CPSC 5021 In-Class Exercise (SQL)

The database below 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 database are shown below.

Table name: EMPLOYEE

EMP_NUM	EMP_LNAME	EMP_FNAME	EMP_INITIAL	EMP_HIREDATE	JOB_CODE	EMP_YEAR
101	News	John	G	2000-11-08	502	12
102	Senior	David	H	1989-07-12	501	23
103	Arbough	June	E	1996-12-01	500	16
104	Ramoras	Anne	K	1987-11-15	501	25
105	Johnson	Alice	K	1993-02-01	502	19
106	Smithfield	William	S	2004-06-22	500	8
107	Alonzo	Maria	D	1993-10-10	501	8
108	Washington	Ralph	B	1991-08-22	501	21

(Note: In table "EMPLOYEE", JOB_CODE is the foreign key that references JOB_CODE in table "JOB".)

Table name: JOB

JOB_CODE	JOB_DESCRIPTION	JOB_CHG_HOUR	JOB_LAST_UPDATE
500	Programmer	35.75	2009-11-20
501	System Analyst	96.75	2009-11-20
502	Database Designer	125.00	2010-03-24
503	Electrical Engineer	84.50	2009-11-20

Table name: ASSIGNMENT

ASSIGN_NUM	ASSIGN_DATE	PROJ_NUM	EMP_NUM	ASSIGN_JOB	ASSIGN_CHG_HR	ASSIGN_HOURS
1001	2012-03-22	18	103	500	84.50	3.5
1002	2012-03-22	18	102	501	84.50	5.9
1003	2012-03-22	25	108	501	96.75	2.2
1004	2012-03-22	22	102	501	96.75	4.2
1005	2012-03-22	18	103	500	84.50	0.9
1006	2012-03-23	25	107	501	105.00	4.3
1007	2012-03-23	18	108	501	96.75	3.4
1008	2012-03-23	22	104	501	96.75	2.8
1009	2012-03-23	15	103	500	84.50	6.1
1010	2012-03-23	22	105	502	105.00	4.7
1011	2012-03-24	25	106	500	110.50	4.9
1012	2012-03-24	15	101	502	125.00	3.1
1013	2012-03-24	22	108	501	110.50	2.7
1014	2012-03-24	22	105	502	125.00	3.5

(Note: In table "ASSIGNMENT", the foreign key is EMP_NUM, ASSIGN_JOB and PROJ_NUM. EMP_NUM references EMP_NUM in table "EMPLOYEE"; ASSIGN_JOB references JOB_CODE in table "JOB"; PROJ_NUM references PROJ_NUM in table "PROJECT".).

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	Starlight	2850500.00	2309880.00	107

(Note: EMP_NUM in this table records the ID for a project's manager. It is a foreign key which references EMP_NUM in table "EMPLOYEE")

Given the structure and contents of the database, use SQL commands to answer questions below.

(1) Write the SQL code that will create the table structures for the table EMPLOYEE, JOB, ASSIGNMENT, and PROJECT, separately. The table structures are summarized below.

EMPLOYEE

ATTRIBUTE NAME	DATA TYPE
EMP_NUM	CHAR(3)
EMP_LNAME	VARCHAR(15)
EMP_FNAME	VARCHAR(15)
EMP_INITIAL	CHAR(1)
EMP_HIREDATE	DATE
JOB_CODE	CHAR(3)
EMP_YEAR	SMALLINT

JOB

ATTRIBUTE NAME	DATA TYPE
JOB_CODE	CHAR(3)
JOB_DESCRIPTION	VARCHAR(50)
JOB_CHG_HOUR	DECIMAL(5, 2)
JOB_LAST_UPDATE	DATE

ASSIGNMENT

ATTRIBUTE NAME	DATA TYPE
ASSIGN_NUM	CHAR(4)
ASSIGN_DATE	DATE
PROJ_NUM	CHAR(2)
EMP_NUM	CHAR(3)
ASSIGN_JOB	CHAR(3)
ASSIGN_CHG_HR	DECIMAL(5, 2)
ASSIGN_HOURS	DECIMAL(3, 1)

PROJECT

ATTRIBUTE NAME	DATA TYPE
PROJ_NUM	CHAR(2)
PROJ_NAME	VARCHAR(50)
PROJ_VALUE	DECIMAL(12, 2)
PROJ_BALANCE	DECIMAL(12, 2)
EMP_NUM	CHAR(3)

(2) Write the SQL code to enter data in each table.

(3) Write the SQL code that will list all attributes in the EMPLOYEE table for a job code of 502.

(4) Write the SQL code that will list values of "PROJ_NUM""PROJ_NAME" of the PROJECT table.

(5) Write the SQL code that will list all attributes in the ASSIGNMENT table with ASSIGN_HOURS > 3

(6) Write the SQL code that will list ASSIGN_NUM, ASSIGN_DATE, ASSIGN_CHG_HR*ASSIGN_HOURS (*note: name this product as assign_charge*) in the table ASSIGNMENT with ASSIGN_DATE later than 2012-03-21.

(7) Write the SQL code that will list all attributes in the table "PROJECT" with PROJ_NUM = 22 or PROJ_NUM = 25.

(8) Write the SQL code required to list all employees whose last names start with Smith.

(9) Write the SQL code to select from the table "JOB" all jobs which job_code value appear in the EMPLOYEE table.

(10) Write the SQL code that will produce a listing for the data in the EMPLOYEE table in descending order by EMP_YEAR.

(11) Write the SQL code that will list only the distinct EMP_NUM in the table "ASSIGNMENT".

(12) Write the SQL code to find the average PROJ_VALUE in the table "PROJECT".

(13) Write the SQL code to count the number of distinct EMP_NUM in the table "ASSIGNMENT".

(14) Write the SQL code to list all attributes of the project that has the largest amount of PROJ_VALUE.

(15) Write the SQL code to list all attributes of the project(s) which PROJ_VALUE is higher than the average PROJ_VALUE. Sort the result by PROJ_BALANCE in ascending order.

(16) Write the SQL code to find the numbers of employees that each project has been assigned to.

(17) Write the SQL code to list the EMP_NUM and the number of projects s/he has been assigned to for employees who has been assigned to at least 2 projects.

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

(19) Write the SQL code to delete the row for William Smithfield, who was hired on June 22, 2004, and whose job code is 500.

(20) Write the SQL code to create a copy of EMPLOYEE, naming the copy EMP_1. 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_PCT DECIMAL(4, 2)
PROJ_NUM CHAR(3)

(21) Write the SQL code that will change the EMP_YEAR to 14 for employees who were hired before January 1, 1994, and whose job code is at least 501.