CPSC 3131 / MISM 4135 - Assignment 3

The **Ch07_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 **Ch07_ConstructCo** database are shown in Figure P7.1.

Figure P7.1 Structure and contents of the Ch07_ConstructCo database

Relational Diagram — **Database name: Ch07_ConstructCo**

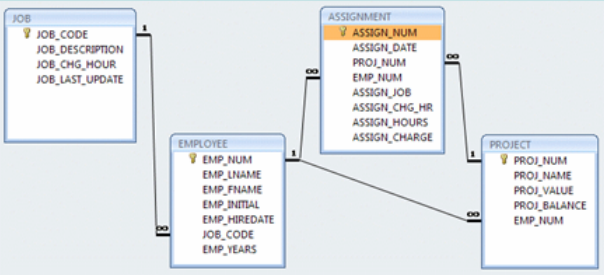

Table name: EMPLOYEE

EMP_NUM	EMP_LNAME	EMP_FNAME	EMP_INITIAL	EMP_HIREDATE	JOB_CODE	EMP_YEARS
101	News	John	G	08-Nov-00	502	12
102	Senior	David	H	12-Jul-89	501	23
103	Arbough	June	E	01-Dec-96	503	16
104	Ramoras	Anne	K	15-Nov-87	501	25
105	Johnson	Alice	K	01-Feb-93	502	19
106	Smithfield	William		22-Jun-04	500	8
107	Alonzo	Maria	D	10-Oct-93	500	19
108	Washington	Ralph	B	22-Aug-91	501	21
109	Smith	Larry	W	18-Jul-97	501	15
110	Olenko	Gerald	A	11-Dec-95	505	17
111	Wabash	Geoff	B	04-Apr-91	506	21
112	Smithson	Darlene	M	23-Oct-94	507	18
113	Joenbrood	Delbert	K	15-Nov-96	508	16
114	Jones	Annelise		20-Aug-93	508	19
115	Bawangi	Travis	B	25-Jan-92	501	20
116	Pratt	Gerald	L	05-Mar-97	510	15
117	Williamson	Angie	H	19-Jun-96	509	16
118	Frommer	James	J	04-Jan-05	510	7

Table name: JOB

JOB_CODE	JOB_DESCRIPTION	JOB_CHG_HOUR	JOB_LAST_UPDATE
500	Programmer	35.75	20-Nov-13
501	Systems Analyst	96.75	20-Nov-13
502	Database Designer	125.00	24-Mar-14
503	Electrical Engineer	84.50	20-Nov-13
504	Mechanical Engineer	67.90	20-Nov-13
505	Civil Engineer	55.78	20-Nov-13
506	Clerical Support	26.87	20-Nov-13
507	DSS Analyst	45.95	20-Nov-13
508	Applications Designer	48.10	24-Mar-14
509	Bio Technician	34.55	20-Nov-13
510	General Support	18.36	20-Nov-13

Table name: ASSIGNMENT

ASSIGN_NUM	ASSIGN_DATE	PROJ_NUM	EMP_NUM	ASSIGN_JOB	ASSIGN_CHG_HR	ASSIGN_HOURS	ASSIGN_CHARGE
1001	22-Mar-14	18	103	503	84.50	3.5	295.75
1002	22-Mar-14	22	117	509	34.55	4.2	145.11
1003	22-Mar-14	18	117	509	34.55	2.0	69.10
1004	22-Mar-14	18	103	503	84.50	5.9	498.55
1005	22-Mar-14	25	108	501	96.75	2.2	212.85
1006	22-Mar-14	22	104	501	96.75	4.2	406.35
1007	22-Mar-14	25	113	508	50.75	3.8	192.85
1008	22-Mar-14	18	103	503	84.50	0.9	76.05
1009	23-Mar-14	15	115	501	96.75	5.6	541.80
1010	23-Mar-14	15	117	509	34.55	2.4	82.92
1011	23-Mar-14	25	105	502	105.00	4.3	451.50
1012	23-Mar-14	18	108	501	96.75	3.4	328.95
1013	23-Mar-14	25	115	501	96.75	2.0	193.50
1014	23-Mar-14	22	104	501	96.75	2.8	270.90
1015	23-Mar-14	15	103	503	84.50	6.1	515.45
1016	23-Mar-14	22	105	502	105.00	4.7	493.50
1017	23-Mar-14	18	117	509	34.55	3.8	131.29
1018	23-Mar-14	25	117	509	34.55	2.2	76.01
1019	24-Mar-14	25	104	501	110.50	4.9	541.45
1020	24-Mar-14	15	101	502	125.00	3.1	387.50
1021	24-Mar-14	22	108	501	110.50	2.7	298.35
1022	24-Mar-14	22	115	501	110.50	4.9	541.45
1023	24-Mar-14	22	105	502	125.00	3.5	437.50
1024	24-Mar-14	15	103	503	84.50	3.3	278.85
1025	24-Mar-14	18	117	509	34.55	4.2	145.11

Table name: PROJECT

PROJ_NUM	PROJ_NAME	PROJ_VALUE	PROJ_BALANCE	EMP_NUM
15	Evergreen	1453500.00	1002350.00	103
18	Amber Wave	3500500.00	2110346.00	108
22	Rolling Tide	805000.00	500345.20	102
25	Starflight	2650500.00	2309880.00	107

Note that the ASSIGNMENT table in Figure P7.1 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. And, naturally, the employee primary job assignment might 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 Ch07_ConstructCo **database shown in Figure P7.1, use SQL commands to answer Problems 1–14.**

1. **Write the SQL code that will create the table structure for a table named EMP_1. This table is a subset of the EMPLOYEE table. The basic EMP_1 table structure is summarized in the table below. (Note that the JOB_CODE is the FK to JOB.)**

ATTRIBUTE (FIELD) NAME	DATA DECLARATION
EMP_NUM	CHAR(3)
EMP_LNAME	VARCHAR(15)
EMP_FNAME	VARCHAR(15)
EMP_INITIAL	CHAR(1)
EMP_HIREDATE	DATE
JOB_CODE	CHAR(3)

2 points

2. **Having created the table structure in Problem 1, write the SQL code to enter the first two rows for the table shown in Figure P7.2.**

Figure P7.2 The contents of the EMP_1 table

EMP_NUM	EMP_LNAME	EMP_FNAME	EMP_INITIAL	EMP_HIREDATE	JOB_CODE
101	News	John	G	08-Nov-00	502
102	Senior	David	H	12-Jul-89	501
103	Arbough	June	E	01-Dec-96	500
104	Ramoras	Anne	K	15-Nov-87	501
105	Johnson	Alice	K	01-Feb-93	502
106	Smithfield	William		22-Jun-04	500
107	Alonzo	Maria	D	10-Oct-93	500
108	Washington	Ralph	B	22-Aug-91	501
109	Smith	Larry	W	18-Jul-97	501

2 points

3. **Write the SQL code to change the job code to 501 for the person whose employee number (EMP_NUM) is 107. After you have completed the task, examine the results, and then reset the job code to its original value.** **1 point**

4. **Write the SQL code to delete the row for the person named William Smithfield, who was hired on June 22, 2004, and whose job code classification is 500. (*Hint*: Use logical operators to include all of the information given in this problem.)** **1 point**

5. **Write the SQL code to create a copy of EMP_1, naming the copy EMP_2. Then write the SQL code that will add the attributes EMP_PCT and PROJ_NUM to its structure. The EMP_PCT is the bonus percentage to be paid to each employee. The new attribute characteristics are:**

   EMP_PCTNUMBER(4,2)

   PROJ_NUMCHAR(3)

   (*Note*: If your SQL implementation allows it, you may use DECIMAL(4,2) rather than NUMBER(4,2).)

   2 points

6. **Write the two SQL command sequences required to:**

   a. **Create a temporary table named TEMP_1 whose structure is composed of the EMP_2 attributes EMP_NUM and EMP_PCT.**
   b. **Copy the matching EMP_2 values into the TEMP_1 table.**

   3 points

7. **Write the SQL command that will delete the newly created TEMP_1 table from the database.**

   1 point

8. **Write the SQL code required to list all employees whose last names start with *Smith*. In other words, the rows for both Smith and Smithfield should be included in the listing. Assume case sensitivity.** **1 point**

9. **Using the EMPLOYEE, JOB, and PROJECT tables in the Ch07_ConstructCo database (see Figure P7.1), write the SQL code that will produce the results shown in Figure P7.9.**

   Figure P7.9 The query results for Problem 9

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

   3 points

10. **Write the SQL code to find the average bonus percentage in the EMP_2 table you created in Problem 5.** **1 point**

11. **Write the SQL code that will produce a listing for the data in the EMP_2 table in ascending order by the bonus percentage.** **1 point**

12. **Write the SQL code that will list only the distinct project numbers found in the EMP_2 table.**

    1 point

13. **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. The results of running that query are shown in Figure P7.13.**

Figure P7.13 Total hours and charges by employee

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

2 points

14. **Write a query to produce the total number of hours and charges for each of the projects represented in the ASSIGNMENT table. The output is shown in Figure P7.14.**

Figure P7.14 Total hour and charges by project

PROJ_NUM	SumOfASSIGN_HOURS	SumOfASSIGN_CHARGE
15	20.5	1806.52
18	23.7	1544.80
22	27.0	2593.16
25	19.4	1668.16

2 points

---- End ----