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```
SQL> --Q1.a
SQL> CLEAR COLUMNS
columns cleared
SQL> COLUMN Manuf_Name FORMAT A10
SQL> SELECT *
  2  FROM (SELECT Manuf_Name, COUNT(DISTINCT Contract.Contract_ID) AS ContractNum,
  3               Rank() OVER (ORDER BY COUNT(DISTINCT Contract.Contract_ID) DESC) AS Rank
  4         FROM   Manufacturer JOIN Product ON Manufacturer.Manuf_ID = Product.Manuf_ID
  5                             JOIN CellPhone ON CellPhone.Phone_ID = Product.Product_ID
  6                             JOIN Contract_CellPhone cc ON cc.Phone_ID = CellPhone.Phone_ID
  7                             JOIN Contract ON Contract.Contract_ID = cc.Contract_ID
  8        WHERE  Contract.End_Date IS NULL
  9        GROUP BY Manufacturer.Manuf_ID, Manuf_Name)
 10  WHERE rank <= 5;

MANUF_NAME CONTRACTNUM       RANK
---------- ----------- ----------
Samsung              6          1
Apple                6          1
HTC                  5          3
Motorola             3          4
Nokia                2          5

SQL> --Q1.b
SQL> CLEAR COLUMNS
columns cleared
SQL> COLUMN 'Manufacturers' FORMAT A20
SQL> SELECT DECODE(Category, Null, 'Manufacturer total', Category) "Manufacturers",
  2         SUM(DECODE(LOWER(Manuf_Name),'samsung',1,0)) "Samsung",
  3         SUM(DECODE(LOWER(Manuf_Name),'apple',1,0)) "Apple",
  4         SUM(DECODE(LOWER(Manuf_Name),'htc',1,0)) "HTC",
  5         SUM(DECODE(LOWER(Manuf_Name),'motorola',1,0)) "Motorola",
  6         SUM(DECODE(LOWER(Manuf_Name),'nokia',1,0)) "Nokia",
  7         COUNT(Access_ID) AS "Category total"
  8  FROM   Accessory JOIN Product ON Access_ID = Product_ID
  9                   JOIN Manufacturer ON Product.Manuf_ID = Manufacturer.Manuf_ID
 10  GROUP BY GROUPING SETS (category, ())
 11  ORDER BY category;

Manufacturers           Samsung      Apple        HTC   Motorola      Nokia Category total
-------------------- ---------- ---------- ---------- ---------- ---------- --------------
Battery                       3          0          0          0          0              3
Car Holder                    0          0          1          0          0              1
Carryall Bag                  0          0          0          0          0              1
Case                          1          0          0          0          0              4
Charger                       0          1          0          0          0              2
Headset                       0          1          0          0          0              3
Screen Guard                  1          0          0          0          0              1
Manufacturer total            5          2          1          0          0             15

8 rows selected.
```

```
SQL> --Q2
SQL> CLEAR COLUMNS
columns cleared
SQL> COLUMN Phone FORMAT A30
SQL> SELECT Phone, Num_of_Phone, Num_of_Contract, Average_Price
  2  FROM   (SELECT Manuf_Name || ' - ' || Model AS Phone, Num_of_Phone, Num_of_Contract,
  3                 RANK() OVER (PARTITION BY Manuf_Name ORDER BY (Num_of_Contract) DESC) AS RANK, Average_Price
  4  FROM   (SELECT Manuf_Name, Model, COUNT(CellPhone.Phone_ID) AS Num_of_Phone,
  5                 COUNT(DISTINCT Contract_ID) AS Num_of_Contract, TO_CHAR(AVG(PaidPrice), '$999.99') AS Average_Price
  6          FROM   Contract_CellPhone cc JOIN CellPhone ON cc.Phone_ID = CellPhone.Phone_ID
  7                   JOIN Product ON CellPhone.Phone_ID = Product.Product_ID
  8                   JOIN Manufacturer ON Manufacturer.Manuf_ID = Product.Manuf_ID
  9   GROUP BY Manuf_Name, Model))
 10  WHERE Rank = 1
 11  ORDER BY 1;

PHONE                          NUM_OF_PHONE NUM_OF_CONTRACT AVERAGE_
------------------------------ ------------ --------------- --------
Apple - iPhone 5c                         6               5  $364.17
Blackberry - Bold 9780                    4               2   $85.00
HTC - HTC One S                           5               5  $250.00
Motorola - Droid 2                        3               3  $313.33
Nokia - Lumia 900                         2               2  $100.00
Samsung - Galaxy S4 GT-i9500              3               3  $340.00
Samsung - Galaxy S II Plus                3               3  $345.00

7 rows selected.
```

```
SQL> --Q3
SQL> CLEAR COLUMNS
columns cleared
SQL> SELECT vPlan_ID AS Plan_ID, SelectedNum, Type
  2  FROM   (SELECT *
  3          FROM (SELECT vPlan_ID, COUNT(vPlan_ID) AS SelectedNum, Plan_Type AS Type, Rank() OVER (ORDER BY COUNT(vPlan_ID) DESC) AS RANK
  4                FROM   Contract JOIN Plan ON vPlan_ID = Plan_ID
  5                GROUP BY vPlan_ID, Plan_Type)
  6  WHERE Rank = 1)
  7  UNION
  8  SELECT tPlan_ID AS Plan_ID, SelectedNum, Type
  9  FROM   (SELECT *
 10          FROM (SELECT tPlan_ID, COUNT(tPlan_ID) AS SelectedNum, Plan_Type AS Type, Rank() OVER (ORDER BY COUNT(tPlan_ID) DESC) AS RANK
 11                FROM   Contract JOIN Plan ON tPlan_ID = Plan_ID
 12                GROUP BY tPlan_ID, Plan_Type)
 13  WHERE Rank = 1)
 14  UNION
 15  SELECT dPlan_ID AS Plan_ID, SelectedNum, Type
 16  FROM   (SELECT *
 17          FROM (SELECT dPlan_ID, COUNT(dPlan_ID) AS SelectedNum, Plan_Type AS Type, Rank() OVER (ORDER BY COUNT(dPlan_ID) DESC) AS RANK
 18                FROM   Contract JOIN Plan ON dPlan_ID = Plan_ID
 19                GROUP BY dPlan_ID, Plan_Type)
 20  WHERE Rank = 1);

   PLAN_ID SELECTEDNUM TYPE
---------- ----------- -----
    109808           6 data
    109813           6 voice
    109814           8 text
```

```
SQL> --Q4
SQL> CLEAR COLUMNS
columns cleared
SQL> SELECT Category, COUNT(ID) AS CustomerNum,
  2         TO_CHAR(100 * COUNT(ID)/(SELECT COUNT(ID) FROM Customer), '990.99') || '%' AS "Percent"
  3  FROM   (SELECT (CASE
  4                  WHEN CreditScore >= 300 AND CreditScore <= 499 THEN 'Poor Credit'
  5                  WHEN CreditScore >= 500 AND CreditScore <= 699 THEN 'Acceptable Credit'
  6                  WHEN CreditScore >= 700 AND CreditScore <= 850 THEN 'Good/Excellent Credit'
  7                  ELSE NULL END) AS Category, ID
  8            FROM    Customer)
  9  RIGHT OUTER JOIN
 10  (SELECT 'Poor Credit' AS Category FROM customer
 11   UNION
 12   SELECT 'Acceptable Credit' AS Category FROM customer
 13   UNION
 14   SELECT 'Good/Excellent Credit' AS Category FROM customer) USING(Category)
 15  GROUP BY Category;

CATEGORY              CUSTOMERNUM Percent
--------------------- ----------- --------
Poor Credit                     0    0.00%
Good/Excellent Credit           7   35.00%
Acceptable Credit              13   65.00%

SQL> --Q5
SQL> CLEAR COLUMNS
columns cleared
SQL> COLUMN Customer FORMAT A30
SQL> COLUMN Period FORMAT A25
SQL> COLUMN Model FORMAT A15
SQL> SELECT ID || ' - ' || Lname || ', ' || Fname AS "Customer", start_date||' - '||end_date as Period,
  2         (CASE
  3          WHEN End_Date IS NULL THEN 'Active'
  4          ELSE 'Inactive' END) AS "Status", Model
  5  FROM   Customer JOIN Contract ON ID = Customer_ID
  6                  JOIN Contract_CellPhone cc ON cc.Contract_ID = Contract.Contract_ID
  7                  JOIN CellPhone ON CellPhone.Phone_ID = cc.Phone_ID
  8  WHERE  REGEXP_LIKE(LOWER(Model), 'iphone')
  9  ORDER BY 3,1;

Customer                       PERIOD                    Status   MODEL
------------------------------ ------------------------- -------- ---------------
1001 - Smith, Peter            15-DEC-14 -               Active   iPhone 6S Plus
1008 - Blayney, Alessandro     03-MAR-15 -               Active   iPhone 5c
1011 - Dutton, Lettie          09-JUN-14 -               Active   iPhone 5c
1011 - Dutton, Lettie          09-JUN-14 -               Active   iPhone 5c
1015 - Wolfe, Emily            02-FEB-15 -               Active   iPhone 6S Plus
1016 - Jones, Zach             01-JAN-15 -               Active   iPhone 5c
1020 - Freeman, Mary           25-DEC-15 -               Active   iPhone 5c
1005 - Drake, Lu               02-FEB-15 - 25-FEB-15     Inactive iPhone 5c

8 rows selected.
```

```
SQL> --Q6
SQL> CLEAR COLUMNS
columns cleared
SQL> COLUMN Model FORMAT A20
SQL> COLUMN Total_Profit FORMAT A15
SQL> COLUMN Average_Profit FORMAT A15
SQL> SELECT Model,
  2         TO_CHAR((CASE
  3                  WHEN COUNT(DISTINCT Contract.Contract_ID) = 0
  4                  THEN 0
  5                  ELSE SUM(PaidPrice-CostPaid) END),'$9999.99') AS Total_Profit,
  6         TO_CHAR((CASE
  7                  WHEN COUNT(DISTINCT Contract.Contract_ID) = 0
  8                  THEN 0
  9                  ELSE AVG(PaidPrice-CostPaid) END),'$9999.99') AS Average_Profit,
 10         COUNT(DISTINCT Contract.Contract_ID) AS "# of Contract"
 11  FROM   Contract JOIN Contract_CellPhone cc ON cc.Contract_ID = Contract.Contract_ID
 12                  RIGHT OUTER JOIN CellPhone ON CellPhone.Phone_ID = cc.Phone_ID
 13                  JOIN Product ON Product.Product_ID = CellPhone.Phone_ID
 14  GROUP BY Model
 15  ORDER BY Total_Profit DESC;

MODEL                TOTAL_PROFIT    AVERAGE_PROFIT  # of Contract
-------------------- --------------- --------------- -------------
iPhone 5c              $625.00         $104.17                   5
Galaxy S6              $270.00         $135.00                   2
HTC One S              $250.00          $50.00                   5
Droid Maxx             $220.00         $110.00                   2
Galaxy S II Plus       $207.00          $69.00                   3
iPhone 6S Plus         $204.00         $102.00                   2
Galaxy S4 GT-i9500     $180.00          $60.00                   3
Droid 2                $115.00          $38.33                   3
Galaxy S5              $100.00         $100.00                   1
Bold 9780               $85.00          $21.25                   2
Lumia 900               $60.00          $30.00                   2
Galaxy S6 Edge            $.00            $.00                   0
HTC Desire Eye            $.00            $.00                   0
iPhone 6S                 $.00            $.00                   0
iPhone 7                  $.00            $.00                   0
Nokia 100                 $.00            $.00                   0
iPhone 6                  $.00            $.00                   0
Lumia 950                 $.00            $.00                   0

18 rows selected.
```

```
SQL> --Q7
SQL> CLEAR COLUMNS
columns cleared
SQL> COLUMN State FORMAT A5
SQL> COLUMN Percent_Points FORMAT A15
SQL> SELECT State AS "State",
  2         COUNT(DISTINCT CASE
  3                        WHEN Plan.end_date IS NULL
  4                        AND Data.dPlan_ID IS NOT NULL
  5                        THEN ID
  6                        ELSE NULL END) AS "Customers with data",
  7         COUNT(DISTINCT ID) AS "Total # of customers",
  8         TO_CHAR(100 * COUNT(DISTINCT CASE
  9                                    WHEN Plan.end_date IS NULL
 10                                    AND Data.dPlan_ID IS NOT NULL
 11                                    THEN ID ELSE NULL END)/COUNT(DISTINCT ID), '9990.99') || '%' AS Percent_Points
 12  FROM   Customer JOIN Contract ON ID = Customer_ID
 13                  LEFT OUTER JOIN Data ON Contract.dPlan_ID = Data.dPlan_ID
 14                  JOIN Plan ON Plan.Plan_ID = Data.dPlan_ID
 15  WHERE  Contract.End_date IS NULL
 16  GROUP BY State
 17  ORDER BY 4 DESC;

State Customers with data Total # of customers PERCENT_POINTS
----- ------------------- -------------------- ---------------
MD                      2                    2   100.00%
CA                      2                    3    66.67%
PA                      2                    7    28.57%
NY                      0                    1     0.00%

SQL> --Q8
SQL> CLEAR COLUMNS
columns cleared
SQL> COLUMN "Manufacture" FORMAT A30
SQL> SELECT Manuf_ID || ' - ' || Manuf_Name AS "Manufacture"
  2  FROM   Manufacturer
  3  WHERE  REGEXP_LIKE(LOWER(Manuf_Name),'([aeiou]{1})([a-z]{1})\1');

Manufacture
------------------------------
567001 - Motorola
567008 - Piel Frama
567009 - Microsoft
```

```
SQL> --Bonus
SQL> CLEAR COLUMNS
columns cleared
SQL> COLUMN Plan FORMAT A35
SQL> SELECT *
  2  FROM(SELECT Plan_ID || ', ' || start_date || ' - ' || end_date AS Plan,
  3              TO_CHAR(SUM(NVL((BasePrice*(1-DiscountPerc/100))*Period,0)),'$99990.99') AS "Revenue"
  4       FROM   (SELECT Plan_ID, Plan.start_date, Plan.end_date, baseprice, discountperc,
  5                      CEIL(MONTHS_BETWEEN(NVL(contract.end_date, SYSDATE), contract.start_date)) AS Period
  6       FROM Contract RIGHT OUTER JOIN Plan ON Plan.Plan_ID = Contract.vPlan_ID
  7            OR Plan.Plan_ID = Contract.tPlan_ID
  8            OR Plan.Plan_ID = Contract.dPlan_ID)
  9       GROUP BY Plan_ID, start_date, end_date
 10       ORDER BY "Revenue" DESC)
 11  UNION ALL
 12  SELECT 'Total' AS Plan, TO_CHAR(SUM(Revenue), '$99990.99') AS "Revenue"
 13  FROM(SELECT Plan_ID || ', ' || start_date || ' - ' || end_date AS Plan,
 14              SUM(NVL((BasePrice*(1-DiscountPerc/100))*Period,0)) AS Revenue
 15       FROM   (SELECT Plan_ID, Plan.start_date, Plan.end_date, baseprice, discountperc,
 16                      CEIL(MONTHS_BETWEEN(NVL(contract.end_date, SYSDATE), contract.start_date)) AS Period
 17       FROM Contract RIGHT OUTER JOIN Plan ON Plan.Plan_ID = Contract.vPlan_ID
 18            OR Plan.Plan_ID = Contract.tPlan_ID
 19            OR Plan.Plan_ID = Contract.dPlan_ID)
 20       GROUP BY Plan_ID, start_date, end_date);

PLAN                               Revenue
---------------------------------- ----------
109813, 20-NOV-14 - 01-JAN-15         $8476.80
109812, 19-SEP-14 -                   $3694.80
109814, 20-DEC-14 -                   $3518.75
109808, 25-MAY-14 - 04-DEC-14         $3504.00
109815, 01-JAN-15 - 02-JAN-15         $3229.80
109816, 05-JAN-15 -                   $2781.60
109817, 06-FEB-15 - 13-MAR-16         $2216.20
109810, 11-AUG-14 -                   $2042.00
109805, 03-MAR-14 -                   $1720.00
109802, 12-FEB-14 - 11-AUG-14         $1455.00
109801, 02-DEC-13 - 01-DEC-14         $1280.00
109809, 25-MAY-14 - 01-FEB-15         $1158.00
109811, 11-AUG-14 -                    $621.00
109819, 20-FEB-15 -                    $436.50
109804, 01-MAR-14 - 30-APR-14          $378.00
109803, 13-FEB-14 -                    $302.40
109820, 20-FEB-15 -                    $231.84
109818, 17-FEB-15 -                      $0.00
109807, 23-MAR-14 -                      $0.00
109806, 05-MAR-14 - 01-JUN-14            $0.00
Total                                $37046.69

21 rows selected.

SQL> SPOOL OUT
```