Week-7 Tutorial

Introduction to SQL

1. Explain the difference between an ORDER BY clause and a GROUP BY clause.

2. What is the difference between the COUNT aggregate function and the SUM aggregate function?

3. In a SELECT query, what is the difference between a WHERE clause and a HAVING clause?

4. What is a subquery, and what are its basic characteristics?

5. The ConstructCo database stores data for a consulting company that tracks all charges to projects. The charges are based on the hours each employee works on each project. The structure and contents of the ConstructCo database are shown in Figure 1.

Figure 1: ConstructCo Database
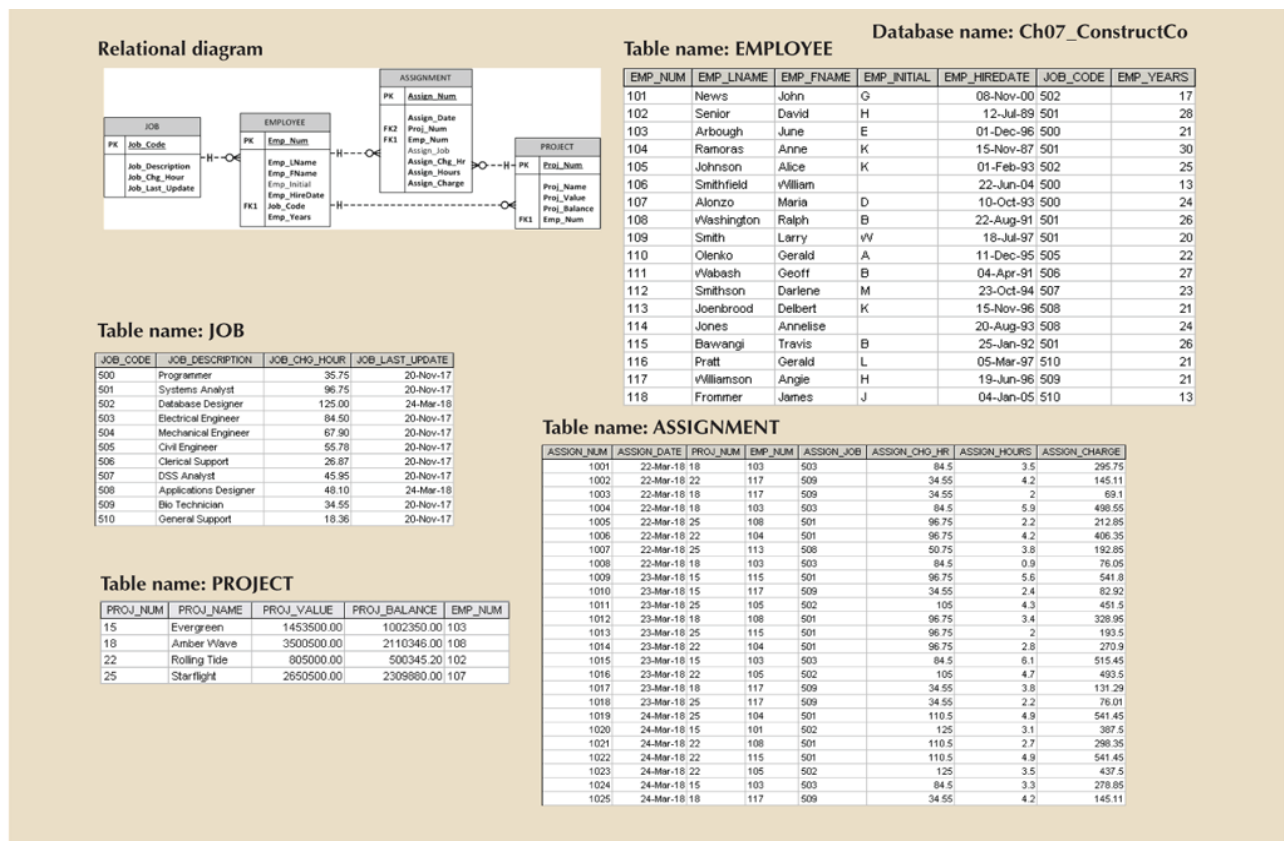
Note that the ASSIGNMENT table in Figure 1 stores the JOB_CHG_HOUR values as an attribute (ASSIGN_CHG_HR) to maintain historical accuracy of the data. The JOB_CHG_HOUR values are likely to change over time. In fact, a JOB_CHG_HOUR change will be reflected in the ASSIGNMENT table. Naturally, the employee primary job assignment might also change, so the ASSIGN_JOB is

also stored. Because those attributes are required to maintain the historical accuracy of the data, they are not redundant.

Given the structure and contents of the ConstructCo database shown in Figure 1, use SQL commands to answer the questions below:

1. Download the following file from the Moodle: 07_ConstructCo_mysql_txt.

2. Import file into XAMPP.

3. Write a query to count the number of projects.

4. Write a query to count the number of Employees with the Assign charge more than 150.

5. Write the SQL code required to list the employee number, last name, first name, and middle initial of all employees whose last names start with Smith. In other words, the rows for both Smith and Smithfield should be included in the listing. Sort the results by employee number.

6. Using the EMPLOYEE, JOB, and PROJECT tables in the ConstructCo database, write the SQL code that will join the EMPLOYEE and PROJECT tables using EMP_NUM as the common attribute. Display the attributes shown in the results presented in Figure 2, sorted by project value.

   Figure 2

PROJ_NAME	PROJ_VALUE	PROJ_BALANCE	EMP_LNAME	EMP_FNAME	EMP_INITIAL	JOB_CODE	JOB_DESCRIPTION	JOB_CHG_HOUR
Rolling Tide	805000.00	500345.20	Senior	David	H	501	Systems Analyst	96.75
Evergreen	1453500.00	1002350.00	Arbough	June	E	500	Programmer	35.75
Starflight	2650500.00	2309880.00	Alonzo	Maria	D	500	Programmer	35.75
Amber Wave	3500500.00	2110346.00	Washington	Ralph	B	501	Systems Analyst	96.75

7. Write the SQL code that will produce the same information that was shown in Figure 2, but sorted by the employee's last name.

8. Write the SQL code that will list only the distinct project numbers in the ASSIGNMENT table, sorted by project number.

9. Write the SQL code to validate the ASSIGN_CHARGE values in the ASSIGNMENT table. Your query should retrieve the assignment number, employee number, project number, the stored assignment charge (ASSIGN_CHARGE), and the calculated assignment charge (calculated by multiplying ASSIGN_CHG_HR by ASSIGN_HOURS). Sort the results by the assignment number.

10. Using the data in the ASSIGNMENT table, write the SQL code that will yield the total number of hours worked for each employee and the total charges stemming from those hours worked, sorted by employee number. The results of running that query are shown in Figure3.

Figure 3:

EMP_NUM	EMP_LNAME	SumOfASSIGN_HOURS	SumOfASSIGN_CHARGE
101	News	3.1	387.50
103	Arbough	19.7	1664.65
104	Ramoras	11.9	1218.70
105	Johnson	12.5	1382.50
108	Washington	8.3	840.15
113	Joenbrood	3.8	192.85
115	Bawangi	12.5	1276.75
117	Williamson	18.8	649.54