COMP810 – Data Warehousing and Big Data

Lab Exercise - Week 7

SQL Practice

Section A:

Consider the following two tables: The Product table contains two attributes, PROD_CODE and VEND_CODE. The VEND_CODE attribute in the PRODUCT table is a foreign key referencing VENDOR.

PRODUCT	
Prod_Code	Vend_Code
ABC	125
DEF	124
GHI	124
JKL	123

VENDOR
Vend_Code
123
124
125
126

Given this information, what would be the query output for each of the following questions (write both the query and the resulting rows. You need to write it on your notebook).

(i) A UNION query based on the two tables?

(ii) A UNION ALL query based on the two tables?

(iii) An INTERSECT query based on the two tables?

(iv) A MINUS query based on the two tables?

Section B

The Entity Relationship diagram including the structure and contents of a **Sale database** are given below. While the SQL script for Sale database is provided on AUTONLINE with name "SaleCo_Database". Download this file and run it to generate the following database. Use this database to answer the questions (1-7) in this section.

The Sale Company Database Structure and Contents

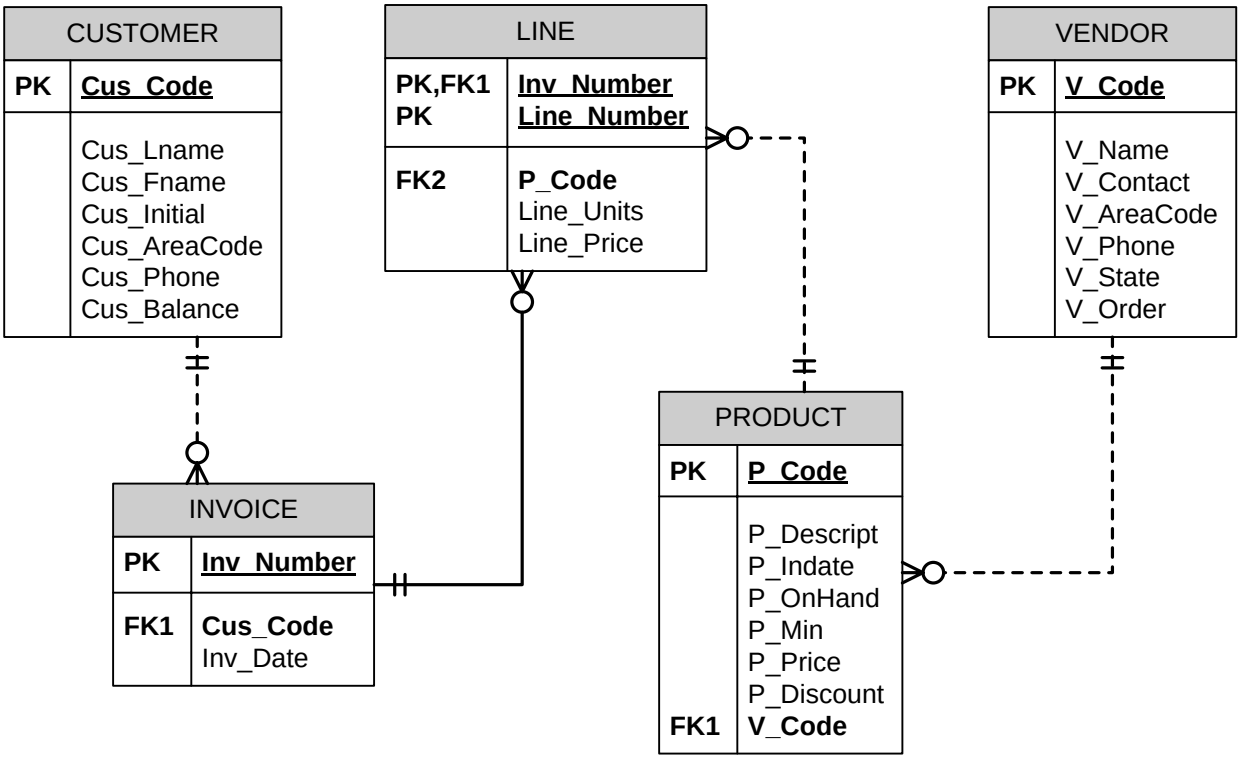


Figure 1: Sale Database

CUSTOMER

```
Name                                      Null?    Type
----------------------------------------- -------- ----------------------------
CUS_CODE                                           NUMBER
CUS_LNAME                                          VARCHAR2(15)
CUS_FNAME                                          VARCHAR2(15)
CUS_INITIAL                                        VARCHAR2(1)
CUS_AREACODE                                       VARCHAR2(3)
CUS_PHONE                                          VARCHAR2(8)
CUS_BALANCE                                        NUMBER
```

```
SELECT * FROM customer;
```

CUS_CODE	CUS_LNAME	CUS_FNAME	CUS	CUS_AREAC	CUS_PHONE	CUS_BALANCE
10010	Ramas	Alfred	A	615	844-2573	0
10011	Dunne	Leona	K	713	894-1238	0
10012	Smith	Kathy	W	615	894-2285	345.86
10013	Olowski	Paul	F	615	894-2180	536.75
10014	Orlando	Myron		615	222-1672	0
10015	O'Brian	Amy	B	713	442-3381	0
10016	Brown	James	G	615	297-1228	221.19
10017	Williams	George		615	290-2556	768.93
10018	Farriss	Anne	G	713	382-7185	216.55
10019	Smith	Olette	K	615	297-3809	0

10 rows selected.

INVOICE

Name	Null?	Type
INV_NUMBER		NUMBER
CUS_CODE		NUMBER
INV_DATE		DATE

```
SELECT * from invoice;
```

INV_NUMBER	CUS_CODE	INV_DATE
1001	10014	01/16/2008
1002	10011	01/16/2008
1003	10012	01/16/2008
1004	10011	01/17/2008
1005	10018	01/17/2008
1006	10014	01/17/2008
1007	10015	01/17/2008
1008	10011	01/17/2008

8 rows selected.

LINE

Name	Null?	Type
INV_NUMBER		NUMBER
LINE_NUMBER		NUMBER
P_CODE		VARCHAR2(10)
LINE_UNITS		NUMBER
LINE_PRICE		NUMBER

SELECT * FROM line;

INV NUMBER	LINE NUMBER	P CODE	LINE UNITS	LINE PRICE
1001	1	13-Q2/P2	1	14.99
1001	2	23109-HB	1	9.95
1002	1	54778-2T	2	4.99
1003	1	2238/QPD	1	38.95
1003	2	1546-QQ2	1	39.95
1003	3	13-Q2/P2	5	14.99
1004	1	54778-2T	3	4.99
1004	2	23109-HB	2	9.95
1005	1	PVC23DRT	12	5.87
1006	1	SM-18277	3	6.99
1006	2	2232/QTY	1	109.92
1006	3	23109-HB	1	9.95
1006	4	89-WRE-Q	1	256.99
1007	1	13-Q2/P2	2	14.99
1007	2	54778-2T	1	4.99
1008	1	PVC23DRT	5	5.87
1008	2	WR3/TT3	3	119.95
1008	3	23109-HB	1	9.95

18 rows selected.

PRODUCT

Name	Type
P_CODE	VARCHAR2(10)
P_DESCRIPT	VARCHAR2(35)
P_INDATE	DATE
P_ONHAND	NUMBER
P_MIN	NUMBER
P_PRICE	NUMBER
P_DISCOUNT	NUMBER
V_CODE	NUMBER

SELECT * from product;

P CODE	P DESCRIPT	P INDATE	P QOH	P MIN	P PRICE	P DISCOUNT	V CODE
11QER/31	Power painter, 15 psi.,3-nozzle	11/03/2007	8	5	109.99	0	25595
13-Q2/P2	7.25-in. pwr. saw blade	12/13/2007	32	15	14.99	.05	21344
14-Q1/L3	9.00-in. pwr. saw blade	11/13/2007	18	12	17.49	0	21344
1546-QQ2	Hrd. cloth, 1/4-in., 2x50	01/15/2008	15	8	39.95	0	23119
1558-QW1	Hrd. cloth, 1/2-in., 3x50	01/15/2008	23	5	43.99	0	23119
2232/QTY	B&D jigsaw, 12-in. blade	12/30/2007	8	5	109.92	.05	24288
2232/QWE	B&D jigsaw, 8-in. blade	12/24/2007	6	5	99.87	.05	24288
2238/QPD	B&D cordless drill, 1/2-in.	01/20/2008	12	5	38.95	.05	25595
23109-HB	Claw hammer	01/20/2008	23	10	9.95	.1	21225
23114-AA	Sledge hammer, 12 lb.	01/02/2008	8	5	14.4	.05	
54778-2T	Rat-tail file, 1/8-in. fine	12/15/2007	43	20	4.99	0	21344
89-WRE-Q	Hicut chain saw, 16 in.	02/07/2008	11	5	256.99	.05	24288
PVC23DRT	PVC pipe, 3.5-in., 8-ft	02/20/2008	188	75	5.87	0	
SM-18277	1.25-in. metal screw, 25	03/01/2008	172	75	6.99	0	21225
SW-23116	2.5-in. wd. screw, 50	02/24/2008	237	100	8.45	0	21231
WR3/TT3	Steel matting,4'x8'x1/6",.5"mesh	01/17/2008	18	5	119.95	.1	25595

16 rows selected.

VENDOR

```
Name                                                                    Type
 ----------------------------------------------------------------------
 V_CODE                                                                  NUMBER
 V_NAME                                                                  VARCHAR2(15)
 V_CONTACT                                                               VARCHAR2(50)
 V_AREACODE                                                              VARCHAR2(3)
 V_PHONE                                                                 VARCHAR2(8)
 V_STATE                                                                 VARCHAR2(2)
 V_ORDER                                                                 VARCHAR2(1)

SELECT * FROM vendor;
```

V_CODE	V_NAME	V_CONTACT	V_A	V_PHONE	V_STATE	V_ORDER
21225	Bryson, Inc.	Smithson	615	223-3234	TN	Y
21226	SuperLoo, Inc.	Flushing	904	215-8995	FL	N
21231	D&E Supply	Singh	615	228-3245	TN	Y
21344	Gomez Bros.	Ortega	615	889-2546	KY	N
22567	Dome Supply	Smith	901	678-1419	GA	N
23119	Randsets Ltd.	Anderson	901	678-3998	GA	Y
24004	Brackman Bros.	Browning	615	228-1410	TN	N
24288	ORDVA, Inc.	Hakford	615	898-1234	TN	Y
25443	B&K, Inc.	Smith	904	227-0093	FL	N
25501	Damal Supplies	Smythe	615	890-3529	TN	N
25595	Rubicon Systems	Orton	904	456-0092	FL	Y

11 rows selected.

1. Write a query to count the number of customers with a customer balance over $500.

2. Write a query to list all products (only columns Product code and Description should be displayed) for which no vendor code has been specified.

3. Write a query to list all customers (first name, last name, and phone) whose first name starts with ‘A’. sort the results alphabetically by first name.

4. Create a query to find the customer balance characteristics for all customers, including the total of the outstanding balances. The results of this query are shown below.

Total Balance	Minimum Balance	Maximum Balance	Average Balance
2089.28	**0**	**768.93**	**208.93**

5. Generate a listing of all purchases made by the customers, using the output shown in Table (5) as your guide. The sorting of the resulting rows should also be based on the following output.

TABLE 5 List of Customer Purchases

CUS_CODE	INV_NUM	INV_DATE	P_DESCRIPT	LINE_UNITS	LINE_PRICE
10011	1002	16-JAN-08	Rat-tail file, 1/8-in. fine	2	4.99
10011	1004	17-JAN-08	Claw hammer	2	9.95
10011	1004	17-JAN-08	Rat-tail file, 1/8-in. fine	3	4.99
10011	1008	17-JAN-08	Claw hammer	1	9.95
10011	1008	17-JAN-08	PVC pipe, 3.5-in., 8-ft	5	5.87
10011	1008	17-JAN-08	Steel matting, 4'x8'x1/6", .5" mesh	3	119.95
10012	1003	16-JAN-08	7.25-in. pwr. saw blade	5	14.99
10012	1003	16-JAN-08	B&D cordless drill, 1/2-in.	1	38.95
10012	1003	16-JAN-08	Hrd. cloth, 1/4-in., 2x50	1	39.95
10014	1001	16-JAN-08	7.25-in. pwr. saw blade	1	14.99
10014	1001	16-JAN-08	Claw hammer	1	9.95
10014	1006	17-JAN-08	1.25-in. metal screw, 25	3	6.99
10014	1006	17-JAN-08	B&D jigsaw, 12-in. blade	1	109.92
10014	1006	17-JAN-08	Claw hammer	1	9.95
10014	1006	17-JAN-08	Hicut chain saw, 16 in.	1	256.99
10015	1007	17-JAN-08	7.25-in. pwr. saw blade	2	14.99
10015	1007	17-JAN-08	Rat-tail file, 1/8-in. fine	1	4.99
10018	1005	17-JAN-08	PVC pipe, 3.5-in., 8-ft	12	5.87

18 rows selected.

6. Using the output shown in Table 6 as your guide, create a query to produce the total purchase per invoice, i.e, you should generate the listing of total invoice value for each invoice in the LINE table. The output should include only invoices where the total invoice value is greater than 100. The output should be formatted as shown in Table 6.

Table 6: Summary of Customer Purchases with subtotals

INVOICE	$Total Value
1003	153.85
1006	397.83
1008	399.15

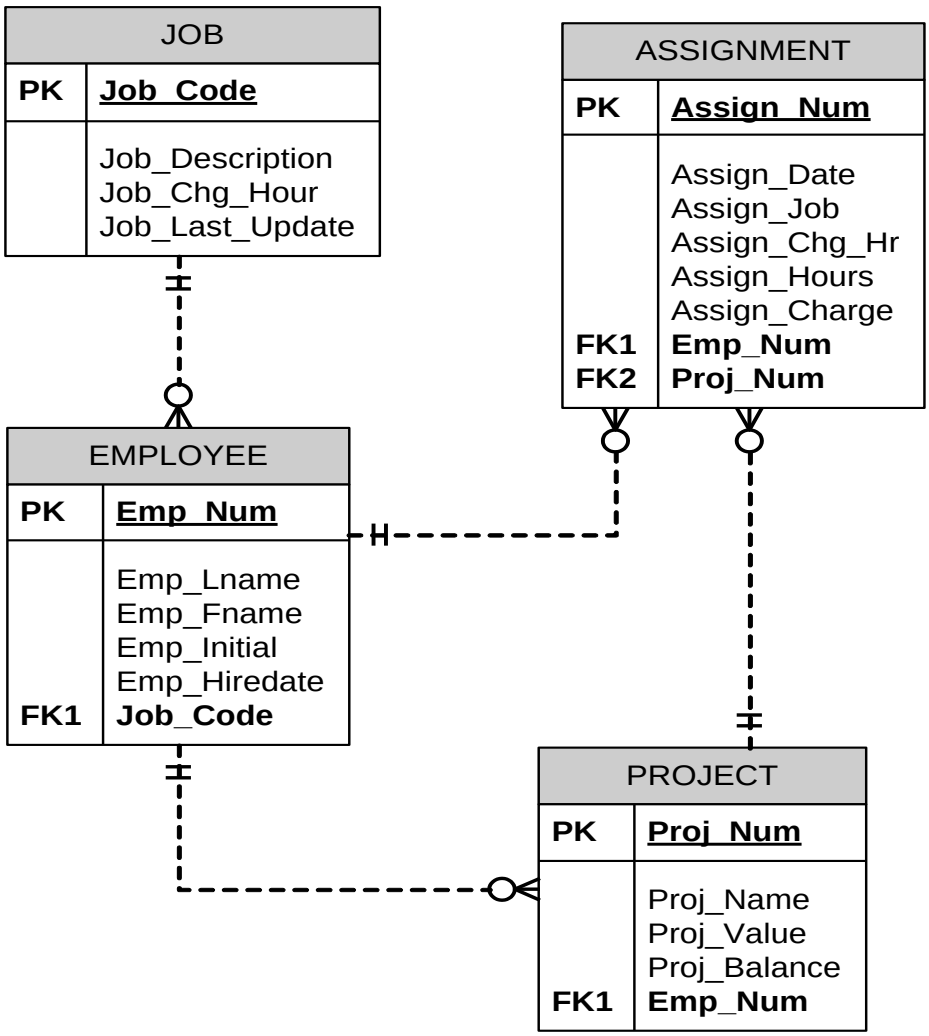
7. Use a SET operator to list all customer codes who have not made any purchases- i.e, there are no invoices generated for these customers. The resulting rows are shown below.

CUS_CODE
10010
10013
10016
10017
10019

Section C

The **Review 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 Review database are shown in Figure 2. While the SQL script for Review database is provided on AUTONLINE with name "Review_Database". Download this file and run it to generate the following database.
Use this database to answer the questions 1–8.

FIGURE 2 Structure and Contents of the Review Database



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 Table C1. (Note that the JOB_CODE is the FK to JOB.)

Table C1 The EMP_1 Table Structure

ATTRIBUTE (FIELD) NAME	DATA TYPE
EMP_NUM	CHAR(3)
EMP_LNAME	VARCHAR(15)
EMP_FNAME	VARCHAR(15)
EMP_INITIAL	CHAR(1)
EMP_HIREDATE	DATE
JOB_CODE	VARCHAR2(3)

2. Having created the table structure in Question 1, write the SQL code to enter the first two rows for the table shown in Figure C2.

FIGURE C2 The Contents of the EMP_1 Table

EMP_NUM	EMP_LNAME	EMP_FNAME	EMP	EMP_HIREDA	JOB_CODE	EMP_YEARS
101	News	John	G	11/08/2000	502	4
102	Senior	David	H	07/12/1989	501	15
103	Arbough	June	E	12/01/1996	503	8
104	Ramoras	Anne	K	11/15/1987	501	17
105	Johnson	Alice	K	02/01/1993	502	12
106	Smithfield	William		06/22/2004	500	0
107	Alonzo	Maria	D	10/10/1993	500	11
108	Washington	Ralph	B	08/22/1991	501	13
109	Smith	Larry	W	07/18/1997	501	7

3. Assuming that the data shown in the EMP_1 table have been entered, write the SQL code that will list all attributes for a job code of 502.

4. Write the SQL code that will save the changes made to the EMP_1 table.

5. Write the SQL code to change the job code to 501 for the person whose employee number is 107. After you have completed the task, examine the results, and then reset the job code to its original value.

6. 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 the information given in this problem.)

7. Write the SQL code that will restore the data to its original status; that is, the table should contain the data that existed before you made the changes in Questions 5 and 6.

8. 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_PCT	**NUMBER(4,2)**
PROJ_NUM	**CHAR(3)10**