**1)** For each customer, compute the minimum and maximum sales quantities along with the corresponding products (purchased), dates (i.e., dates of those minimum and maximum sales quantities) and the states in which the sale transactions took place. If there are >1 occurrences of the min or max, display all. For the same customer, compute the average sales quantity.

**Solution:**

WITH q1 as

(select CUST,min(QUANT) as MIN\_Q from sales group by CUST),

q2 as

(select q1.CUST,s.PROD,q1.MIN\_Q,s.date,s.state from q1 left outer join sales as s on q1.CUST=s.CUST and q1.MIN\_Q=s.QUANT),

q3 as

(select CUST,max(QUANT) as MAX\_Q from sales group by CUST),

q4 as

(select q3.CUST,s.PROD,q3.MAX\_Q,s.date,s.state from q3,sales as s where q3.CUST=s.CUST and q3.MAX\_Q=s.QUANT),

q5 as

(select CUST,avg(QUANT) as AVG\_Q from sales group by CUST)

select q2.CUST as CUSTOMER,q2.MIN\_Q,q2.PROD as MIN\_PROD,q2.date as MIN\_DATE,q2.state as ST,q4.MAX\_Q,q4.PROD as MAX\_PROD,q4.DATE as MAX\_DATE,q4.STATE as ST,q5.AVG\_Q from q2,q4,q5 where q2.CUST=q5.CUST and q4.CUST=q5.CUST

**2)** For each of the 12 months (regardless of the year), find the most “productive” and least “productive” days (those days with most and least total sales quantities) and the corresponding total sales quantities (i.e., SUMs).

**Solution:**

WITH q1 as

(select MONTH,DAY,sum(QUANT) as DAY\_SUM from sales group by MONTH,DAY order by MONTH,DAY),

q2 as

(select MONTH,max(DAY\_SUM) as MONTH\_MAX from q1 group by MONTH order by MONTH),

q3 as

(select MONTH,min(DAY\_SUM) as MONTH\_MIN from q1 group by MONTH order by MONTH),

q4 as

(select q1.MONTH,q1.DAY as MOST\_PROFIT\_DAY,q1.DAY\_SUM as MOST\_PROFIT\_TOTAL\_Q from q1,q2 where q2.MONTH=q1.MONTH and q1.DAY\_SUM=q2.MONTH\_MAX),

q5 as

(select q1.MONTH,q1.DAY as LEAST\_PROFIT\_DAY,q1.DAY\_SUM as LEAST\_PROFIT\_TOTAL\_Q from q1,q3 where q3.MONTH=q1.MONTH and q1.DAY\_SUM=q3.MONTH\_MIN)

select q4.MONTH,q4.MOST\_PROFIT\_DAY,q4.MOST\_PROFIT\_TOTAL\_Q,q5.LEAST\_PROFIT\_DAY,q5.LEAST\_PROFIT\_TOTAL\_Q from q4,q5 where q4.MONTH=q5.MONTH

**3)** For each product, find the “most favorable” month (when most amount of the product was sold) and the “least favorable” month (when the least amount of the product was sold).

**Solution:**

WITH q1 as

(select PROD,MONTH,DAY,sum(QUANT) as QUANT\_SUM from sales group by PROD,MONTH,DAY order by PROD,MONTH,DAY),

q2 as

(select PROD,MONTH,sum(QUANT\_SUM) as MONTH\_SUM from q1 group by PROD,MONTH order by PROD,MONTH),

q3 as

(select PROD,max(MONTH\_SUM) as QUANT\_MAX from q2 group by PROD order by PROD),

q4 as

(select q2.PROD,q2.MONTH as MOST\_FAV\_MO from q2,q3 where q2.PROD=q3.PROD and q3.QUANT\_MAX=q2.MONTH\_SUM),

q5 as

(select PROD,min(MONTH\_SUM) as QUANT\_MIN from q2 group by PROD order by PROD),

q6 as

(select q2.PROD,q2.MONTH as LEAST\_FAV\_MO from q2,q5 where q2.PROD=q5.PROD and q5.QUANT\_MIN=q2.MONTH\_SUM)

select q4.PROD,q4.MOST\_FAV\_MO,q6.LEAST\_FAV\_MO from q4,q6 where q4.PROD=q6.PROD

**4)** Show for each customer and product combination, the average sales quantities for 4 quarters, Q1, Q2, Q3 and Q4 (in four separate columns) – Q1 being the first 3 months of the year (Jan, Feb & Mar), Q2 the next 3 months (Apr, May & Jun), and so on – ignore the YEAR component of the dates (i.e., 3/11/2016 is considered the same date as 3/11/2020, etc.). Also compute the average for the “whole” year (again ignoring the YEAR component, meaning simply compute AVG) along with the total quantities (SUM) and the counts (COUNT).

**Solution:**

WITH q1 as

(select CUST,PROD,avg(QUANT) as Q1\_AVG from sales where month in (1,2,3) group by CUST,PROD),

q2 as

(select CUST,PROD,avg(QUANT) as Q2\_AVG from sales where month in (4,5,6) group by CUST,PROD),

q3 as

(select CUST,PROD,avg(QUANT) as Q3\_AVG from sales where month in (7,8,9) group by CUST,PROD),

q4 as

(select CUST,PROD,avg(QUANT) as Q4\_AVG from sales where month in (10,11,12) group by CUST,PROD),

q5 as

(select CUST,PROD,avg(QUANT) as AVERAGE,sum(QUANT) as TOTAL,count(QUANT) as COUNT from sales group by CUST,PROD)

select q5.CUST as CUSTOMER,q5.PROD as PRODUCT,q1.Q1\_AVG,q2.Q2\_AVG,q3.Q3\_AVG,q4.Q4\_AVG,q5.AVERAGE,q5.TOTAL,q5.COUNT from q5,q4,q3,q2,q1 where q4.CUST=q5.CUST and q4.PROD=q5.PROD and q3.CUST=q5.CUST and q3.PROD=q5.PROD and q2.CUST=q5.CUST and q2.PROD=q5.PROD and q1.CUST=q5.CUST and q1.PROD=q5.PROD

WITH q1 as

(select CUST,PROD,avg(QUANT) as Q1\_AVG from sales where month in (1,2,3) group by CUST,PROD),

q2 as

(select CUST,PROD,avg(QUANT) as Q2\_AVG from sales where month in (4,5,6) group by CUST,PROD),

q3 as

(select CUST,PROD,avg(QUANT) as Q3\_AVG from sales where month in (7,8,9) group by CUST,PROD),

q4 as

(select CUST,PROD,avg(QUANT) as Q4\_AVG from sales where month in (10,11,12) group by CUST,PROD),

q5 as

(select CUST,PROD,avg(QUANT) as AVERAGE,sum(QUANT) as TOTAL,count(QUANT) as COUNT from sales group by CUST,PROD)

select q5.CUST as CUSTOMER,q5.PROD as PRODUCT,q1.Q1\_AVG,q2.Q2\_AVG,q3.Q3\_AVG,q4.Q4\_AVG,q5.AVERAGE,q5.TOTAL,q5.COUNT from q5 left join q4 on q4.CUST=q5.CUST and q4.PROD=q5.PROD left join q3 on q3.CUST=q5.CUST and q3.PROD=q5.PROD left join q2 on q2.CUST=q5.CUST and q2.PROD=q5.PROD left join q1 on q1.CUST=q5.CUST and q1.PROD=q5.PROD

**5)** For each combination of customer and product, output the maximum sales quantities for NJ, NY and CT in 3 separate columns. Like the first report, display the corresponding dates (i.e., dates of those corresponding maximum sales quantities). Furthermore, show the output only if maximum for NY is greater than NJ or CT.

**Solution:**

WITH q1 as

(select CUST,PROD,max(QUANT) as NJ\_MAX from sales where STATE='NJ' group by CUST,PROD),

q2 as

(select q1.CUST,q1.PROD,q1.NJ\_MAX,s.DATE from q1 left join sales as s on q1.CUST=s.CUST and q1.PROD=s.PROD and s.QUANT=q1.NJ\_MAX),

q3 as

(select CUST,PROD,max(QUANT) as NY\_MAX from sales where STATE='NY' group by CUST,PROD),

q4 as

(select q3.CUST,q3.PROD,q3.NY\_MAX,s.DATE from q3 left join sales as s on q3.CUST=s.CUST and q3.PROD=s.PROD and s.QUANT=q3.NY\_MAX),

q5 as

(select CUST,PROD,max(QUANT) as CT\_MAX from sales where STATE='CT' group by CUST,PROD),

q6 as

(select q5.CUST,q5.PROD,q5.CT\_MAX,s.DATE from q5 left join sales as s on q5.CUST=s.CUST and q5.PROD=s.PROD and s.QUANT=q5.CT\_MAX),

q7 as

(select q2.CUST as CUSTOMER,q2.PROD as PRODUCT,q2.NJ\_MAX,q2.DATE,q4.NY\_MAX,q4.DATE,q6.CT\_MAX,q6.DATE from q2,q4,q6 where q2.CUST=q4.CUST and q2.PROD=q4.PROD and q4.CUST=q6.CUST and q4.PROD=q6.PROD)

select \* from q7 where NY\_MAX>NJ\_MAX or NY\_MAX>CT\_MAX

WITH q1 as

(select CUST,PROD,max(QUANT) as NJ\_MAX from sales where STATE='NJ' group by CUST,PROD),

q2 as

(select q1.CUST,q1.PROD,q1.NJ\_MAX,s.DATE from q1 left join sales as s on q1.CUST=s.CUST and q1.PROD=s.PROD and s.QUANT=q1.NJ\_MAX),

q3 as

(select CUST,PROD,max(QUANT) as NY\_MAX from sales where STATE='NY' group by CUST,PROD),

q4 as

(select q3.CUST,q3.PROD,q3.NY\_MAX,s.DATE from q3 left join sales as s on q3.CUST=s.CUST and q3.PROD=s.PROD and s.QUANT=q3.NY\_MAX),

q5 as

(select CUST,PROD,max(QUANT) as CT\_MAX from sales where STATE='CT' group by CUST,PROD),

q6 as

(select q5.CUST,q5.PROD,q5.CT\_MAX,s.DATE from q5 left join sales as s on q5.CUST=s.CUST and q5.PROD=s.PROD and s.QUANT=q5.CT\_MAX),

q7 as

(select q2.CUST as CUSTOMER,q2.PROD as PRODUCT,q2.NJ\_MAX,q2.DATE,q4.NY\_MAX,q4.DATE,q6.CT\_MAX,q6.DATE from q2 left join q4 on q2.CUST=q4.CUST and q2.PROD=q4.PROD left join q6 on q4.CUST=q6.CUST and q4.PROD=q6.PROD)

select \* from q7 where NY\_MAX>NJ\_MAX or NY\_MAX>CT\_MAX