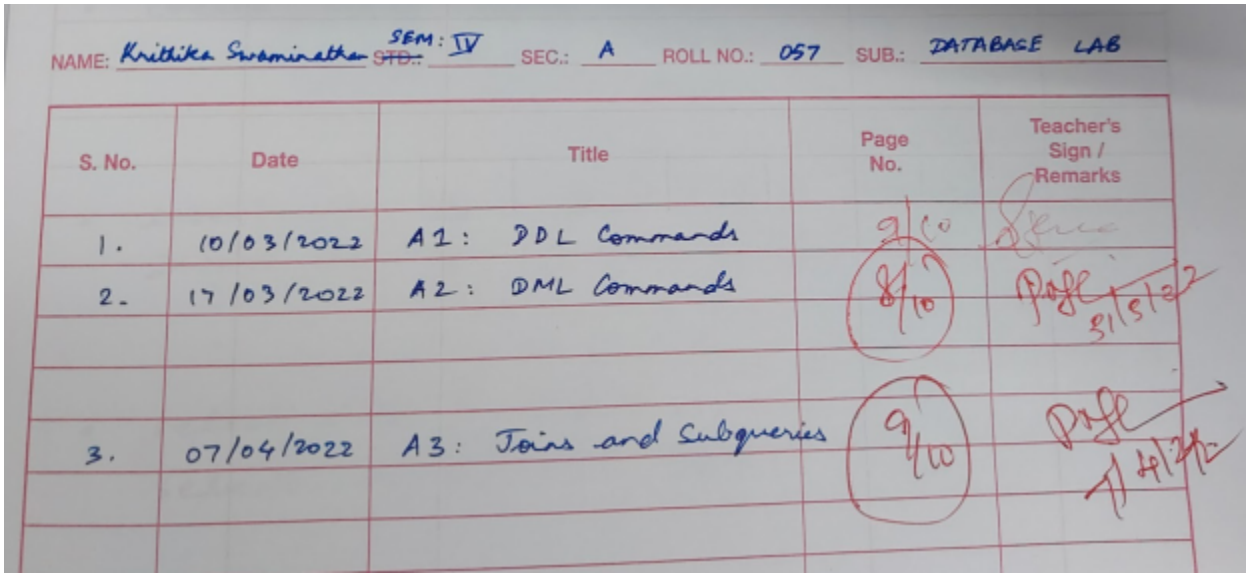
Assignment 3 – Joins and SubQueries

Validation:



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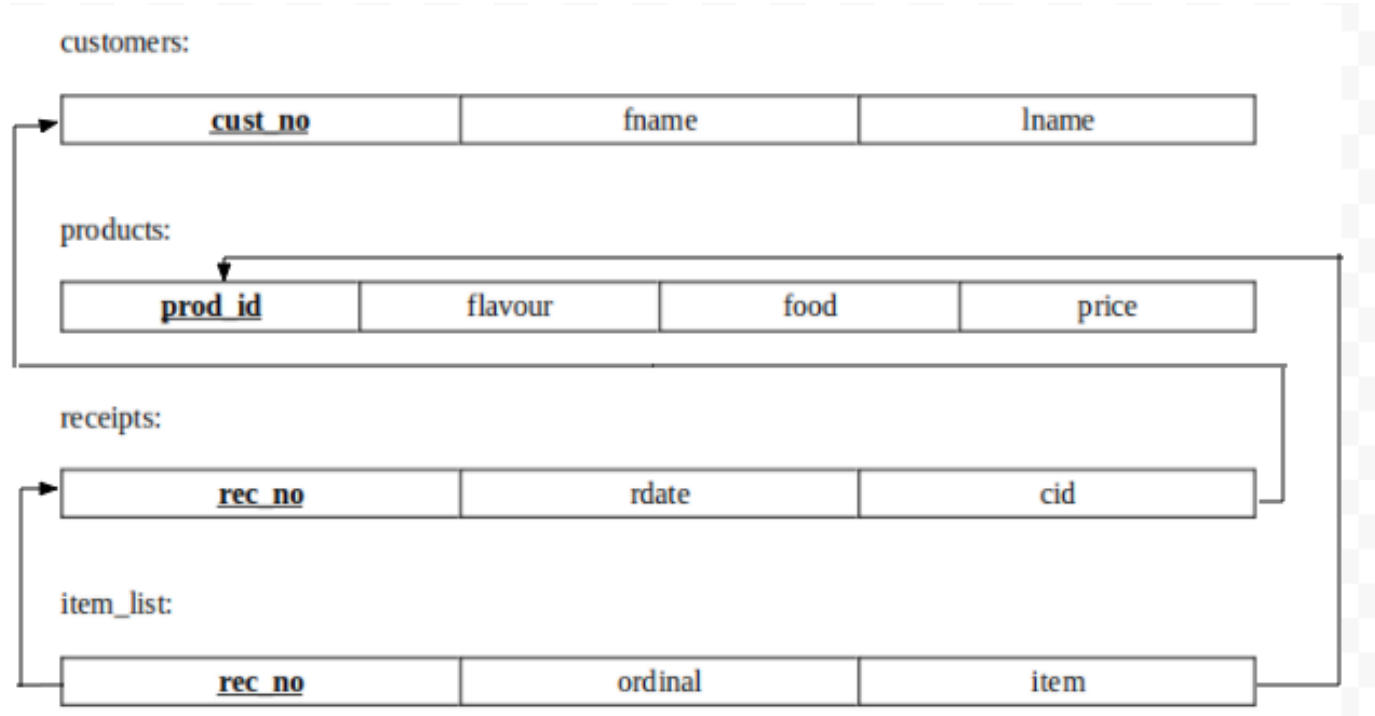
S. No.	Date	Title	Page No.	Teacher's Sign / Remarks
1.	10/03/2022	A1: DDL Commands	9/10	
2.	17/03/2022	A2: DML Commands	8/10	Prof 31/5/22
3.	07/04/2022	A3: Joins and Subqueries	9/10	Prof 7/4/22

Schema diagram:



Data file:

```
SQL> @C:/Krithika/DBL/a3data.sql;
SQL> REM Assignment 3
SQL> REM Population of Bakery Database
SQL> REM ------------------------------------------------------------------------
> REM CUSTOMERS ( customer number,  Last name, First name)
SQL> REM ------------------------------------------------------------------------
>
SQL> drop table item_list;

Table dropped.

SQL> drop table receipts;

Table dropped.

SQL> drop table products;

Table dropped.

SQL> drop table customers;

Table dropped.

SQL>
SQL> create table customers(
  2         cust_no number(2) constraint c_pk primary key,
  3         lname varchar2(20),
  4         fname varchar2(20)
  5         );

Table created.

SQL>
SQL> insert into customers values(1, 'LOGAN', 'JULIET');

1 row created.

.
.
.

SQL> insert into customers values(21, 'JOHN', 'DAVID');

1 row created.

SQL>
SQL> REM ------------------------------------------------------------------------
> REM PRODUCTS (product number,  Flavor, Food, Price)
```

```
SQL> REM ------------------------------------------------------------------------
>
SQL> create table products(
  2         prod_id varchar2(20) constraint prod_pk primary key,
  3         flavour varchar2(20),
  4         food varchar2(20),
  5         price number
  6         );

Table created.

SQL>
SQL> insert into products values('20-BC-C-10','Chocolate','Cake',8.95);

1 row created.

.
.
.

SQL> insert into products values('51-BLU','Blueberry','Danish',1.15);

1 row created.

SQL>
SQL> REM ------------------------------------------------------------------------
> REM RECEIPTS(receipt number, receipt Date, Customer)
SQL> REM ------------------------------------------------------------------------
>
SQL> create table receipts(
  2         rec_no number(5) constraint rec_pk primary key,
  3         rdate date,
  4         cid number(2) constraint rec_fk references customers(cust_no)
  5         );

Table created.

SQL>
SQL> INSERT INTO Receipts values(18129, '28-Oct-2007', 15);

1 row created.

.
.
.

SQL> INSERT INTO Receipts values(34378, '23-Oct-2007', 6);

1 row created.
```

```
SQL>
SQL> REM ------------------------------------------------------------------------
> REM ITEM_LIST (receipt number,  Ordinal, Item)
SQL> REM ------------------------------------------------------------------------
>
SQL> create table item_list(
  2         rec_no number(5) constraint it_fk1 references receipts(rec_no),
  3         ordinal number(2),
  4         item varchar2(20) constraint it_fk2 references products(prod_id),
  5         constraint item_pk primary key(rec_no,ordinal)
  6         );

Table created.

SQL>
SQL> insert into item_list values(18129, 1,  '70-TU');

1 row created.

.
.
.

SQL> insert into item_list values(34378, 2,  '45-VA');

1 row created.

SQL>
SQL> REM *** End of database population ***
SQL>
SQL>
SQL> REM *** Checking tables ***
SQL>
SQL> select * from customers;

   CUST_NO LNAME              FNAME
---------- -------------------- --------------------
         1 LOGAN                JULIET
         2 ARZT                TERRELL
         3 ESPOSITA             TRAVIS
         4 ENGLEY              SIXTA
         5 DUNLOW               OSVALDO
         6 SLINGLAND            JOSETTE
         7 TOUSSAND            SHARRON
         8 HELING              RUPERT
         9 HAFFERKAMP           CUC
        10 DUKELOW             CORETTA
        11 STADICK             MIGDALIA

   CUST_NO LNAME              FNAME
```

---------- -------------------- --------------------
12 MCMAHAN MELLIE
13 ARNN KIP
14 SOPKO RAYFORD
15 CALLENDAR DAVID
16 CRUZEN ARIANE
17 MESDAQ CHARLENE
18 DOMKOWSKI ALMETA
19 STENZ NATACHA
20 ZEME STEPHEN
21 JOHN DAVID

21 rows selected.

SQL> select * from products;

PROD_ID	FLAVOUR	FOOD	PRICE
20-BC-C-10	Chocolate	Cake	8.95
20-BC-L-10	Lemon	Cake	8.95
20-CA-7.5	Casino	Cake	15.95
24-8x10	Opera	Cake	15.95
25-STR-9	Strawberry	Cake	11.95
26-8x10	Truffle	Cake	15.95
45-CH	Chocolate	Eclair	3.25
45-CO	Coffee	Eclair	3.5
45-VA	Vanilla	Eclair	3.25
46-11	Napoleon	Cake	13.49
90-ALM-I	Almond	Tart	3.75

PROD_ID	FLAVOUR	FOOD	PRICE
90-APIE-10	Apple	Pie	5.25
90-APP-11	Apple	Tart	3.25
90-APR-PF	Apricot	Tart	3.25
90-BER-11	Berry	Tart	3.25
90-BLK-PF	Blackberry	Tart	3.25
90-BLU-11	Blueberry	Tart	3.25
90-CH-PF	Chocolate	Tart	3.75
90-CHR-11	Cherry	Tart	3.25
90-LEM-11	Lemon	Tart	3.25
90-PEC-11	Pecan	Tart	3.75
70-GA	Ganache	Cookie	1.15

PROD_ID	FLAVOUR	FOOD	PRICE
70-GON	Gongolais	Cookie	1.15
70-R	Raspberry	Cookie	1.09
70-LEM	Lemon	Cookie	.79
70-M-CH-DZ	Chocolate	Meringue	1.25

70-M-VA-SM-DZ Vanilla Meringue 1.15
70-MAR Marzipan Cookie 1.25
70-TU Tuile Cookie 1.25
70-W Walnut Cookie .79
50-ALM Almond Croissant 1.45
50-APP Apple Croissant 1.45
50-APR Apricot Croissant 1.45

PROD_ID	FLAVOUR	FOOD	PRICE
50-CHS	Cheese	Croissant	1.75
50-CH	Chocolate	Croissant	1.75
51-APR	Apricot	Danish	1.15
51-APP	Apple	Danish	1.15
51-ATW	Almond	Twist	1.15
51-BC	Almond	Bear Claw	1.95
51-BLU	Blueberry	Danish	1.15

40 rows selected.

SQL> select * from receipts;

REC_NO	RDATE	CID
18129	28-OCT-07	15
51991	17-OCT-07	14
83085	12-OCT-07	7
70723	28-OCT-07	20
13355	19-OCT-07	7
52761	27-OCT-07	8
99002	13-OCT-07	20
58770	22-OCT-07	18
84665	10-OCT-07	6
55944	16-OCT-07	19
42166	14-OCT-07	8

REC_NO	RDATE	CID
16034	10-OCT-07	4
25906	29-OCT-07	15
27741	25-OCT-07	8
64451	10-OCT-07	11
41028	06-OCT-07	17
73716	29-OCT-07	18
76667	14-OCT-07	15
21040	03-OCT-07	6
48332	15-OCT-07	20
35011	10-OCT-07	20
95962	26-OCT-07	8

...
...
...

REC_NO	RDATE	CID
46674	29-OCT-07	15
67946	18-OCT-07	7
31233	20-OCT-07	13
15904	06-OCT-07	13
17488	20-OCT-07	6
97097	23-OCT-07	9
50512	27-OCT-07	8
11548	21-OCT-07	13
29908	14-OCT-07	13
20127	07-OCT-07	15
41963	29-OCT-07	8

REC_NO	RDATE	CID
16532	21-OCT-07	4
34378	23-OCT-07	6

200 rows selected.

SQL> select * from item_list;

REC_NO	ORDINAL	ITEM
18129	1	70-TU
51991	1	90-APIE-10
51991	2	90-CH-PF
51991	3	90-APP-11
51991	4	26-8x10
83085	1	25-STR-9
83085	2	24-8x10
83085	3	90-APR-PF
83085	4	51-ATW
83085	5	26-8x10
70723	1	45-CO

...
...
...

REC_NO	ORDINAL	ITEM
41963	2	90-CH-PF
16532	1	50-APP
16532	2	70-MAR

```
     16532         3 70-TU
     16532         4 24-8x10
     34378         1 90-CHR-11
     34378         2 45-VA

557 rows selected.

SQL>
SQL> REM ********************* END OF DATA FILE ************************
```

Script file:

```
SQL> @C:/Krithika/DBL/a3queries.sql;
SQL> REM Assignment 3
SQL>
SQL> REM ------------------------------------------------------------------------
> REM *** ASSIGNMENT QUESTIONS ***
SQL> REM ------------------------------------------------------------------------
>
SQL> REM **I**_____Write the following using sub-queries: _____**
SQL>
SQL> REM 1. Display the food details that is not purchased by any of customers.
SQL>
SQL> select * from products where prod_id not in (select item from item_list);

PROD_ID            FLAVOUR            FOOD                 PRICE
------------------- ------------------- ------------------- ----------
20-BC-C-10         Chocolate          Cake                 8.95


SQL>
SQL>
SQL> REM 2. Show the customer details who had placed more than 2 orders on the same date.
SQL>
SQL> select * from customers where cust_no in (select cid from receipts group by cid,rdate having
count(rec_no)>2) order by cust_no;

   CUST_NO LNAME              FNAME
---------- ------------------- --------------------
         8 HELING              RUPERT
        14 SOPKO               RAYFORD

SQL>
SQL>
SQL> REM 3. Display the products details that has been ordered maximum by the customers. (use
ALL)
SQL>
SQL> select * from products where prod_id in (select item from item_list group by item having
count(item)>= all(select max(count(item)) from item_list group by item));
```

```
PROD_ID            FLAVOUR            FOOD                 PRICE
------------------- ------------------- ------------------- ----------
90-APP-11          Apple              Tart                 3.25

SQL>
SQL>
SQL> REM 4. Show the number of receipts that contain the product whose price is more than the
average price of its food type.
SQL>
SQL> select count(distinct(rec_no)) as no_of_receipts from item_list where item in (select prod_id
from products p where price> any (select avg(price) from products group by food having p.food =
food));

NO_OF_RECEIPTS
--------------
         137


SQL>
SQL>
SQL>
SQL> REM **II**_____Write the following using JOIN: (Use sub-query if required)_____**
SQL>
SQL>
SQL> REM 5. Display the customer details along with receipt number and date for the receipts that
are dated on the last day of the receipt month.
SQL>
SQL> select c.cust_no, c.fname, c.lname, r.rec_no, r.rdate from receipts r join customers c on
(c.cust_no = r.cid) where r.rdate = last_day(r.rdate);

  CUST_NO FNAME              LNAME                REC_NO RDATE
---------- ------------------- ------------------- ---------- ---------
         1 JULIET             LOGAN                85858 31-OCT-07
         3 TRAVIS             ESPOSITA             39829 31-OCT-07
        11 MIGDALIA           STADICK              60270 31-OCT-07
        12 MELLIE             MCMAHAN              70796 31-OCT-07
        19 NATACHA            STENZ                36343 31-OCT-07
        20 STEPHEN            ZEME                 49845 31-OCT-07

6 rows selected.

SQL>
SQL>
SQL> REM 6. Display the receipt number(s) and its total price for the receipt(s) that contain Twist
as one among five items. Include only the receipts with total price more than $25.
SQL>
SQL> select rec_no, sum(price) from item_list
  2  join receipts using (rec_no)
  3  join products on (prod_id = item)
```

```
  4  where rec_no in
  5          (select rec_no from item_list join products on (prod_id = item)
  6          where food = 'Twist' group by rec_no)
  7  group by rec_no having sum(price)>25 and count(*)=5;

    REC_NO SUM(PRICE)
---------- ----------
     83085      48.25
     64477      25.35
     17729      25.55

SQL>
SQL>
SQL> REM 7. Display the details (customer details, receipt number, item) for the product that was
purchased by the least number of customers.
SQL>
SQL> select i.item, rec_no, p.flavour, p.food, c.cust_no, c.fname, c.lname
  2  from item_list i
  3  join receipts r using (rec_no)
  4  join customers c on (c.cust_no = r.cid)
  5  join products p on (p.prod_id = i.item)
  6  where i.item in (
  7          select item from item_list group by item having count(item) in (
  8                  select min(count(item)) from item_list group by item
  9                  )
 10          );

ITEM                 REC_NO FLAVOUR           FOOD
-------------------- ---------- ------------------- --------------------
  CUST_NO FNAME              LNAME
---------- -------------------- --------------------
50-CH                 73716 Chocolate         Croissant
       18 ALMETA              DOMKOWSKI

50-CH                 95962 Chocolate         Croissant
        8 RUPERT              HELING

50-CH                 99994 Chocolate         Croissant
        6 JOSETTE             SLINGLAND


ITEM                 REC_NO FLAVOUR           FOOD
-------------------- ---------- ------------------- --------------------
  CUST_NO FNAME              LNAME
---------- -------------------- --------------------
50-CH                 82056 Chocolate         Croissant
       18 ALMETA              DOMKOWSKI

50-CH                 77032 Chocolate         Croissant
       14 RAYFORD             SOPKO
```

```
50-CH                49845 Chocolate          Croissant
      20 STEPHEN           ZEME


6 rows selected.

SQL>
SQL>
SQL> REM 8. Display the customer details along with the receipt number who ordered all the
flavors of Meringue in the same receipt.
SQL>
SQL> select cust_no, fname, lname, rec_no from customers
  2  join receipts on (cust_no = cid)
  3  where rec_no in (
  4           select rec_no from item_list join products p on (prod_id = item)
  5           where flavour in (select flavour from products where food='Meringue') and
food='Meringue'
  6           group by rec_no having count(distinct(flavour))=(select count(*) from products where
food='Meringue')
  7           );

   CUST_NO FNAME              LNAME                REC_NO
---------- -------------------- -------------------- ----------
       8 RUPERT             HELING               61797

SQL>
SQL>
SQL>
SQL> REM **III**_____Write the following using Set Operations: _____**
SQL>
SQL> REM 9. Display the product details of both Pie and BEAR CLAW.
SQL> REM UNION
SQL>
SQL> (select * from products where food='Pie') union (select * from products where food='Bear
Claw');

PROD_ID            FLAVOUR            FOOD                 PRICE
-------------------- -------------------- -------------------- ----------
51-BC              Almond             Bear Claw              1.95
90-APIE-10         Apple              Pie                    5.25

SQL>
SQL>
SQL> REM 10. Display the customers details who have not placed any orders.
SQL> REM DIFF OF SETS
SQL>
SQL> select * from customers where cust_no in (
  2           (select cust_no from customers) minus (select cid from receipts)
  3           );
```

```
  CUST_NO LNAME                FNAME
--------- -------------------- --------------------
       21 JOHN                 DAVID


SQL>
SQL>
SQL> REM 11. Display the food that has the same flavor as that of the common flavor between the
Meringue and Tart.
SQL> REM INTERSECTION
SQL>
SQL> select food from products where flavour in (
  2         (select flavour from products where food='Meringue')
  3         intersect
  4         (select flavour from products where food='Tart')
  5         );

FOOD
--------------------
Cake
Eclair
Tart
Meringue
Croissant


SQL> REM ********** END OF FILE **********
```