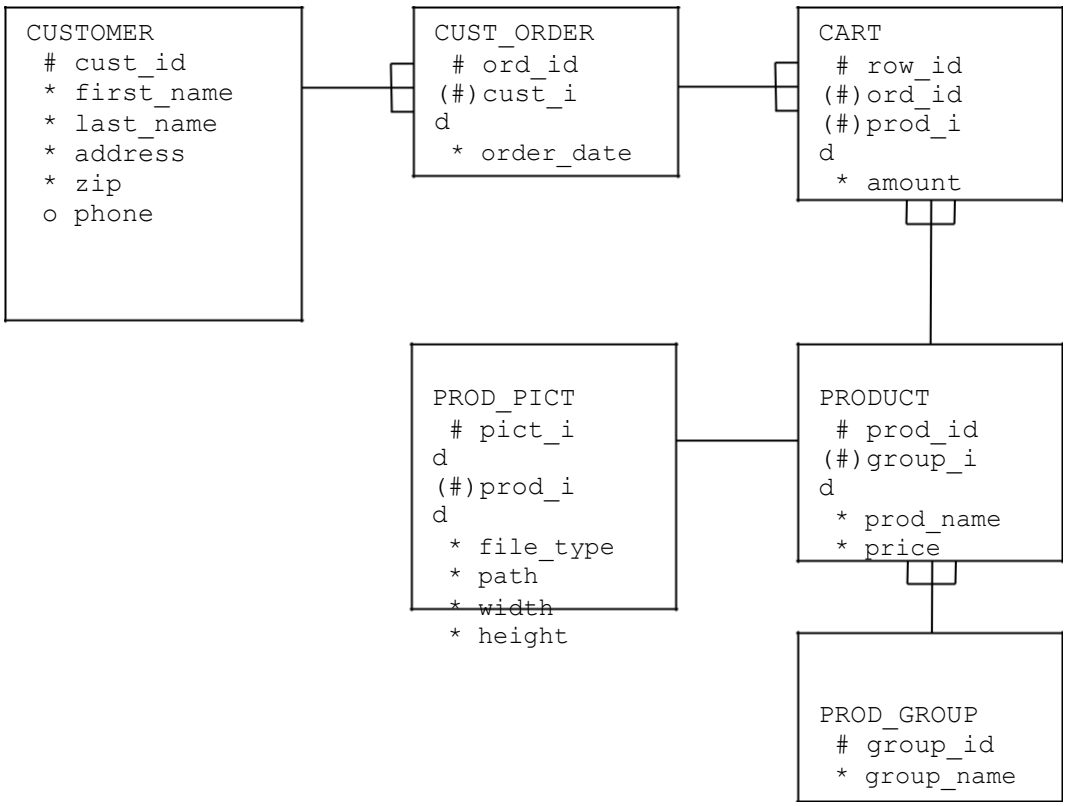
SQL Queries:

```
-----------------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),
amount 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)
```

```
------------------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.

```
SELECT * FROM
(select customer.cust_id, customer.first_name, customer.last_name,
  COUNT(cust_order.cust_id) AS "number_of _order"
FROM customer INNER JOIN cust_order ON customer.cust_id =
cust_order.cust_id GROUP BY customer.cust_id, customer.first_name,
customer.last_name order by customer.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)

```
select customer.cust_id, customer.first_name, customer.last_name
from customer
where customer.cust_id in(
select cust_id from cust_order
where ord_id in(
select cart.ord_id from cart
where prod_id in(
select prod_id from product
where group_id in ( select group_id
from prod_group
where prod_group.group_name in ('farmhouse','beard care'))))) group
by customer.cust_id, customer.first_name, customer.last_name order
by customer.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)

```
select customer.cust_id, customer.first_name, customer.last_name
from customer, cust_order, cart, prod_group, product, prod_pict
where group_name in ('farmhouse','beard care') and
customer.cust_id = cust_order.cust_id
and cust_order.ord_id = cart.ord_id
and product.prod_id = cart.prod_id
and prod_group.group_id = product.group_id
and product.prod_id = prod_pict.prod_id
group by customer.cust_id, customer.first_name, customer.last_name
order by customer.cust_id;
```

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 amount** that customers have shopped for.

```
select * from (select customer.cust_id, customer.first_name, customer.last_name,
sum(product.price * cart.amount) as "total_amounts"
from customer inner join cust_order on customer.cust_id =
cust_order.cust_id inner join cart on cust_order.ord_id = cart.ord_id inner
join product on product.prod_id = cart.prod_id
group by customer.cust_id, customer.first_name, customer.last_name
order by customer.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 amount** that customers have shopped for. Sort the result, so the customer with the highest total amount comes first. Show the total amount without any decimals. **Hint!** The

```
select customer.cust_id, customer.first_name, customer.last_name,
round(sum(product.price * cart.amount)) as "total_amounts"
from customer inner join cust_order on customer.cust_id =
cust_order.cust_id inner join cart on cust_order.ord_id
= cart.ord_id inner join product on product.prod_id =
cart.prod_id
group by customer.cust_id, customer.first_name, customer.last_name
order by "total_amounts" desc;
```

`ROUND()` Function.

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.

```
select customer.cust_id, customer.first_name, customer.last_name,
round(sum(product.price * cart.amount)) as "total_amounts"
from customer inner join cust_order on customer.cust_id =
cust_order.cust_id inner join cart on cust_order.ord_id = cart.ord_id inner
join product on product.prod_id = cart.prod_id
group by customer.cust_id, customer.first_name, customer.last_name
having round(sum(product.price * cart.amount)) > 1500 order by
"total_amounts" 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.

```
update customer set(first_name) = initcap(first_name);
update customer set (last_name) = initcap(last_name);
select customer.first_name, customer.last_name from customer where customer.cust_id
not in (select cust_order.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

```
select * from (select prod_group.group_name, max(product.price) as
"most_expensive" from prod_group inner join product on prod_group.group_id =
product.group_id group by prod_group.group_name);
```

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*.

```
SELECT prod_pict.prod_id, CONCAT(concat(prod_pict.path,
concat(prod_pict.pict_id, '.')), prod_pict.file_type) as full_path from prod_pict
group by prod_pict.prod_id, prod_pict.path, prod_pict.pict_id, prod_pict.file_type
order by prod_pict.pict_id;
```

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.

```
select customer.first_name, customer.last_name from customer inner join cust_order on (customer.cust_id = cust_order.cust_id)
where cust_order.order_date >= to_date('10-jan-2004') and cust_order.order_date <= to_date('10-dec-2004')
group by customer.first_name, customer.last_name;
```

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
```