

CS60 Project 1 2017 Fall

Due Monday, September 18 at 10:30pm for CS60 Section 4502

Due Tuesday, September 19 at 10:30pm for CS60 Section 4127

Copy this Word file from \\acshare\BusData\ROGLER_HAROLD\CS60 Database Concepts and Applications\CS60 Projects folder, rename the file to have form CS60_1_SectionNumber_Lastname_Firstname.docx, edit the footer, and edit other parts to answer the eight questions below. After completing the project, copy and paste your file to \\zeus\Data\ROGLER_HAROLD\CS60 Database Concepts and Applications\SectionNumber as described in the syllabus. Copying and pasting your file to Zeus must take place from SMC, not across the internet.

Project_Code	Project_Manager	Manager_Phone	Manager_Address	Project_Bid_Price
21	Holly Ba Parker	904-111-1111	3334 Venice, Ste. 10, Gainesville, FL 37123	\$16,000,000
22	Jane Dorts Grant	615-222-2222	218 Clark Blvd., Venice, TN 36362	\$12,000,000
23	George Grant Dorts	615-333-3333	124 Nashville Dr., Lee, TN 29185	\$32,000,000
24	Holly Parker	904-111-1111	3334 Venice Blvd., 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 Ba Parker	904-111-1111	3334 Venice St., 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 of raw data) does the above table store, and how many fields (columns or attributes) are in each record?

8 rows, 5 columns

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 in a display or printout? This design fault is referred to as a **composite attribute**. Show the table structure of an altered table that will correct this problem? Show all columns and rows of raw data in this revised table.

Project_Code	Project_Manager Last Name	Project_Manager Middle Name	Project_Manager First Name	Manager_Phone	Manager_Address	Project_Bid_Price
21	Parker	Ba	Holly	904-111-1111	3334 Venice, Ste. 10, Gainesville, FL 37123	\$16,000,000
22	Grant	Dorts	Jane	615-222-2222	218 Clark Blvd., Venice, TN 36362	\$12,000,000
23	Dorts	Grant	George	615-333-3333	124 Nashville Dr., Lee, TN 29185	\$32,000,000
24	Parker		Holly	904-111-1111	3334 Venice Blvd., Gainesville, FL 37123	\$21,000,000
25	Dorts	Grant	George	615-333-3333	124 Nashville Dr., Lee, TN 29185	\$10,000,000
26	Parker	Ba Ba	Holly	904-111-1111	3334 Venice St., Gainesville, FL 37123	\$25,000,000
27	Moore	Ko Jo	William	904-444-4444	216 Santa Monica St., Stetson, FL 30155	\$56,000,000
28	Smith		Frank	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? Building upon the improvements that you've already made, show the table structure of an altered table that also corrects this problem? **Show all columns and rows in this revised**

Project_ Code	Project_ Manager Last Name	Project_ Manager Middle Name	Project_ Manager First Name	Manager_Phone	Street_ Address	Street_ Name	Street_ Type	Unit	City	Stat e	Zip_Code	Project_Bid_Price
21	Parker	Ba	Holly	904-111-1111	3334	Venice	Street	10	Gainesville	FL	37123	\$16,000,000
22	Grant	Dorts	Jane	615-222-2222	218	Clark	Bouleva rd	null	Venice	TN	36362	\$12,000,000
23	Dorts	Grant	George	615-333-3333	124	Nashvil le	Drive	null	Lee	TN	29185	\$32,000,000
24	Parker		Holly	904-111-1111	3334	Venice	Bouleva rd	null	Gainsville	FL	37123	\$21,000,000
25	Dorts	Grant	George	615-333-3333	124	Nashvil le	Drive	null	Lee	FL	29185	\$10,000,000
26	Parker	Ba Ba	Holly	904-111-1111	3334	Venice	Street	null	Gainsville	FL	37123	\$25,000,000
27	Moore	Ko Jo	William	904-444-4444	216	Santa Monica	Street	null	Stetson	FL	30155	\$56,000,000
28	Smith	↓	Frank	904-555-5555 ↑	1234	Main	Street	null	Santa Monica	CA	90405	↑ \$100,000

table, including the new ones from Step 2.

4. What data redundancies do you detect; i.e., what unnecessary repetitions are occurring? How could these redundancies lead to update anomalies, delete anomalies, or insert anomalies?

One data repetition that I am seeing is the project manager name. It is causing names to be input incorrectly. This is making the data less valid. The user names are input differently which brings up the question, 'are there that many people who have slightly similar names? '

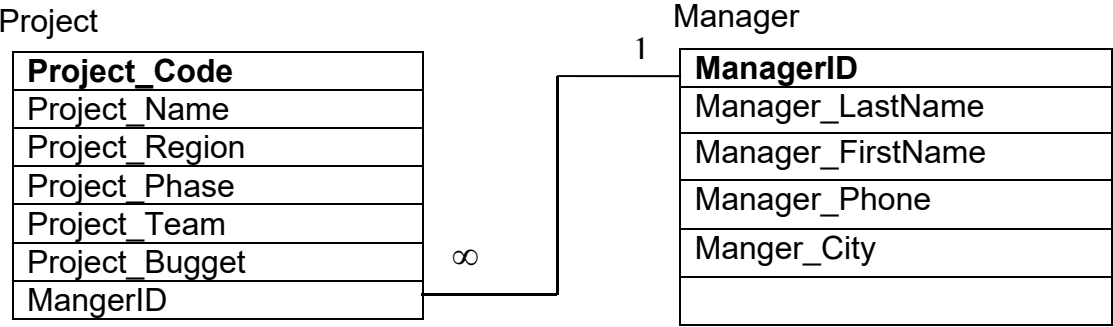
5. Using two relational tables, PROJECT and MANAGER, eliminate the redundancies you identified in Problem 4. Create a ManagerID column in both tables so you can link the two tables with the ManagerID being the primary key in MANAGER and a foreign key in PROJECT. Identify the primary key in each table. With words, show how the two tables join together by a foreign key that references a primary key. A format that would be useful is

Tablename.Columnname references Tablename.Columnname.	
<i>Foreign Key</i>	<i>Primary Key</i>

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 all faults (composite attributes and redundancies) that you saw above.

PROJECT.ManagerID references MANAGER_ManagerID.	
<i>Foreign Key</i>	<i>Primary Key</i>

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*). As shown in the template on the following page that you can edit, 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.**



A new table for questions 7 and 8:

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

7. Based on the table above, 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. You could write this functional relationship as

Column2 = function(Column1)
 Employee_Number = function(Employee_Name)
 Employee_Name = function(Employee_Number)
 Job_Code = function(Employee_Number)
 Project_Number = function(Employee_Number)
 Job_Charge_Hour = function(Job_Code)

Unlike mathematical functions such as $y = x^2$ and functions that are plotted or graphed as $y = f(x)$, this function is a tabular function with data stored in a table.

8. These dependencies lead to what redundancies in the table (what data is being stored redundantly)? Do you see any relationship between the pairs of columns that you identified in Question 7 and the occurrence of redundancies?

This one table would have to have a main table topic (view/structure). The data in this table should be describing some type of view or structuring the data in some logical way. I would say that the project takes precedence here. This data should favor viewing project data. There are some redundancies in the Project_Number and Project_Name. We see those records appear multiple times. We could have project numbers show up once. Then have a column named project team with Employee_ID in a single cell. That data type would be an array.

Project_ Number	Project_ Name	Employee_ Team (Array of foreign keys)
1	Hurricane	101, 105, 110
2	Coast	101, 108
3	Satellite	110, 105, 123, 112

∞

1

Project_ Name	Employee_ Number	Employee_ Name	Job_ Code	Job_Charge_ Hour	Project_ Hours	Employee_ Phone
Hurricane	101	John D. Newson	EE	\$85.00	13.3	653-234-3245
Hurricane	105	David E. Schwann	CT	\$60.00	16.2	653-234-1123
Hurricane	110	Anne R. Ramoras	CT	\$60.00	14.3	615-233-5568
Coast	101	John D. Newson	EE	\$85.00	19.8	653-234-3245
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