CS60 Project 1 2012 Fall

Due Monday September 17 at 11 pm

As a MS Word file, answer the eight questions or tasks below. To save time, copy this file from the CS60 Projects folder and edit it. After completing the project, copy and paste your file to the server Zeus as described in the syllabus.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Project\_  Code | Project\_Manager | Manager\_Phone | Manager\_Address | Project\_Bid\_Price |
| 21 | Holly Ba Parker | 904-111-1111 | 3334 Lee Rd., Gainesville, FL 37123 | $16,000,000 |
| 22 | Jane Dorts Grant | 615-222-2222 | 218 Clark Blvd., Nashville, TN 36362 | $12,000,000 |
| 23 | George Grant Dorts | 615-333-3333 | 124 Nashville Dr., Lee, TN 29185 | $32,000,000 |
| 24 | Holly Ba Parker | 904-111-1111 | 3334 Lee Rd., Gainesville, FL 37123 | $21,000,000 |
| 25 | George Grant Dorts | 615-333-3333 | 124 Nashville Dr., Lee, TN 29185 | $10,000,000 |
| 26 | Holly Parker | 904-111-1111 | 3334 Lee Rd., Gainesville, FL 37123 | $25,000,000 |
| 27 | William Ko Jo Moore | 904-444-4444 | 216 Santa Monica St., Stetson, FL 30155 | $56,000,000 |
| 28 | Frank Smith | 904-555-5555 | 1234 Main St., Santa Monica, CA 90405 | $100,000 |

1. How many records (rows) does the above table store, and how many fields (columns or attributes) are in each record?

Answer: 8 records / rows with 5 fields in each record

2. What problem would you encounter if you wanted to list the records in order of the manager’s last name, or if you sometimes wanted to omit the first name or middle name? Show the table structure of an altered table that will correct this problem? Show all columns in this revised table.

Answer: the Project Manager field contains a value that is the full name of a manager, thus by searching by the last name the value would be incomplete and the record would not be found. To correct this one would have to create two more attributes or columns and divide the full name into first, middle and last name of project manager.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Project\_  Code | Project Manager first name | Project Manager middle name | Project Manager last name | Manager Phone | Manager Address | Project Bid Price |
| 21 | Holly | Ba | Parker | 904-111-1111 | 3334 Lee Rd., Gainesville, FL 37123 | $16,000,000 |
| 22 | Jane | Dorts | Grant | 615-222-2222 | 218 Clark Blvd., Nashville, TN 36362 | $12,000,000 |
| 23 | George | Grant | Dorts | 615-333-3333 | 124 Nashville Dr., Lee, TN 29185 | $32,000,000 |
| 24 | Holly | Ba | Parker | 904-111-1111 | 3334 Lee Rd., Gainesville, FL 37123 | $21,000,000 |
| 25 | George | Grant | Dorts | 615-333-3333 | 124 Nashville Dr., Lee, TN 29185 | $10,000,000 |
| 26 | Holly | Ba | Parker | 904-111-1111 | 3334 Lee Rd., Gainesville, FL 37123 | $25,000,000 |
| 27 | William | Ko Jo | Moore | 904-444-4444 | 216 Santa Monica St., Stetson, FL 30155 | $56,000,000 |
| 28 | Frank |  | Smith | 904-555-5555 | 1234 Main St., Santa Monica, CA 90405 | $100,000 |

3. What problem would you encounter if you wanted to list the records in order of the street address, city, state, or zip, or area code? Show the table structure of an altered table that corrects this problem? Show all columns in this revised table.

Answer: the Manager Address field contains a value that is the full address of a manager, thus by searching by street address, city, state, or zip, the value would be incomplete and the record would not be found. To correct this one would have to create three more attributes or columns and divide the full address into street address, city, state and zip of project manager.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Project\_  Code | Project Manager first name | Project Manager middle name | Project Manager last name | Manager Phone | Manager Street Address | Manager Hometown | Manager Homestate | Manager Zip Code | Project Bid Price |
| 21 | Holly | Ba | Parker | 904-111-1111 | 3334 Lee Rd. | Gainesville | FL | 37123 | $16,000,000 |
| 22 | Jane | Dorts | Grant | 615-222-2222 | 218 Clark Blvd. | Nashville | TN | 36362 | $12,000,000 |
| 23 | George | Grant | Dorts | 615-333-3333 | 124 Nashville Dr | Lee | TN | 29185 | $32,000,000 |
| 24 | Holly | Ba | Parker | 904-111-1111 | 3334 Lee Rd | Gainesville | FL | 37123 | $21,000,000 |
| 25 | George | Grant | Dorts | 615-333-3333 | 124 Nashville Dr | Lee | TN | 29185 | $10,000,000 |
| 26 | Holly | Ba | Parker | 904-111-1111 | 3334 Lee Rd. | Gainesville | FL | 37123 | $25,000,000 |
| 27 | William | Ko Jo | Moore | 904-444-4444 | 216 Santa Monica St | Stetson, | FL | 30155 | $56,000,000 |
| 28 | Frank |  | Smith | 904-555-5555 | 1234 Main St., , | Santa Monica | CA | 90405 | $100,000 |

4. What data redundancies do you detect? How could these redundancies lead to update anomalies, delete anomalies, or insert anomalies?

Answer: the redundancies of the final table are the following: employee names, phone numbers and addresses. These redundancies could lead to anomalies, such as outdated information given hasty update: e.g. an employee’s address is updated only in one record, not all records where it appears; also deleting an employee from one record and leaving them in another.

5. Using two relational tables, PROJECT and MANAGER, eliminate the redundancies you identified in Problem 4. Identify the primary key in each table. Identify a foreign key in one table that will reference a primary key in the other table. With an arrow or words, show how the two tables join together by a foreign key that references a primary key. In this problem, show the column names across the top of each table and the rows of raw data below the column names. The columns must correct the faults you saw above.

PROJECT TABLE

|  |  |  |
| --- | --- | --- |
| Project Code | Project Bid Price | Manager ID |
| 21 | $16,000,000 | 01 |
| 22 | $12,000,000 | 02 |
| 23 | $32,000,000 | 03 |
| 24 | $21,000,000 | 01 |
| 25 | $10,000,000 | 03 |
| 26 | $25,000,000 | 01 |
| 27 | $56,000,000 | 04 |
| 28 | $100,000 | 05 |

MANAGER TABLE

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Manager ID | First name | Middle name | Last name | Phone# | Street Address | City | State | Zip |
| 01 | Holly | Ba | Parker | 904-111-1111 | 3334 Lee Rd. | Gainesville | FL | 37123 |
| 02 | Jane | Dorts | Grant | 615-222-2222 | 218 Clark Blvd. | Nashville | TN | 36362 |
| 03 | George | Grant | Dorts | 615-333-3333 | 124 Nashville Dr. | Lee | TN | 29185 |
| 04 | William | Ko Jo | Moore | 904-444-4444 | 216 Santa Monica St. | Stetson | FL | 30155 |
| 05 | Frank |  | Smith | 904-555-5555 | 1234 Main St. | Santa Monica | CA | 90405 |

6. Create the **relational schema** to show the two tables and their columns, primary keys, foreign key, a line that shows how the two tables join, and the symbols 1 and ∞ (for *many*). A relational schema has a rectangle for each table and includes the table name, but lists the column names one-by-one after the tablename in the rectangle. A relational schema is shown in CS60 Chapter 02,page 50. A relational schema uses the infinity symbol (∞) for *Many.* The columns must correct the faults you saw above.

Template for a relational schema that you can edit; label tablenames, column names, add or remove columns, connect the foreign key to the primary key with line(s), get the positioning of the connectivities (the 1 and M ) correct.

Manager table

Project table

1

|  |
| --- |
| **Manager ID** |
| First name |
| Middle name |
| Last name |
| Phone# |
| Street address |
| City |
| State |
| Zip |
|  |

|  |
| --- |
| **Project Code** |
|  |
| Project Bid Price |
| Manager ID |

Many

7. Based on the table below, identify pairs of columns that for the same value in one column, the 2nd column also has the same value. Such columns are **dependent** upon each other, or one column **determines** the other.

Answer: columns Project Number and Project Name also Employee Number, Employee Name and Employee Phone and also Job Code and Job Charge Hour are pairs that repeat exctly.

8. These dependencies lead to what redundancies in the table (what data is being stored redundantly)?

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Project\_  Number | Project\_  Name | Employee\_  Number | Employee\_  Name | Job\_  Code | Job\_Charge\_  Hour | Project\_  Hours | Employee\_  Phone |
| 1 | Hurricane | 101 | John D. Newson | EE | $85.00 | 13.3 | 653-234-3245 |
| 1 | Hurricane | 105 | David E. Schwann | CT | $60.00 | 16.2 | 653-234-1123 |
| 1 | Hurricane | 110 | Anne R. Ramoras | CT | $60.00 | 14.3 | 615-233-5568 |
| 2 | Coast | 101 | John D. Newson | EE | $85.00 | 19.8 | 653-234-3245 |
| 2 | Coast | 108 | June H. Settlemeir | EE | $85.00 | 17.5 | 905-554-7812 |
| 3 | Satellite | 110 | Anne R. Ramoras | CT | $60.00 | 11.6 | 615-233-5568 |
| 3 | Satellite | 105 | David E. Schwann | CT | $60.00 | 23.4 | 653-234-1123 |
| 3 | Satellite | 123 | Mary D. Chen | EE | $85.00 | 19.1 | 615-233-5432 |
| 3 | Satellite | 112 | Allecia R. Smith | BE | $85.00 | 20.7 | 615-678-6879 |

Answer: I personally would include as little information as possible for the main table, by which I mean that I would leave the project number in the main table, which is one digit, and create a project table with the project names, I would leave the employee number in the table and create an employee table with the names and phone#s, and I would also leave the job code and create a job table that includes the job charge hours. Obviously the attributes that would be moved in the individual tables can be considered REDUNDANT.