Week-8 Tutorial

Advanced SQL

1. What type of integrity is enforced when a primary key is declared?
2. Explain why it might be more appropriate to declare an attribute that contains only digits as a character data type instead of a numeric data type.
3. What is a trigger, and what is its purpose? Give an example?
4. 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

Database name: Ch08_ConstructCo

Relational diagram

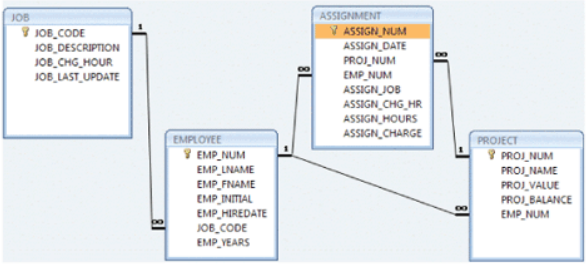

Table name: EMPLOYEE

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	500	18
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-17
501	Systems Analyst	96.75	20-Nov-17
502	Database Designer	125.00	24-Mar-18
503	Electrical Engineer	84.50	20-Nov-17
504	Mechanical Engineer	67.90	20-Nov-17
505	Civil Engineer	55.78	20-Nov-17
506	Clerical Support	26.87	20-Nov-17
507	DSS Analyst	45.95	20-Nov-17
508	Applications Designer	48.10	24-Mar-18
509	Bio Technician	34.55	20-Nov-17
510	General Support	18.36	20-Nov-17

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

Table name: ASSIGNMENT

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

Given the structure and contents of the ConstructCo database shown in Figure 1, use SQL commands to answer following exercises

a. Download the following file from Moodle: Week 8: **08_ConstructCo_MySQL.txt**

b. Import the file **08_ConstructCo_MySQL.txt** into XAMPP.

c. Write the SQL code that will create only the table structure for a table named EMP_1. This table will be a subset of the EMPLOYEE table. The basic EMP_1 table structure is summarized in the following table. Use EMP_NUM as the primary key. Note that the JOB_CODE is the FK to JOB so be certain to enforce referential integrity. Your code should also prevent null entries in EMP_LNAME and EMP_FNAME.

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)

d. Having created the table structure in 4 (c), write the SQL code to enter the first two rows for the table shown in Figure 2. Each row should be inserted individually, without using a subquery. Insert the rows in the order that they are listed in the figure.

Figure 2
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

e. Using the EMPLOYEE table that already exists, use a subquery to insert the remaining rows from the EMPLOYEE table into the EMP_1 table. Remember, your sub- query should only retrieve the columns needed for the EMP_1 table and only the employees shown in the figure.

f. Write the SQL code to change the job code to 501 for the person whose employee number (EMP_NUM) is 107.

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

h. Write the SQL code to create a copy of EMP_1, including all of its data, and naming the copy EMP_2.

i. Using the EMP_2 table, write the SQL code that will add the attributes EMP_PCT and PROJ_NUM to EMP_2. The EMP_PCT is the bonus percentage to be paid to each employee. The new attribute characteristics are:

   EMP_PCT NUMBER(4,2)
   PROJ_NUM CHAR(3)
   Note: If your SQL implementation requires it, you may use DECIMAL(4,2) or NUMERIC(4,2) rather than NUMBER(4,2).

j. Using the EMP_2 table, write the SQL code to change the EMP_PCT value to 3.85 for the person whose employee number (EMP_NUM) is 103.