1. List the total sales by region and customer. Your output should be sorted by region name and customer code. (**6 pts**)

```
saleco_dw=> SELECT C.REG_ID, S.CUS_CODE, SUM(S.SALE_UNITS*S.SALE_PRICE) AS
TOTAL_SALES
FROM DWDAYSALESFACT S JOIN DWCUSTOMER C ON S.CUS_CODE = C.CUS_CODE
GROUP BY C.REG_ID, S.CUS_CODE
ORDER BY C.REG_ID, S.CUS_CODE;
 reg_id | cus_code | total_sales
--------+----------+-------------
      1 |    10012 |      287.91
      1 |    10013 |       64.32
      2 |    10014 |      494.71
      2 |    10019 |       39.95
      3 |    10010 |      180.26
      3 |    10011 |      130.89
      3 |    10015 |      325.82
      3 |    10016 |      179.22
      4 |    10017 |      419.66
      4 |    10018 |      129.32
(10 rows)
```

2. Repeat #1 but produce the output using ROLLUP with region name and customer code. (**2 pts**)

```
saleco_dw=> SELECT C.REG_ID, S.CUS_CODE, SUM(S.SALE_UNITS*S.SALE_PRICE) AS TOTAL_SALES FROM DWDAYSALESFACT S JOIN DWCUSTOMER C ON S.CUS_CODE = C.CUS_CODE GROUP BY
ROLLUP (C.REG_ID,S.CUS_CODE);
 reg_id | cus_code | total_sales
--------+----------+-------------
        |          |     2252.06
      4 |    10017 |      419.66
      3 |    10010 |      180.26
      2 |    10014 |      494.71
      1 |    10012 |      287.91
      3 |    10011 |      130.89
      3 |    10016 |      179.22
      1 |    10013 |       64.32
      4 |    10018 |      129.32
      2 |    10019 |       39.95
      3 |    10015 |      325.82
      1 |          |      352.23
      4 |          |      548.98
      2 |          |      534.66
      3 |          |      816.19
(15 rows)
```

3. Repeat #1 but product the output using CUBE with region name and customer code. (2 pts)

```
saleco_dw=> SELECT C.REG_ID, S.CUS_CODE, SUM(S.SALE_UNITS*S.SALE_PRICE) AS TOTAL_SALES FROM DWDAYSALESFACT S JOIN DWCUSTOMER C ON S.CUS_CODE = C.CUS_CODE GROUP BY
CUBE (C.REG_ID,S.CUS_CODE);
 reg_id | cus_code | total_sales
--------+----------+-------------
        |          |     2252.06
      4 |    10017 |      419.66
      3 |    10010 |      180.26
      2 |    10014 |      494.71
      1 |    10012 |      287.91
      3 |    10011 |      130.89
      3 |    10016 |      179.22
      1 |    10013 |       64.32
      4 |    10018 |      129.32
      2 |    10019 |       39.95
      3 |    10015 |      325.82
      1 |          |      352.23
      4 |          |      548.98
      2 |          |      534.66
      3 |          |      816.19
        |    10019 |       39.95
        |    10013 |       64.32
        |    10012 |      287.91
        |    10014 |      494.71
        |    10011 |      130.89
        |    10015 |      325.82
        |    10010 |      180.26
        |    10016 |      179.22
        |    10017 |      419.66
        |    10018 |      129.32
(25 rows)
```

4. a) Explain the additional information/intelligence gained when using ROLLUP or CUBE (5 pts) b) Use the output from questions 1, 2 and 3 to explain what the data reveals. (5 pts)

The additional information gained when using ROLLUP are sub-totals and grand totals for columns passed to the GROUP BY ROLLUP statement. The GROUP BY CUBE provides all combinations for the selected columns.

5. List the total sales by customer code, month, and product code; sort by customer code and month. (5 pts)

```
saleco_dw=>  SELECT dwdaysalesfact.cus_code,dwdaysalesfact.p_code,dwdaysalesfact.sale_price,dwtime.tm_month FROM dwdaysalesfact LEFT JOIN dwtime ON dwdaysalesfact.tm_id = dwtime.tm_id ORDER BY cus_code,tm
_month;
 cus_code |  p_code  | sale_price | tm_month
----------+----------+------------+----------
    10010 | 13-Q2/P2 |      14.99 |       10
    10010 | PVC23DRT |       5.87 |       10
    10010 | 23109-HB |       9.95 |       10
    10010 | 54778-2T |       4.99 |       10
    10011 | SM-18277 |       6.99 |       10
    10011 | 2232/QTY |     109.92 |       10
    10012 | SM-18277 |       6.99 |        9
    10012 | 89-WRE-Q |     256.99 |       10
    10012 | 23109-HB |       9.95 |       10
    10013 | PVC23DRT |       5.87 |       10
    10013 | 13-Q2/P2 |      14.99 |       10
    10013 | 54778-2T |       4.99 |       10
    10014 | 23109-HB |       9.95 |        9
    10014 | 13-Q2/P2 |      14.99 |        9
    10014 | 2232/QTY |     109.92 |        9
    10014 | WR3/TT3  |     119.95 |       10
    10015 | 2238/QPD |      38.95 |        9
    10015 | 23109-HB |       9.95 |        9
    10015 | 89-WRE-Q |     256.99 |        9
    10015 | 54778-2T |       4.99 |        9
    10015 | 23109-HB |       9.95 |       10
    10016 | 1546-QQ2 |      39.95 |        9
    10016 | PVC23DRT |       5.87 |        9
    10016 | 54778-2T |       4.99 |        9
    10016 | 13-Q2/P2 |      14.99 |        9
    10016 | 13-Q2/P2 |      14.99 |        9
    10017 | 23109-HB |       9.95 |        9
    10017 | WR3/TT3  |     119.95 |        9
    10017 | 23109-HB |       9.95 |        9
    10017 | 54778-2T |       4.99 |        9
    10017 | 13-Q2/P2 |      14.99 |        9
    10018 | PVC23DRT |       5.87 |        9
    10018 | 54778-2T |       4.99 |        9
    10018 | 23109-HB |       9.95 |        9
    10018 | 2238/QPD |      38.95 |        9
    10019 | 1546-QQ2 |      39.95 |        9
(36 rows)
```

6. Show all purchases (total sales) in September to show which customer bought the most product in September. Show customer code, customer name and total sales; sort all output by total sales with the highest sales on top. (5 pts).

```
saleco_dw=>  SELECT dwdaysalesfact.cus_code, dwcustomer.cus_lname,dwdaysalesfact.sale_price FROM dwdaysalesfact JOIN dwtime ON dwdaysalesfact.tm_id = dwtime.tm_id JOIN dwcustomer ON dwdaysalesfact.cus_cod
e = dwcustomer.cus_code WHERE dwtime.tm_month = 9 ORDER BY dwdaysalesfact.cus_code DESC;
 cus_code | cus_lname | sale_price
----------+-----------+------------
    10019 | Smith     |      39.95
    10018 | Farriss   |       9.95
    10018 | Farriss   |       4.99
    10018 | Farriss   |       5.87
    10018 | Farriss   |      38.95
    10017 | Williams  |       9.95
    10017 | Williams  |       4.99
    10017 | Williams  |       9.95
    10017 | Williams  |      14.99
    10017 | Williams  |     119.95
    10016 | Brown     |       4.99
    10016 | Brown     |      39.95
    10016 | Brown     |      14.99
    10016 | Brown     |      14.99
    10016 | Brown     |       5.87
    10015 | O'Brian   |       9.95
    10015 | O'Brian   |       4.99
    10015 | O'Brian   |      38.95
    10015 | O'Brian   |     256.99
    10014 | Orlando   |      14.99
    10014 | Orlando   |     109.92
    10014 | Orlando   |       9.95
    10012 | Smith     |       6.99
(23 rows)
```

```
saleco_dw=> SELECT dwdaysalesfact.cus_code, dwcustomer.cus_lname, SUM(dwdaysalesfact.sale_price) AS total_sales FROM dwdaysalesfact JOIN dwtime ON dwdaysalesfact.tm_id = dwtime.tm_id JOIN dwcustomer ON dw
daysalesfact.cus_code = dwcustomer.cus_code WHERE dwtime.tm_month = 9 GROUP BY dwdaysalesfact.cus_code, dwcustomer.cus_lname ORDER BY SUM(dwdaysalesfact.sale_price);
 cus_code | cus_lname | total_sales
----------+-----------+-------------
    10012 | Smith     |        6.99
    10019 | Smith     |       39.95
    10018 | Farriss   |       59.76
    10016 | Brown     |       80.79
    10014 | Orlando   |      134.86
    10017 | Williams  |      159.83
    10015 | O'Brian   |      310.88
(7 rows)
```

7. List the total sales by month and product category. Your output should be sorted by month and product category. (8 pts)

```
saleco_dw=> SELECT T.TM_MONTH, P.P_CATEGORY, SUM(S.SALE_UNITS*S.SALE_PRICE) AS
saleco_dw-> TOTAL_SALES
saleco_dw-> FROM DWTIME T JOIN DWDAYSALESFACT S ON T.TM_ID = S.TM_ID
saleco_dw-> JOIN DWPRODUCT P ON P.P_CODE = S.P_CODE
saleco_dw-> GROUP BY T.TM_MONTH, P.P_CATEGORY
saleco_dw-> ORDER BY T.TM_MONTH, P.P_CATEGORY;
 tm_month | p_category | total_sales
----------+------------+-------------
        9 | CAT1       |      174.83
        9 | CAT2       |      446.81
        9 | CAT3       |      537.54
        9 | CAT4       |       80.67
       10 | CAT1       |      124.89
       10 | CAT2       |      366.91
       10 | CAT3       |      459.64
       10 | CAT4       |       60.77
(8 rows)
```

8. List the number of product sales (number of rows) and total sales by month. Your output should be sorted by month and should show one row per month. (8 pts)

```
saleco_dw=> SELECT T.TM_MONTH, COUNT(S.TM_ID) AS PRODUCT_SALES,
SUM(S.SALE_UNITS*S.SALE_PRICE) AS TOTAL_SALES
FROM DWDAYSALESFACT S JOIN DWTIME T ON S.TM_ID = T.TM_ID
GROUP BY TM_MONTH
ORDER BY TM_MONTH DESC;
 tm_month | product_sales | total_sales
----------+---------------+-------------
       10 |            13 |     1012.21
        9 |            23 |     1239.85
(2 rows)
```

9. Show product category, product code, product description and units sold (sum). Which product is the best seller based on units sold? a) Show units sold for September (3 pts), b) Show units sold for October (3 pts)

```
saleco_dw=> SELECT dwproduct.p_code, dwproduct.p_category, dwtime.tm_month, COUNT(dwdaysalesfact.cus_code) AS row , SUM(dwdaysalesfact.sale_price) AS sales FROM dwdaysalesfact, dwtime, dwproduct GROUP BY
dwproduct.p_code , dwproduct.p_category, dwtime.tm_month ORDER BY dwproduct.p_code DESC;
  p_code  | p_category | tm_month | row |  sales
----------+------------+----------+-----+---------
 WR3/TT3  | CAT3       |        9 | 108 | 4105.38
 WR3/TT3  | CAT3       |       10 |  72 | 2736.92
 SW-23116 | CAT2       |       10 |  72 | 2736.92
 SW-23116 | CAT2       |        9 | 108 | 4105.38
 SM-18277 | CAT4       |       10 |  72 | 2736.92
 SM-18277 | CAT4       |        9 | 108 | 4105.38
 PVC23DRT | CAT3       |        9 | 108 | 4105.38
 PVC23DRT | CAT3       |       10 |  72 | 2736.92
 89-WRE-Q | CAT2       |       10 |  72 | 2736.92
 89-WRE-Q | CAT2       |        9 | 108 | 4105.38
 54778-2T | CAT1       |        9 | 108 | 4105.38
 54778-2T | CAT1       |       10 |  72 | 2736.92
 23114-AA | CAT4       |        9 | 108 | 4105.38
 23114-AA | CAT4       |       10 |  72 | 2736.92
 23109-HB | CAT4       |       10 |  72 | 2736.92
 23109-HB | CAT4       |        9 | 108 | 4105.38
 2238/QPD | CAT3       |        9 | 108 | 4105.38
 2238/QPD | CAT3       |       10 |  72 | 2736.92
 2232/QWE | CAT3       |       10 |  72 | 2736.92
 2232/QWE | CAT3       |        9 | 108 | 4105.38
 2232/QTY | CAT2       |       10 |  72 | 2736.92
 2232/QTY | CAT2       |        9 | 108 | 4105.38
 1558-QW1 | CAT2       |       10 |  72 | 2736.92
 1558-QW1 | CAT2       |        9 | 108 | 4105.38
 1546-QQ2 | CAT2       |       10 |  72 | 2736.92
 1546-QQ2 | CAT2       |        9 | 108 | 4105.38
 14-Q1/L3 | CAT1       |       10 |  72 | 2736.92
 14-Q1/L3 | CAT1       |        9 | 108 | 4105.38
 13-Q2/P2 | CAT1       |        9 | 108 | 4105.38
 13-Q2/P2 | CAT1       |       10 |  72 | 2736.92
 11QER/31 | CAT1       |        9 | 108 | 4105.38
 11QER/31 | CAT1       |       10 |  72 | 2736.92
(32 rows)
```

```
saleco_dw=> SELECT dwdaysalesfact.cus_code,dwcustomer.cus_lname,dwdaysalesfact.sale_price FROM dwdaysalesfact JOIN dwtime ON dwdaysalesfact.tm_id = dwtime.tm_id JOIN dwcustomer ON dwdaysalesfact.cus_code
= dwcustomer.cus_code WHERE dwtime.tm_month = 9 ORDER BY dwdaysalesfact.cus_code DESC;
 cus_code | cus_lname | sale_price
----------+-----------+------------
    10019 | Smith     |      39.95
    10018 | Farriss   |       9.95
    10018 | Farriss   |       4.99
    10018 | Farriss   |       5.87
    10018 | Farriss   |      38.95
    10017 | Williams  |       9.95
    10017 | Williams  |       4.99
    10017 | Williams  |       9.95
    10017 | Williams  |      14.99
    10017 | Williams  |     119.95
    10016 | Brown     |       4.99
    10016 | Brown     |      39.95
    10016 | Brown     |      14.99
    10016 | Brown     |      14.99
    10016 | Brown     |       5.87
    10015 | O'Brian   |       9.95
    10015 | O'Brian   |       4.99
    10015 | O'Brian   |      38.95
    10015 | O'Brian   |     256.99
    10014 | Orlando   |      14.99
    10014 | Orlando   |     109.92
    10014 | Orlando   |       9.95
    10012 | Smith     |       6.99
(23 rows)
```

10. List the number of product sales (number of rows) and total sales by month, product category, and product. Your output should be sorted by month, product category and product. (**8 pts**)

```
saleco_dw=> SELECT T.TM_MONTH, P.P_CATEGORY, S.P_CODE, COUNT(S.TM_ID) AS
PRODUCT, SUM(S.SALE_UNITS*S.SALE_PRICE) AS SALES
FROM DWTIME T JOIN DWDAYSALESFACT S ON T.TM_ID=S.TM_ID
JOIN DWPRODUCT P ON P.P_CODE=S.P_CODE
GROUP BY T.TM_MONTH, P.P_CATEGORY, S.P_CODE
ORDER BY T.TM_MONTH, P.P_CATEGORY, S.P_CODE;
 tm_month | p_category |  p_code  | product | sales
----------+------------+----------+---------+--------
        9 | CAT1       | 13-Q2/P2 |       4 | 134.91
        9 | CAT1       | 54778-2T |       4 |  39.92
        9 | CAT2       | 1546-QQ2 |       2 |  79.90
        9 | CAT2       | 2232/QTY |       1 | 109.92
        9 | CAT2       | 89-WRE-Q |       1 | 256.99
        9 | CAT3       | 2238/QPD |       2 |  77.90
        9 | CAT3       | PVC23DRT |       2 |  99.79
        9 | CAT3       | WR3/TT3  |       1 | 359.85
        9 | CAT4       | 23109-HB |       5 |  59.70
        9 | CAT4       | SM-18277 |       1 |  20.97
       10 | CAT1       | 13-Q2/P2 |       2 | 104.93
       10 | CAT1       | 54778-2T |       2 |  19.96
       10 | CAT2       | 2232/QTY |       1 | 109.92
       10 | CAT2       | 89-WRE-Q |       1 | 256.99
       10 | CAT3       | PVC23DRT |       2 |  99.79
       10 | CAT3       | WR3/TT3  |       1 | 359.85
       10 | CAT4       | 23109-HB |       3 |  39.80
       10 | CAT4       | SM-18277 |       1 |  20.97
(18 rows)
```