Name: Maha Vajeeshwaran Navaneethan

Lab assignment # 3- Data Retrieval Language, SELECT from several logical linked tables

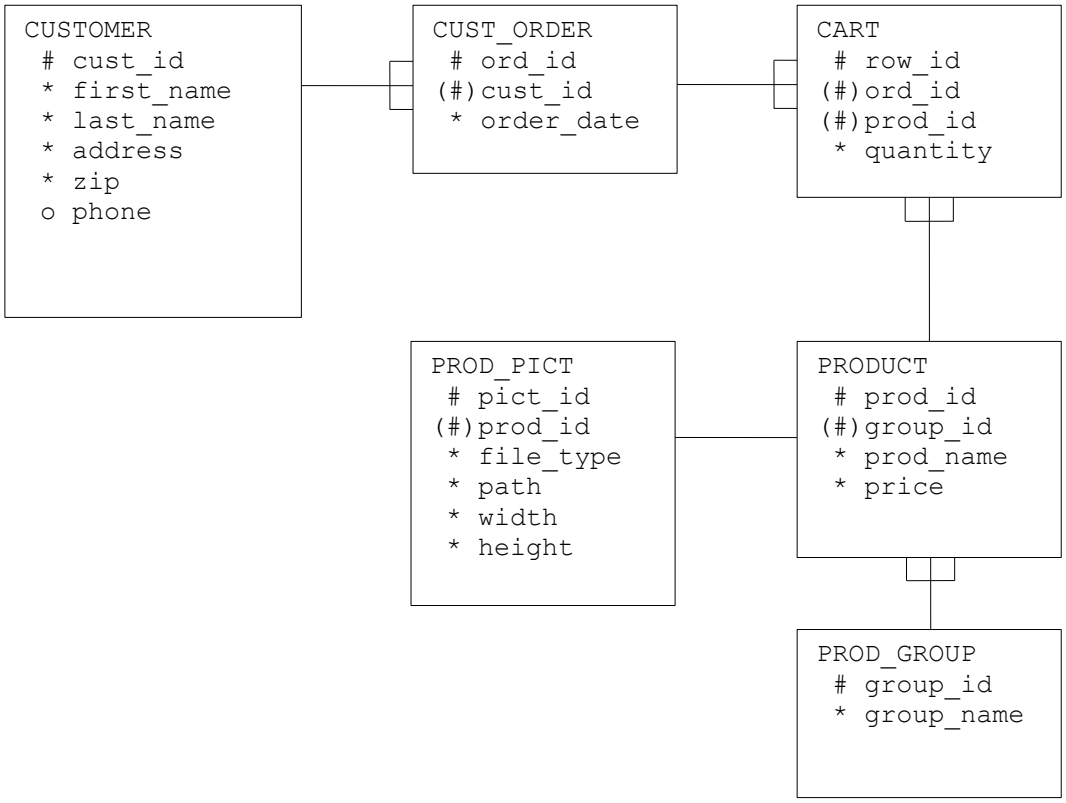
In this lab you will work with SELECT statements against several logical linked tables.

Create the tables for this lab

```
------------------Create tables START COPY-----------------------------------------------
CREATE TABLE customer(
cust_id NUMBER(6) PRIMARY KEY,
first_name VARCHAR2(20),
last_name VARCHAR2(25),
address VARCHAR2(30),
zip_code VARCHAR2(8),
city VARCHAR2(20),
area_code VARCHAR2(6),
telephone VARCHAR2(12));
CREATE TABLE cust_order(
ord_id NUMBER(9) PRIMARY KEY,
cust_id REFERENCES customer(cust_id),
order_date DATE);
CREATE TABLE prod_group(
group_id NUMBER(4) PRIMARY KEY,
group_name VARCHAR2(30));
CREATE TABLE product(
prod_id NUMBER(8) PRIMARY KEY,
group_id REFERENCES prod_group(group_id),
prod_name VARCHAR2(25),
price NUMBER(9,2));
CREATE TABLE cart(
row_id NUMBER(9) PRIMARY KEY,
ord_id REFERENCES cust_order(ord_id),
prod_id REFERENCES product(prod_id),
quantity NUMBER(6));
CREATE TABLE prod_pict(
pict_id NUMBER(9) PRIMARY KEY,
prod_id REFERENCES product(prod_id),
file_type VARCHAR2(5),
path VARCHAR2(80),
width NUMBER(4),
height NUMBER(4));
------------------Create tables END COPY-------------------------------------------------
```

Now we have a table structure representing some kind of sales activities. If you look at the next page you will see a data model of the tables with primary- and foreign keys.

Data model



Explanation of notation

```
 #   = Primary key
(#)  = Foreign key
 *   = Mandatory (must contain a value => NOT NULL)
 o   = Optional (must not contain a value can be NULL)
```

Next step is to fill the tables with data. Do that by copy and paste the following into SQL Live, and hit Run.

```
------------------Fill the tables with data START COPY---------------------------------
INSERT INTO customer VALUES(1,'olof','andersson','box144','79100','falun','023','225478');
INSERT INTO customer VALUES(2,'maria','andersson','storgatan
23',79123,'falun','023','445599');
INSERT INTO customer VALUES(3,'tomas','kvist','box1','54784','gagnef','0246','11122');
INSERT INTO customer VALUES(4,'hans','rosenboll','sommarvagen
36','78458','borlange','0243','228869');
INSERT INTO customer VALUES(5,'yvette','porpoix','sadelgatan
10','79100','falun','023','147858');
INSERT INTO customer
VALUES(6,'gustav','moller','box33','78547','gustafs','0243','122099');
INSERT INTO customer VALUES(7,'zoltan','habbervic','paradisvagen
12','78523','borlange','0243','45877');
INSERT INTO customer VALUES(8,'lena','larsson','sandgatan
13','73100','sater','0225','43251');
INSERT INTO customer VALUES(9,'ollas','bullas','korkhuvudvagen
1','79100','falun','023','11477');
INSERT INTO customer VALUES(10,'roger','nyberg','soldatvagen
25','79100','falun','023','225499');
INSERT INTO cust_order VALUES(100,1,TO_DATE('2001-02-14','YYYY-MM-DD'));
INSERT INTO cust_order VALUES(101,4,TO_DATE('2001-02-14','YYYY-MM-DD'));
INSERT INTO cust_order VALUES(289,4,TO_DATE('2003-03-04','YYYY-MM-DD'));
INSERT INTO cust_order VALUES(125,2,TO_DATE('2001-05-24','YYYY-MM-DD'));
INSERT INTO cust_order VALUES(147,3,TO_DATE('2001-12-11','YYYY-MM-DD'));
INSERT INTO cust_order VALUES(152,5,TO_DATE('2001-12-15','YYYY-MM-DD'));
INSERT INTO cust_order VALUES(458,6,TO_DATE('2004-05-08','YYYY-MM-DD'));
INSERT INTO cust_order VALUES(489,6,TO_DATE('2004-06-10','YYYY-MM-DD'));
INSERT INTO cust_order VALUES(324,10,TO_DATE('2003-08-22','YYYY-MM-DD'));
INSERT INTO cust_order VALUES(198,9,TO_DATE('2002-01-12','YYYY-MM-DD'));
INSERT INTO cust_order VALUES(348,1,TO_DATE('2004-07-17','YYYY-MM-DD'));
INSERT INTO prod_group VALUES(1,'beard care');
INSERT INTO prod_group VALUES(2,'hunting');
INSERT INTO prod_group VALUES(3,'farmhouse');
INSERT INTO prod_group VALUES(4,'leisure');
INSERT INTO product VALUES(1434,1,'trimmer deluxe',189.50);
INSERT INTO product VALUES(1724,1,'fungicides',198.5);
INSERT INTO product VALUES(113,2,'hatchet',795);
INSERT INTO product VALUES(1447,2,'knife',349.5);
INSERT INTO product VALUES(5896,3,'pig feed',240);
INSERT INTO product VALUES(5542,3,'potato fertilizer',128);
INSERT INTO product VALUES(1333,4,'dartboard',49.50);
INSERT INTO product VALUES(1888,4,'peasant trap',788.50);
INSERT INTO product VALUES(1141,4,'hammock',181.50);
INSERT INTO prod_pict VALUES(1,1434,'jpg','/images/1/',480,640);
INSERT INTO prod_pict VALUES(2,113,'jpg','/images/2/',480,640);
INSERT INTO prod_pict VALUES(3,5896,'jpg','/images/3/',480,640);
INSERT INTO prod_pict VALUES(4,1888,'gif','/images/4/',480,640);
INSERT INTO cart VALUES(1,100,1141,1);
INSERT INTO cart VALUES(2,101,1434,3);
INSERT INTO cart VALUES(3,101,1724,4);
INSERT INTO cart VALUES(4,289,1434,1);
INSERT INTO cart VALUES(5,289,1724,5);
INSERT INTO cart VALUES(6,125,1333,1);
INSERT INTO cart VALUES(7,125,1141,1);
INSERT INTO cart VALUES(8,147,5896,4);
INSERT INTO cart VALUES(9,147,5542,4);
INSERT INTO cart VALUES(10,152,113,2);
INSERT INTO cart VALUES(11,458,5896,3);
INSERT INTO cart VALUES(12,458,1447,1);
INSERT INTO cart VALUES(13,489,5542,3);
INSERT INTO cart VALUES(14,324,113,3);
INSERT INTO cart VALUES(15,324,1447,3);
INSERT INTO cart VALUES(16,324,1888,1);
INSERT INTO cart VALUES(17,198,1141,7);
INSERT INTO cart VALUES(18,348,113,3);
COMMIT;
------------------ Fill the tables with data END COPY-----------------------------------
```

Answer the following questions by writing appropriate SQL statements.

Task 1

Show **cust_id**, **first_name**, **last_name** and the **number** of customer orders that each customer has in the system.

```
-- TASK 1

SELECT s.cust_id, s.first_name, s.last_name, count(e.cust_id)
NUMBER_OF_ORDERS
FROM CUSTOMER s, CUST_ORDER e
WHERE s.cust_id = e.cust_id
GROUP BY s.cust_id, s.first_name, s.last_name
ORDER BY cust_id;
```

Correct answer:

```
CUST_ID  FIRST_NAME LAST_NAME      NUMBER_OF_ORDERS
-------  ---------- -------------- ----------------
      1  olof       andersson                    2
      2  maria      andersson                    1
      3  tomas      kvist                        1
      4  hans       rosenboll                    2
      5  yvette     porpoix                      1
      6  gustav     moller                       2
      9  ollas      bullas                       1
     10  roger      nyberg                       1
```

Task 2

Show **cust_id**, **first_name**, **last_name** for those customers who have bought products that belong to the product groups: 'farmhouse' and 'beard care'. **Solve this task by using nested search** (i.e. using sub queries)

```
-- TASK 2
SELECT cust_id, first_name, last_name
FROM Customer
WHERE cust_id in (SELECT cust_id
                  FROM CUST_ORDER
                  WHERE ord_id in
                        (SELECT ord_id
                         FROM CART
                         WHERE prod_id in
                              (SELECT PROD_ID
                               FROM PRODUCT
                               WHERE group_id IN
                                  (SELECT group_id
                                  FROM PROD_GROUP
                                  WHERE group_name = 'farmhouse' OR
group_name = 'beard care'))))
ORDER by cust_id;
```

Correct answer:

```
CUST_ID FIRST_NAME           LAST_NAME
------- -------------------- ---------
      3 tomas                kvist
      4 hans                 rosenboll
      6 gustav               moller
```

Task 3

Show **cust_id**, **first_name**, **last_name** for those customers who have bought products that belong to the product groups: 'farmhouse' and 'beard care'. **Solve this task by using join search** (i.e. using equi-join)

```
-- TASK 3

SELECT c.cust_id, c.first_name, c.last_name
FROM CUSTOMER c, CUST_ORDER o, CART ca, PRODUCT p, PROD_GROUP pg
WHERE (pg.group_name = 'farmhouse' OR pg.group_name = 'beard care')
AND c.cust_id = o.cust_id AND o.ord_id = ca.ord_id AND ca.prod_id =
p.prod_id AND p.group_id = pg.group_id
GROUP BY c.cust_id, c.first_name, c.last_name
```

Correct answer:

```
CUST_ID FIRST_NAME           LAST_NAME
------- -------------------- ---------
      3 tomas                kvist
      4 hans                 rosenboll
      6 gustav               moller
```

Task 4

Show **cust_id**, **first_name**, **last_name** and the **total order value** that customers have shopped for.

```
-- Task 4

SELECT c.cust_id, c.first_name, c.last_name, SUM(ca.quantity*p.price)
TOTAL FROM CUSTOMER c, CUST_ORDER o, CART ca, PRODUCT p
WHERE c.cust_id = o.cust_id AND o.ord_id = ca.ord_id AND ca.prod_id =
p.prod_id
GROUP BY c.cust_id, c.first_name, c.last_name
ORDER BY c.cust_id;
```

Correct answer:

```
CUST_ID FIRST_NAME        LAST_NAME        TOTAL
------- ----------------- ---------------- ------
      1 olof              andersson        2566,5
      2 maria             andersson           231
      3 tomas             kvist              1472
      4 hans              rosenboll        2544,5
      5 yvette            porpoix            1590
      6 gustav            moller           1453,5
      9 ollas             bullas           1270,5
     10 roger             nyberg             4222
```

Task 5

Show **cust_id**, **first_name**, **last_name** and the **total order value** that customers have shopped for. Sort the result, so the customer with the highest total order value comes first. Show the total order value without any decimals. **Hint!** The `ROUND()` Function.

```
-- TASK 5

SELECT c.cust_id, c.first_name, c.last_name,
round(sum(ca.quantity*p.PRICE)) TOTAL
FROM CUSTOMER c, CUST_ORDER o, CART ca, PRODUCT p WHERE c.cust_id =
o.cust_id and o.ord_id = ca.ord_id AND ca.prod_id = p.prod_id
GROUP BY c.cust_id, c.first_name, c.last_name ORDER BY TOTAL DESC;
```

Correct Answer:

```
CUST_ID FIRST_NAME          LAST_NAME      TOTAL
------- ------------------- -------------- ------
     10 roger               nyberg           4222
      1 olof                andersson        2567
      4 hans                rosenboll        2545
      5 yvette              porpoix          1590
      3 tomas               kvist            1472
      6 gustav              möller           1454
```

```
      9 ollas                bullas           1271
      2 maria                andersson         231
```

Task 6
Same as in task 5, but show only customers who have a total over 1500.

```
-- TASK6


SELECT c.cust_id, c.first_name, c.last_name,
ROUND(SUM(ca.quantity*p.price)) TOTAL
FROM CUSTOMER c, CUST_ORDER o, CART ca, PRODUCT p
WHERE c.cust_id = o.cust_id AND o.ord_id = ca.ord_id AND ca.prod_id =
p.prod_id
GROUP BY c.cust_id, c.first_name, c.last_name
HAVING ROUND(sum(ca.quantity*p.price)) > 1500
ORDER BY TOTAL DESC;
```

Correct answer:

```
CUST_ID FIRST_NAME           LAST_NAME      TOTAL
------- -------------------- -------------- ------
     10 roger                nyberg           4222
      1 olof                 andersson        2567
      4 hans                 rosenboll        2545
      5 yvette               porpoix          1590
```

Task 7
Show **first_name** and **last_name capitalized**, for those customers who **have no** orders.

```
-- TASK 7

SELECT INITCAP(c.first_name) as first_name, INITCAP(c.last_name) as
last_name
FROM customer c
WHERE c.CUST_ID NOT IN (SELECT CUST_ID FROM CUST_ORDER);
```

Correct answer:

```
FIRST_NAME           LAST_NAME
-------------------- ---------
Zoltan               Habbervic
Lena                 Larsson
```

Task 8

Show **group_name** and the **price** for the most expensive product in that product group

```
-- TASK 8

select * from (select group_name, most_expensive from prod_group p ,
(select group_id,max(price) as most_expensive from product group by
group_id) g
where p.group_id = g.group_id) order by rownum desc;
```

Correct answer:

```
GROUP_NAME                     MOST_EXPENSIVE
------------------------------ --------------
farmhouse                                 240
leisure                                 788,5
hunting                                   795
beard care                              198,5
```

Task 9

Show **prod_id**, and the **full path** to the image of the products that have an image. You get the full path by **concatenate** *path*, *pict_id* and *file_type*.

```
-- TASK 9

SELECT PROD_ID, path||pict_id||'.'||file_type AS FULL_PATH
FROM PROD_PICT;
```

Correct answer:

```
PROD_ID FULL_PATH
------- ----------------
 1434   /images/1/1.jpg
  113   /images/2/2.jpg
 5896   /images/3/3.jpg
 1888   /images/4/4.gif
```

Task 10

Show **first name** and **last name** for those customers who owns a customer order that was created during 2004.

```
-- Task 10
SELECT c.FIRST_NAME, c.LAST_NAME
FROM CUSTOMER c, CUST_ORDER o
WHERE EXTRACT (YEAR FROM TO_DATE(o.ORDER_DATE, 'DD-MON-RR')) = 2004
AND c.CUST_ID = o.CUST_ID
GROUP BY c.FIRST_NAME, c.LAST_NAME
order by c.LAST_NAME asc;
```

Correct answer:

```
FIRST_NAME           LAST_NAME
-------------------- ---------
olof                 andersson
gustav               moller
```

Optional task (not necessary for the lab)
Show ord_id and total order value for the most expensive customer order.

Correct answer:

```
ORD_ID      TOTAL
------ ----------
   324       4222
```

Put the lab report in Learn (Blackboard). Click on the link Assignments.