**1)** For each product and month, count the number of sales transactions that were between the previous and the following month's average sales quantities. For January and December, display or 0

**Solution:**

WITH q1 as

(select PROD,MONTH,avg(QUANT) as MONTH\_AVG from sales group by PROD,MONTH order by PROD,MONTH),

q2 as

(select t1.PROD,t1.MONTH,t2.MONTH\_AVG as MONTH\_BEFORE\_AVG from q1 as t1,q1 as t2 where t1.PROD=t2.PROD and t1.MONTH=t2.MONTH+1),

q3 as

(select t1.PROD,t1.MONTH,t2.MONTH\_AVG as MONTH\_AFTER\_AVG from q1 as t1,q1 as t2 where t1.PROD=t2.PROD and t1.MONTH=t2.MONTH-1),

q4 as

(select q1.PROD,q1.MONTH,q1.MONTH\_AVG,q2.MONTH\_BEFORE\_AVG,q3.MONTH\_AFTER\_AVG from q1 natural full join q2 natural full join q3),

q5 as

(select s.PROD as PRODUCT,s.MONTH as MONTH,count(QUANT) as SALES\_COUNT\_BETWEEN\_AVGS from sales as s,q4 where QUANT between q4.MONTH\_BEFORE\_AVG and q4.MONTH\_AFTER\_AVG group by s.PROD,s.MONTH order by s.PROD,s.MONTH)

select \* from q5

**3)** For each customer, product and state combination, compute (1) the product’s average sale of this customer for the state (i.e., the simple AVG for the group-by attributes – this is the easy part), (2) the average sale of the product and the state but for all of the other customers and (3) the customer’s average sale for the given state, but for all of the other products.

**Solution:**

WITH q1 as

(select CUST,PROD,STATE,avg(QUANT) as PROD\_AVG from sales group by CUST,PROD,STATE order by CUST,PROD,STATE),

q2 as

(select q1.CUST,q1.PROD,q1.STATE,avg(QUANT) as OTHER\_CUST\_AVG from q1,sales as s where q1.CUST!=s.CUST and q1.STATE=s.STATE and q1.PROD=s.PROD group by q1.CUST,q1.PROD,q1.STATE order by q1.CUST,q1.PROD,q1.STATE),

q3 as

(select q1.CUST,q1.PROD,q1.STATE,avg(QUANT) as OTHER\_PROD\_AVG from q1,sales as s where q1.CUST=s.CUST and q1.STATE=s.STATE and q1.PROD!=s.PROD group by q1.CUST,q1.PROD,q1.STATE order by q1.CUST,q1.PROD,q1.STATE)

select q1.CUST as CUSTOMER,q1.PROD as PRODUCT,q1.STATE as STATE,q1.PROD\_AVG,q2.OTHER\_CUST\_AVG,q3.OTHER\_PROD\_AVG from q1 full join q2 on q1.CUST=q2.CUST and q1.PROD=q2.PROD and q1.STATE=q2.STATE full join q3 on q1.CUST=q3.CUST and q1.PROD=q3.PROD and q1.STATE=q3.STATE