | 120 | 5/16/15 | Advanced Spreadsheets | Use of advanced functions, user-defined functions, and macroing |
| 9382 | 140 | 8/2/14 | Basic Database Design | Create simple data models |
| 9382 | 210 | 8/2/14 | Basic Database Manipulation | Create simple data retrieval and manipulation statements in SQL |
| 9382 | 220 | 5/1/15 | Advanced Database Manipulation | Use of advanced data manipulations methods for multi-table inserts, sets operations and correlated subqueries. |
| 13383 | 170 | 3/12/16 | Basic C# Programming | Create single-tier data aware modules |

1. What skill(s) is Jasmine Patel certified in? List the names of the skills.  
     
   Jasmine Patel is certified in the following skills:
2. Basic Web Design
3. Advanced C# Programming
4. Basic Database Manipulation
5. Who are the employee(s) who are certified in Advanced Database Management?  
     
   Patricia Richards and Brian Oates are the ones who are certified in Advanced Database Management.
6. Is there an employee who has been working at the company for more than 10 years (as of today’s date) and has training in Advanced Database Manipulation?

- Yes. Patricia Richards