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Practical No. :02

Q1. Find the total sales by country_id and channel_desc for the US and GB through the Internet and direct sales in September 2000 and October 2000 using ROLL-UP Extension. The query should return the following:

- The aggregation rows that would be produced by GROUP BY ,
- The First-level subtotals aggregating across country_id for each combination of channel_desc and calendar_month.
- Second-level subtotals aggregating across calendar_month_desc and country_id for each channel_desc value.
- A grand total row.

Query:

```
SELECT
channels.channel_desc,calendar_month_desc,countries.country_iso_code,
       TO_CHAR(SUM(amount_sold),'9,999,999,999')SALES$
         FROM sales,customers,times,channels,countries
         WHERE sales.time_id = times.time_id
         AND sales.cust_id = customers.cust_id
         AND customers.country_id = countries.country_id
         AND sales.channel_id = channels.channel_id
         AND channels.channel_desc IN('Direct Sales','Internet')
         AND times.calendar_month_desc IN('2000-09','2000-10')
         AND countries.country_iso_code IN('GB','US')
         GROUP BY
ROLLUP(channels.channel_desc,calendar_month_desc,countries.country_iso_co
de);
```

Result:

CHANNEL_DESC	CALENDAR	CO	SALES$
Internet	2000-09	GB	16,569
Internet	2000-09	US	124,224
Internet	2000-09		140,793
Internet	2000-10	GB	14,539
Internet	2000-10	US	137,054
Internet	2000-10		151,593
Internet			292,387
Direct Sales	2000-09	GB	85,223
Direct Sales	2000-09	US	638,201
Direct Sales	2000-09		723,424
Direct Sales	2000-10	GB	91,925

CHANNEL_DESC	CALENDAR	CO	SALES$
Direct Sales	2000-10	US	682,297
Direct Sales	2000-10		774,222
Direct Sales			1,497,646
			1,790,032

15 rows selected.

Q2. Find the total sales by country_id and channel_desc for the US and GB through the Internet and direct sales in September 2000 and October 2009 using CUBE aggregation across three dimensions- channel_desc, calendar_month_desc, countries.country_iso_code.

```
Query: SELECT
channels.channel_desc,calendar_month_desc,countries.country_iso_code,
       TO_CHAR(SUM(amount_sold),'9,999,999,999')SALES$
         FROM sales,customers,times,channels,countries
         WHERE sales.time_id = times.time_id
         AND sales.cust_id = customers.cust_id
         AND customers.country_id = countries.country_id
         AND sales.channel_id = channels.channel_id
         AND channels.channel_desc IN('Direct Sales','Internet')
         AND times.calendar_month_desc IN('2000-09','2000-10')
         AND countries.country_iso_code IN('GB','US')
         GROUP BY
CUBE(channels.channel_desc,calendar_month_desc,countries.country_iso_code
);
```

Result:

CHANNEL_DESC	CALENDAR	CO	SALES$
			1,790,032
		GB	208,257
		US	1,581,775
	2000-09		864,217
	2000-09	GB	101,792
	2000-09	US	762,425
	2000-10		925,815
	2000-10	GB	106,465
	2000-10	US	819,351
Internet			292,387
Internet		GB	31,109

CHANNEL_DESC	CALENDAR	CO	SALES$
Internet		US	261,278
Internet	2000-09		140,793
Internet	2000-09	GB	16,569
Internet	2000-09	US	124,224
Internet	2000-10		151,593
Internet	2000-10	GB	14,539
Internet	2000-10	US	137,054
Direct Sales			1,497,646
Direct Sales		GB	177,148
Direct Sales		US	1,320,497
Direct Sales	2000-09		723,424

CHANNEL_DESC	CALENDAR	CO	SALES$
Direct Sales	2000-09	GB	85,223

```
Direct Sales         2000-09  US        638,201
Direct Sales         2000-10            774,222
Direct Sales         2000-10  GB         91,925
Direct Sales         2000-10  US        682,297

27 rows selected.
```

Q3. Find the total sales by country_iso and channel_desc for the US and France
through the Internet and direct sales in September 2000

```
Query: SELECT channels.channel_desc,countries.country_iso_code,
       TO_CHAR(SUM(amount_sold),'9,999,999,999')SALES$
         FROM sales,customers,times,channels,countries
         WHERE sales.time_id = times.time_id
         AND sales.cust_id = customers.cust_id
         AND customers.country_id = countries.country_id
         AND sales.channel_id = channels.channel_id
         AND channels.channel_desc IN('Direct Sales','Internet')
         AND times.calendar_month_desc IN('2000-09')
         AND countries.country_iso_code IN('FR','US')
         GROUP BY CUBE(channels.channel_desc,countries.country_iso_code);
```

Result:

```
CHANNEL_DESC         CO SALES$
-------------------- -- --------------
                                833,224
                     FR          70,799
                     US         762,425
Internet                        133,821
Internet             FR           9,597
Internet             US         124,224
Direct Sales                    699,403
Direct Sales         FR          61,202
Direct Sales         US         638,201

9 rows selected.
```

Q4. Find the total sales by country_id and channel_desc for the US and GB through the Internet and direct sales in September 2000 and October 2009 using PARTIAL ROLL-UP. The query should return the following:

- Regular aggregation rows that would be produced by GROUP BY without using ROLLUP.
- First-level subtotals aggregating across country_id for each combination of channel_desc and calendar_month_desc.
- Second-level subtotals aggregating across calendar_month_desc and country_id for each channel_desc value.
- It does not produce a grand total row.

Query:
```
 SELECT
channels.channel_desc,calendar_month_desc,countries.country_iso_code,
       TO_CHAR(SUM(amount_sold),'9,999,999,999')SALES$
         FROM sales,customers,times,channels,countries
         WHERE sales.time_id = times.time_id
         AND sales.cust_id = customers.cust_id
         AND customers.country_id = countries.country_id
         AND sales.channel_id = channels.channel_id
         AND channels.channel_desc IN('Direct Sales','Internet')
         AND times.calendar_month_desc IN('2000-09','2000-10')
         AND countries.country_iso_code IN('GB','US')
         GROUP BY
channels.channel_desc,ROLLUP(calendar_month_desc,countries.country_iso_co
de);
```

Result:

CHANNEL_DESC	CALENDAR	CO	SALES$
Internet	2000-09	GB	16,569
Internet	2000-09	US	124,224
Internet	2000-09		140,793
Internet	2000-10	GB	14,539
Internet	2000-10	US	137,054
Internet	2000-10		151,593
Internet			292,387
Direct Sales	2000-09	GB	85,223
Direct Sales	2000-09	US	638,201
Direct Sales	2000-09		723,424
Direct Sales	2000-10	GB	91,925

CHANNEL_DESC	CALENDAR	CO	SALES$
Direct Sales	2000-10	US	682,297
Direct Sales	2000-10		774,222
Direct Sales			1,497,646

14 rows selected.

Q5. Find the total sales by country_id and channel_desc for the US and GB through the Internet and direct sales in September 2000 and October 2009 using PARTIAL CUBE aggregation on month and country code and GROUP BY on channel_desc.

Query:
```
SELECT
channels.channel_desc,calendar_month_desc,countries.country_iso_code,
       TO_CHAR(SUM(amount_sold),'9,999,999,999')SALES$
         FROM sales,customers,times,channels,countries
         WHERE sales.time_id = times.time_id
         AND sales.cust_id = customers.cust_id
         AND customers.country_id = countries.country_id
         AND sales.channel_id = channels.channel_id
         AND channels.channel_desc IN('Direct Sales','Internet')
         AND times.calendar_month_desc IN('2000-09','2000-10')
```

```
        AND countries.country_iso_code IN('GB','US')
        GROUP BY
channels.channel_desc,CUBE(calendar_month_desc,countries.country_iso_code
);
```

Result:

CHANNEL_DESC	CALENDAR	CO	SALES$
Internet			292,387
Internet		GB	31,109
Internet		US	261,278
Internet	2000-09		140,793
Internet	2000-09	GB	16,569
Internet	2000-09	US	124,224
Internet	2000-10		151,593
Internet	2000-10	GB	14,539
Internet	2000-10	US	137,054
Direct Sales			1,497,646
Direct Sales		GB	177,148

CHANNEL_DESC	CALENDAR	CO	SALES$
Direct Sales		US	1,320,497
Direct Sales	2000-09		723,424
Direct Sales	2000-09	GB	85,223
Direct Sales	2000-09	US	638,201
Direct Sales	2000-10		774,222
Direct Sales	2000-10	GB	91,925
Direct Sales	2000-10	US	682,297

18 rows selected.

Q6. Use GROUPING to create a set of mask columns for the result set of Q1.

 Create grouping on channel_desc and name it as CH Create grouping calendar_month_desc and name it as MO

 Create grouping on country_iso_code and name it as CO

```
Query:      SELECT channel_desc, calendar_month_desc, country_iso_code,
            TO_CHAR(SUM(amount_sold), '9,999,999,999') SALES$,
            GROUPING(channel_desc) AS Ch,
            GROUPING(calendar_month_desc) AS Mo,
            GROUPING(country_iso_code) AS Co
            FROM sales, customers, times, channels, countries
            WHERE sales.time_id=times.time_id
            AND sales.cust_id=customers.cust_id
            AND customers.country_id = countries.country_id
            AND sales.channel_id= channels.channel_id
            AND channels.channel_desc IN ('Direct Sales', 'Internet')
            AND times.calendar_month_desc IN ('2000-09', '2000-10')
            AND countries.country_iso_code IN ('GB', 'US')
            GROUP BY ROLLUP(channel_desc, calendar_month_desc,
countries.country_iso_code);
```

Result:

CHANNEL_DESC	CALENDAR	CO	SALES$	CH	MO	CO
Internet	2000-09	GB	16,569	0	0	0
Internet	2000-09	US	124,224	0	0	0
Internet	2000-09		140,793	0	0	1
Internet	2000-10	GB	14,539	0	0	0
Internet	2000-10	US	137,054	0	0	0
Internet	2000-10		151,593	0	0	1
Internet			292,387	0	1	1
Direct Sales	2000-09	GB	85,223	0	0	0
Direct Sales	2000-09	US	638,201	0	0	0
Direct Sales	2000-09		723,424	0	0	1
Direct Sales	2000-10	GB	91,925	0	0	0

CHANNEL_DESC	CALENDAR	CO	SALES$	CH	MO	CO
Direct Sales	2000-10	US	682,297	0	0	0
Direct Sales	2000-10		774,222	0	0	1
Direct Sales			1,497,646	0	1	1
			1,790,032	1	1	1

15 rows selected.

Q7. Find the total sales by country_id and channel_desc for the US and GB through the Internet and direct sales in September 2000 and October 2009 using GROUPING SETS.
Calculate aggregates over three groupings:
- (channel_desc, calendar_month_desc, country_iso_code)
- (channel_desc, country_iso_code)
- (calendar_month_desc, country_iso_code)

```
Query:  SELECT channel_desc, calendar_month_desc, country_iso_code,
           TO_CHAR(SUM(amount_sold), '9,999,999,999') SALES$
           FROM sales, customers, times, channels, countries
           WHERE sales.time_id=times.time_id
           AND sales.cust_id=customers.cust_id
           AND customers.country_id = countries.country_id
           AND sales.channel_id= channels.channel_id
           AND channels.channel_desc IN ('Direct Sales', 'Internet')
           AND times.calendar_month_desc IN ('2000-09', '2000-10')
           AND countries.country_iso_code IN ('GB', 'US')
           GROUP BY GROUPING SETS((channel_desc,
calendar_month_desc,country_iso_code),

      (channel_desc,country_iso_code)),(calendar_month_desc,country_iso_c
ode);
```

Result:

CHANNEL_DESC	CALENDAR	CO	SALES$
Internet	2000-09	GB	16,569
Direct Sales	2000-10	US	682,297

```
Direct Sales         2000-09  US        638,201
Internet             2000-10  US        137,054
Direct Sales         2000-09  GB         85,223
Internet             2000-09  US        124,224
Direct Sales         2000-10  GB         91,925
Internet             2000-10  GB         14,539
Internet             2000-09  GB         16,569
Direct Sales         2000-10  US        682,297
Direct Sales         2000-09  US        638,201

CHANNEL_DESC         CALENDAR CO SALES$
-------------------- -------- -- --------------
Internet             2000-10  US        137,054
Direct Sales         2000-09  GB         85,223
Internet             2000-09  US        124,224
Direct Sales         2000-10  GB         91,925
Internet             2000-10  GB         14,539

16 rows selected.
```

Q8. Perform aggregation on amount sold. It should get aggregated by month first,
then by all the months in each quarter, and then across all months and quarters in the year.

```
Query: SELECT calendar_month_desc as MONTH, calendar_quarter_desc as
QUARTER,calendar_year as YEAR,
       TO_CHAR(SUM(amount_sold),'9,999,999,999')SALES$
         FROM sales,times
         WHERE sales.time_id = times.time_id
         AND times.calendar_year IN('1999')
         GROUP BY
ROLLUP(calendar_year,calendar_quarter_desc,calendar_month_desc);
```

Result:

```
MONTH    QUARTER       YEAR SALES$
-------- ------- ---------- --------------
1999-01  1999-01       1999      2,077,440
1999-02  1999-01       1999      2,357,629
1999-03  1999-01       1999      1,658,678
         1999-01       1999      6,093,747
1999-04  1999-02       1999      1,573,273
1999-05  1999-02       1999      1,711,728
1999-06  1999-02       1999      1,640,471
         1999-02       1999      4,925,472
1999-07  1999-03       1999      1,891,216
1999-08  1999-03       1999      1,904,917
1999-09  1999-03       1999      2,030,918

MONTH    QUARTER       YEAR SALES$
-------- ------- ---------- --------------
         1999-03       1999      5,827,050
1999-10  1999-04       1999      1,722,615
```

```
1999-11  1999-04       1999      1,719,132
1999-12  1999-04       1999      1,931,931
         1999-04       1999      5,373,679
                       1999     22,219,948
                                22,219,948

18 rows selected.
```

Q9. Implement concatenated rollup. First roll up on (channel_total, channel_class)
and second roll up on(country_region and country_iso_code)

Query:

```
SELECT
channels.channel_total,channels.channel_class,countries.country_region,co
untries.country_iso_code,
       TO_CHAR(SUM(amount_sold),'9,999,999,999')SALES$
         FROM sales,customers,times,channels,countries
         WHERE sales.time_id = times.time_id
         AND sales.cust_id = customers.cust_id
         AND customers.country_id = countries.country_id
         AND sales.channel_id = channels.channel_id
         AND times.calendar_month_desc IN('2001-09','2001-10')
         AND countries.country_iso_code IN('GB','US')
         GROUP BY
ROLLUP(channel_total,channel_class),ROLLUP(country_region,countries.count
ry_iso_code);
```

Result:

```
CHANNEL_TOTAL CHANNEL_CLASS        COUNTRY_REGION       CO SALES$
------------- -------------------- -------------------- -- --------------
                                   Europe               GB        321,244
                                   Europe                         321,244
                                   Americas             US      2,603,473
                                   Americas                     2,603,473
                                                                2,924,717
Channel total                      Europe               GB        321,244
Channel total                      Europe                         321,244
Channel total                      Americas             US      2,603,473
Channel total                      Americas                     2,603,473
Channel total                                                   2,924,717
Channel total Direct               Europe               GB        168,161

CHANNEL_TOTAL CHANNEL_CLASS        COUNTRY_REGION       CO SALES$
------------- -------------------- -------------------- -- --------------
Channel total Direct               Europe                         168,161
Channel total Direct               Americas             US      1,187,918
Channel total Direct               Americas                     1,187,918
Channel total Direct                                            1,356,079
Channel total Others               Europe               GB         77,265
Channel total Others               Europe                          77,265
Channel total Others               Americas             US        729,606
Channel total Others               Americas                       729,606
Channel total Others                                              806,872
Channel total Indirect             Europe               GB         75,817
```

```
Channel total Indirect            Europe                          75,817

CHANNEL_TOTAL CHANNEL_CLASS       COUNTRY_REGION       CO SALES$
------------- ------------------- -------------------- -- --------------
Channel total Indirect            Americas             US        685,949
Channel total Indirect            Americas                       685,949
Channel total Indirect                                           761,766

25 rows selected.
```

Q10. Consider the following Query and make conclusion from the result obtained.

```
Query:      SELECT deptno, job, SUM(sal)
            FROM emp
            GROUP BY CUBE(deptno, job);
Result:
    DEPTNO JOB         SUM(SAL)
---------- --------- ----------
                          29025
           CLERK           4150
           ANALYST         6000
           MANAGER         8275
           SALESMAN        5600
           PRESIDENT       5000
        10                 8750
        10 CLERK           1300
        10 MANAGER         2450
        10 PRESIDENT       5000
        20                10875

    DEPTNO JOB         SUM(SAL)
---------- --------- ----------
        20 CLERK           1900
        20 ANALYST         6000
        20 MANAGER         2975
        30                 9400
        30 CLERK            950
        30 MANAGER         2850
        30 SALESMAN        5600

18 rows selected.
```

Q11. Find the total sales by country name and channel_desc for the country name starting from U through the Internet and direct sales in September 2000 and October.

6

```
Query: SELECT countries.country_name,channels.channel_desc,
       TO_CHAR(SUM(amount_sold),'9,999,999,999')SALES$
         FROM sales,customers,times,channels,countries
         WHERE sales.time_id = times.time_id
         AND sales.cust_id = customers.cust_id
         AND customers.country_id = countries.country_id
         AND sales.channel_id = channels.channel_id
         AND channels.channel_desc IN ('Direct Sales', 'Internet')
```

```
        AND times.calendar_month_desc IN('2000-09','2000-10')
        AND countries.country_name LIKE 'U%'
        GROUP BY ROLLUP(channels.channel_desc,countries.country_name);
```

Result:

COUNTRY_NAME	CHANNEL_DESC	SALES$
United Kingdom	Internet	31,109
United States of America	Internet	261,278
	Internet	292,387
United Kingdom	Direct Sales	177,148
United States of America	Direct Sales	1,320,497
	Direct Sales	1,497,646
		1,790,032

7 rows selected.

Q12. Find the total sales by country name and channel_desc for the country name
starting from U through the Internet and direct sales in September 2000 and October
using GROUPING ID.

```
Query:  SELECT ch.channel_desc, t.calendar_month_desc,
co.country_iso_code,
           SUM(s.amount_sold) sum_amount_sold,
           GROUPING_ID( ch.channel_desc, t.calendar_month_desc,
co.country_iso_code) grouping_id
           FROM sales s, customers cu, times t, channels ch, countries
co
           WHERE s.time_id=t.time_id
           AND s.cust_id=cu.cust_id
           AND cu.country_id = co.country_id
           AND s.channel_id = ch.channel_id
           AND ch.channel_desc IN ('Direct Sales', 'Internet')
           AND t.calendar_month_desc IN ('2001-09', '2001-10')
           AND co.country_iso_code IN ('GB', 'US')
           GROUP BY ROLLUP( ch.channel_desc, t.calendar_month_desc,
co.country_iso_code);
```

Result:

CHANNEL_DESC	CALENDAR	CO	SUM_AMOUNT_SOLD	GROUPING_ID
Internet	2001-09	GB	36806.73	0
Internet	2001-09	US	299621.96	0
Internet	2001-09		336428.69	1
Internet	2001-10	GB	39010.76	0
Internet	2001-10	US	386326.55	0
Internet	2001-10		425337.31	1
Internet			761766	3
Direct Sales	2001-09	GB	92865.04	0
Direct Sales	2001-09	US	621197.94	0
Direct Sales	2001-09		714062.98	1
Direct Sales	2001-10	GB	75296.44	0

```
CHANNEL_DESC         CALENDAR CO SUM_AMOUNT_SOLD GROUPING_ID
-------------------- -------- -- --------------- -----------
Direct Sales         2001-10  US        566719.8           0
Direct Sales         2001-10            642016.24           1
Direct Sales                           1356079.22           3
                                       2117845.22           7
15 rows selected.
```