

PRACTICAL NO 2:

AIM: WRITE AND EXECUTE SQL AGGREGATION QUERIES FOR DATA WAREHOUSE.

SQL> select count(*) from sales;

```
COUNT(*)
-----
918843
```

SQL> select count(*) from products;

```
COUNT(*)
-----
72
```

SQL> select * from sales
2 where rownum<10;

| PROD_ID | CUST_ID | TIME_ID | CHANNEL_ID | PROMO_ID | QUANTITY_SOLD | AMOUNT_SOLD |
|---------|---------|-----------|------------|----------|---------------|-------------|
| 13 | 987 | 10-JAN-98 | 3 | 999 | 1 | 1232.16 |
| 13 | 1660 | 10-JAN-98 | 3 | 999 | 1 | 1232.16 |
| 13 | 1762 | 10-JAN-98 | 3 | 999 | 1 | 1232.16 |
| 13 | 1843 | 10-JAN-98 | 3 | 999 | 1 | 1232.16 |
| 13 | 1948 | 10-JAN-98 | 3 | 999 | 1 | 1232.16 |
| 13 | 2273 | 10-JAN-98 | 3 | 999 | 1 | 1232.16 |
| 13 | 2380 | 10-JAN-98 | 3 | 999 | 1 | 1232.16 |
| 13 | 2683 | 10-JAN-98 | 3 | 999 | 1 | 1232.16 |
| 13 | 2865 | 10-JAN-98 | 3 | 999 | 1 | 1232.16 |

9 rows selected.

QUERY 1:

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.

```
SQL> SELECT channels.channel_desc, calendar_month_desc,
2 countries.country_iso_code,
3 TO_CHAR(SUM(amount_sold), '9,999,999,999') SALES$
4 FROM sales, customers, times, channels, countries
5 WHERE sales.time_id=times.time_id
6 AND sales.cust_id=customers.cust_id
7 AND customers.country_id = countries.country_id
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8 AND sales.channel_id = channels.channel_id
9 AND channels.channel_desc IN ('Direct Sales', 'Internet')
10 AND times.calendar_month_desc IN ('2000-09', '2000-10')
11 AND countries.country_iso_code IN ('GB', 'US')
12 GROUP BY
13 ROLLUP(channels.channel_desc, calendar_month_desc,
14 countries.country_iso_code);

```

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
Direct Sales              1,790,032

```

15 rows selected.

QUERY 2:

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.

```

SQL> SELECT channels.channel_desc, calendar_month_desc,
2 countries.country_iso_code,
3 TO_CHAR(SUM(amount_sold), '9,999,999,999') SALES$
4 FROM sales, customers, times, channels, countries
5 WHERE sales.time_id=times.time_id
6 AND sales.cust_id=customers.cust_id
7 AND customers.country_id = countries.country_id
8 AND sales.channel_id = channels.channel_id
9 AND channels.channel_desc IN ('Direct Sales', 'Internet')
10 AND times.calendar_month_desc IN ('2000-09', '2000-10')
11 AND countries.country_iso_code IN ('GB', 'US')
12 GROUP BY
13 CUBE(channels.channel_desc, calendar_month_desc, countries.country_iso_code)
14 ORDER BY channels.channel_desc;

```

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CHANNEL_DESC CALENDAR CO SALES\$

```

-----
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
Direct Sales 2000-10 US 682,297
Direct Sales 2000-10 774,222
Direct Sales GB 177,148
Direct Sales US 1,320,497
Direct Sales 1,497,646
Internet 2000-09 GB 16,569
Internet 2000-09 US 124,224

```

CHANNEL_DESC CALENDAR CO SALES\$

```

-----
Internet 2000-09 140,793
Internet 2000-10 GB 14,539
Internet 2000-10 US 137,054
Internet 2000-10 151,593
Internet GB 31,109
Internet US 261,278
Internet 292,387
Internet 2000-09 GB 101,792
Internet 2000-09 US 762,425
Internet 2000-09 864,217
Internet 2000-10 GB 106,465

```

CHANNEL_DESC CALENDAR CO SALES\$

```

-----
2000-10 US 819,351
2000-10 925,815
GB 208,257
US 1,581,775
1,790,032

```

27 rows selected.

QUERY 3:

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

```

SQL> SELECT channels.channel_desc,countries.country_iso_code,
2 TO_CHAR(SUM(amount_sold), '9,999,999,999') SALES$
3 FROM sales, customers, times, channels, countries
4 WHERE sales.time_id=times.time_id
5 AND sales.cust_id=customers.cust_id
6 AND customers.country_id = countries.country_id
7 AND sales.channel_id = channels.channel_id
8 AND channels.channel_desc IN ('Direct Sales', 'Internet')
9 AND times.calendar_month_desc IN ('2000-09')
10 AND countries.country_iso_code IN ('FR', 'US')

```

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11 GROUP BY

12 ROLLUP(channels.channel_desc,calendar_month_desc,countries.country_iso_code)

13 ORDER BY channels.channel_desc;

| CHANNEL_DESC | | CO SALE\$ |
|--------------|----|-----------|
| Direct Sales | FR | 61,202 |
| Direct Sales | US | 638,201 |
| Direct Sales | | 699,403 |
| Direct Sales | | 699,403 |
| Internet | FR | 9,597 |
| Internet | US | 124,224 |
| Internet | | 133,821 |
| Internet | | 133,821 |
| | | 833,224 |

9 rows selected.

QUERY 4:

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.

```
SQL> SELECT channels.channel_desc, calendar_month_desc,
2 countries.country_iso_code,
3 TO_CHAR(SUM(amount_sold), '9,999,999,999') SALES$
4 FROM sales, customers, times, channels, countries
5 WHERE sales.time_id=times.time_id
6 AND sales.cust_id=customers.cust_id
7 AND customers.country_id = countries.country_id
8 AND sales.channel_id = channels.channel_id
9 AND channels.channel_desc IN ('Direct Sales', 'Internet')
10 AND times.calendar_month_desc IN ('2000-09', '2000-10')
11 AND countries.country_iso_code IN ('GB', 'US')
12 GROUP BY
13 channel_desc,
14 ROLLUP(
15 countries.country_iso_code, calendar_month_desc);
```

| CHANNEL_DESC | CALENDAR | CO | SALES\$ |
|--------------|----------|----|---------|
| Internet | 2000-09 | GB | 16,569 |
| Internet | 2000-10 | GB | 14,539 |
| Internet | | GB | 31,109 |

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| | | | |
|--------------|---------|----|---------|
| Internet | 2000-09 | US | 124,224 |
| Internet | 2000-10 | US | 137,054 |
| Internet | | US | 261,278 |
| Internet | | | 292,387 |
| Direct Sales | 2000-09 | GB | 85,223 |
| Direct Sales | 2000-10 | GB | 91,925 |
| Direct Sales | | GB | 177,148 |
| Direct Sales | 2000-09 | US | 638,201 |

| CHANNEL_DESC | CALENDAR | CO | SALES\$ |
|--------------|----------|-------|-----------|
| ----- | ----- | ----- | ----- |
| Direct Sales | 2000-10 | US | 682,297 |
| Direct Sales | | US | 1,320,497 |
| Direct Sales | | | 1,497,646 |

14 rows selected.

```
SQL> 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
  country_iso_code,
  ROLLUP(
  channels.channel_desc, calendar_month_desc
  );
```

| CHANNEL_DESC | CALENDAR | CO | SALES\$ |
|--------------|----------|-------|---------|
| ----- | ----- | ----- | ----- |
| Internet | 2000-09 | GB | 16,569 |
| Internet | 2000-10 | GB | 14,539 |
| Internet | | GB | 31,109 |
| Direct Sales | 2000-09 | GB | 85,223 |
| Direct Sales | 2000-10 | GB | 91,925 |
| Direct Sales | | GB | 177,148 |
| | | GB | 208,257 |
| Internet | 2000-09 | US | 124,224 |
| Internet | 2000-10 | US | 137,054 |
| Internet | | US | 261,278 |
| Direct Sales | 2000-09 | US | 638,201 |

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CHANNEL_DESC CALENDAR CO SALES\$

```
-----
Direct Sales    2000-10  US    682,297
Direct Sales           US    1,320,497
                  US    1,581,775
```

14 rows selected.

QUERY 5:

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.

```
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
channel_desc,
CUBE(countries.country_iso_code, calendar_month_desc);
```

CHANNEL_DESC CALENDAR CO SALES\$

```
-----
Internet                292,387
Internet    2000-09      140,793
Internet    2000-10      151,593
Internet                GB    31,109
Internet    2000-09 GB    16,569
Internet    2000-10 GB    14,539
Internet                US    261,278
Internet    2000-09 US    124,224
Internet    2000-10 US    137,054
Direct Sales           1,497,646
Direct Sales    2000-09      723,424
```

CHANNEL_DESC CALENDAR CO SALES\$

```
-----
Direct Sales    2000-10      774,222
Direct Sales           GB    177,148
Direct Sales    2000-09 GB     85,223
Direct Sales    2000-10 GB     91,925
Direct Sales           US    1,320,497
Direct Sales    2000-09 US     638,201
Direct Sales    2000-10 US     682,297
```

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18 rows selected.

QUERY 6:

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

```
SQL> SELECT channels.channel_desc, calendar_month_desc,
       countries.country_iso_code,
       GROUPING(channel_desc) as CH,
       GROUPING(calendar_month_desc) as MO,
       GROUPING(country_iso_code) as CO,
       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_code);
```

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

| CHANNEL_DESC | CALENDAR CO | | CH | MO | CO SALES\$ |
|--------------|-------------|----|----|----|------------|
| Direct Sales | 2000-10 | US | 0 | 0 | 0 |
| Direct Sales | 2000-10 | | 0 | 0 | 1 |
| Direct Sales | | | 0 | 1 | 1 |
| | | | 1 | 1 | 1 |

15 rows selected.

QUERY 7:

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)

```
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
GROUPING SETS((channels.channel_desc, calendar_month_desc,
               countries.country_iso_code),(channel_desc,
               country_iso_code),(calendar_month_desc,
               country_iso_code));
```

CHANNEL_DESC CALENDAR CO SALES\$

```
-----
Internet      2000-09   GB      16,569
Direct Sales  2000-09   GB      85,223
Internet      2000-09   US     124,224
Direct Sales  2000-09   US     638,201
Internet      2000-10   GB      14,539
Direct Sales  2000-10   GB      91,925
Internet      2000-10   US     137,054
Direct Sales  2000-10   US     682,297
              2000-09   GB      101,792
              2000-09   US      762,425
              2000-10   GB      106,465
```

CHANNEL_DESC CALENDAR CO SALES\$

```
-----
              2000-10   US      819,351
Direct Sales              GB      177,148
Internet                GB      31,109
Direct Sales              US     1,320,497
Internet                US      261,278
```

16 rows selected.

QUERY 8:

Q: 8 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.

```
SQL> SELECT times.calendar_month_desc,times.calendar_quarter_number,times.calendar_year,
SUM(AMOUNT_SOLD) AS 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_year='1999'
AND countries.country_iso_code IN ('GB', 'US')
GROUP BY
ROLLUP(times.calendar_year,times.calendar_quarter_number,times.calendar_month_desc);
```

| CALENDAR | CALENDAR_QUARTER_NUMBER | CALENDAR_YEAR | SALES |
|----------|-------------------------|---------------|------------|
| 1999-01 | 1 | 1999 | 974627.95 |
| 1999-02 | 1 | 1999 | 1089255.92 |
| 1999-03 | 1 | 1999 | 754026.7 |
| | 1 | 1999 | 2817910.57 |
| 1999-04 | 2 | 1999 | 708060.57 |
| 1999-05 | 2 | 1999 | 818055.52 |
| 1999-06 | 2 | 1999 | 729677.52 |
| | 2 | 1999 | 2255793.61 |
| 1999-07 | 3 | 1999 | 893452.47 |
| 1999-08 | 3 | 1999 | 883460.92 |
| 1999-09 | 3 | 1999 | 923577.01 |

| | | | |
|---------|---|------|------------|
| | 3 | 1999 | 2700490.4 |
| 1999-10 | 4 | 1999 | 715831.36 |
| 1999-11 | 4 | 1999 | 742248.42 |
| 1999-12 | 4 | 1999 | 841572.17 |
| | 4 | 1999 | 2299651.95 |
| | | 1999 | 10073846.5 |
| | | | 10073846.5 |

| CALENDAR | CALENDAR_QUARTER_NUMBER | CALENDAR_YEAR | SALES |
|----------|-------------------------|---------------|------------|
| 1999-01 | 1 | 1999 | 974627.95 |
| 1999-02 | 1 | 1999 | 1089255.92 |
| 1999-03 | 1 | 1999 | 754026.7 |
| | 1 | 1999 | 2817910.57 |
| 1999-04 | 2 | 1999 | 708060.57 |
| 1999-05 | 2 | 1999 | 818055.52 |
| 1999-06 | 2 | 1999 | 729677.52 |
| | 2 | 1999 | 2255793.61 |
| 1999-07 | 3 | 1999 | 893452.47 |
| 1999-08 | 3 | 1999 | 883460.92 |
| 1999-09 | 3 | 1999 | 923577.01 |

| | | | |
|---------|---|------|------------|
| | 3 | 1999 | 2700490.4 |
| 1999-10 | 4 | 1999 | 715831.36 |
| 1999-11 | 4 | 1999 | 742248.42 |
| 1999-12 | 4 | 1999 | 841572.17 |
| | 4 | 1999 | 2299651.95 |
| | | 1999 | 10073846.5 |
| | | | 10073846.5 |

18 rows selected.

QUERY 9:

Q: 9 Implement concatenated rollup. First roll up on (channel_total, channel_class) and second roll up on(country_region and country_iso_code)

```
SELECT channels.channel_total, channels.channel_class,
countries.country_iso_code,countries.country_region,
TO_CHAR(SUM(amount_sold), '9,999,999,999') SALES$
FROM sales, customers, times, channels, countries
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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,country_iso_code);

```

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

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

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

25 rows selected.

QUERY 10:

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

Query: (scott Schema)

```

SELECT deptno, job, SUM(sal) FROM emp
GROUP BY CUBE(deptno, job)

```

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```
SQL> SELECT deptno, job, SUM(sal)
FROM emp
GROUP BY CUBE(deptno, job);
```

| 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.

QUERY 11:

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.

```
SQL> SELECT channels.channel_desc, calendar_month_desc,
       countries.country_name,
       TO_CHAR(SUM(amount_sold), '9,999,999,999') SALES$
FROM sales, customers, times, channels, countries
WHERE country_name like 'U%'
AND 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_name);
```

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| CHANNEL_DESC | CALENDAR | COUNTRY_NAME | SALES\$ |
|--------------|----------|--------------------------|---------|
| Internet | 2000-09 | United Kingdom | 16,569 |
| Internet | 2000-09 | United States of America | 124,224 |
| Internet | 2000-09 | | 140,793 |

| CHANNEL_DESC | CALENDAR | COUNTRY_NAME | SALES\$ |
|--------------|----------|--------------------------|---------|
| Internet | 2000-10 | United Kingdom | 14,539 |
| Internet | 2000-10 | United States of America | 137,054 |
| Internet | 2000-10 | | 151,593 |

| CHANNEL_DESC | CALENDAR | COUNTRY_NAME | SALES\$ |
|--------------|----------|--------------------------|---------|
| Internet | | | 292,387 |
| Direct Sales | 2000-09 | United Kingdom | 85,223 |
| Direct Sales | 2000-09 | United States of America | 638,201 |

| CHANNEL_DESC | CALENDAR | COUNTRY_NAME | SALES\$ |
|--------------|----------|--------------------------|---------|
| Direct Sales | 2000-09 | | 723,424 |
| Direct Sales | 2000-10 | United Kingdo | 91,925 |
| Direct Sales | 2000-10 | United States of America | 682,297 |

| CHANNEL_DESC | CALENDAR | COUNTRY_NAME | SALES\$ |
|--------------|----------|--------------|-----------|
| Direct Sales | 2000-10 | | 774,222 |
| Direct Sales | | | 1,497,646 |
| | | | 1,790,032 |

15 rows selected.

QUERY 12:

Q12. Analyze the output

```
SQL> SELECT
  2 ch.channel_desc,
  3 t.calendar_month_desc,
  4 co.country_iso_code,
  5 SUM(s.amount_sold) sum_amount_sold,
  6 GROUPING_ID(
  7 ch.channel_desc,
```

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```

8 t.calendar_month_desc,
9 co.country_iso_code) grouping_id
10 FROM
11 sales s,
12 customers cu,
13 times t,
14 channels ch,
15 countries co
16 WHERE
17 s.time_id=t.time_id AND
18 s.cust_id=cu.cust_id AND
19 cu.country_id = co.country_id AND
20 s.channel_id = ch.channel_id AND
21 ch.channel_desc IN ('Direct Sales', 'Internet') AND
22 t.calendar_month_desc IN ('2001-09', '2001-10') AND
23 co.country_iso_code IN ('GB', 'US')
24 GROUP BY
25 ROLLUP(
26 ch.channel_desc,
27 t.calendar_month_desc,
28 co.country_iso_code);

```

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.

```

-----
SELECT
ch.channel_desc,
t.calendar_month_desc,
co.country_iso_code,
SUM(s.amount_sold) sum_amount_sold
FROM

```

PRACTICAL NO 2

```

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),
ROLLUP(
ch.channel_desc,
t.calendar_month_desc,
co.country_iso_code)
ORDER BY group_id();

```

CHANNEL_DESC CALENDAR CO SUM_AMOUNT_SOLD

```

-----
Internet      2001-10      425337.31
Direct Sales   2001-10      642016.24
Direct Sales   2001-09      714062.98
Internet      2001-09      336428.69
Internet      2001-09 GB      36806.73
Internet      2001-09 US      299621.96
Internet      2001-10 GB      39010.76
Internet      2001-10 US      386326.55
Direct Sales   2001-09 GB      92865.04
Direct Sales   2001-09 US      621197.94
Direct Sales   2001-10 GB      75296.44

```

CHANNEL_DESC CALENDAR CO SUM_AMOUNT_SOLD

```

-----
Direct Sales   2001-10 US      566719.8
Internet                               761766
Direct Sales                               1356079.22
                               2117845.22
Internet                               761766
Direct Sales                               1356079.22
Internet      2001-10      425337.31
Direct Sales   2001-10      642016.24
Direct Sales   2001-09      714062.98
Internet      2001-09      336428.69

```

PRACTICAL NO 2

Direct Sales 2001-10 US 566719.8

CHANNEL_DESC CALENDAR CO SUM_AMOUNT_SOLD

```

-----
Internet      2001-09 US    299621.96
Internet      2001-10 GB    39010.76
Internet      2001-10 US    386326.55
Direct Sales  2001-09 GB    92865.04
Direct Sales  2001-09 US    621197.94
Direct Sales  2001-10 GB    75296.44
Internet      2001-09 GB    36806.73
Internet      761766
Direct Sales  1356079.22
Internet      2001-10    425337.31
Direct Sales  2001-10    642016.24

```

CHANNEL_DESC CALENDAR CO SUM_AMOUNT_SOLD

```

-----
Direct Sales  2001-09    714062.98
Internet      2001-09    336428.69
Internet      2001-09 GB    36806.73
Internet      2001-09 US    299621.96
Internet      2001-10 GB    39010.76
Internet      2001-10 US    386326.55
Direct Sales  2001-09 GB    92865.04
Direct Sales  2001-09 US    621197.94
Direct Sales  2001-10 GB    75296.44
Direct Sales  2001-10 US    566719.8
Internet      2001-09 GB    36806.73

```

CHANNEL_DESC CALENDAR CO SUM_AMOUNT_SOLD

```

-----
Internet      2001-09 US    299621.96
Internet      2001-10 GB    39010.76
Direct Sales  2001-10 US    566719.8
Internet      2001-10    425337.31
Internet      2001-10 US    386326.55
Direct Sales  2001-09    714062.98
Internet      2001-09    336428.69
Direct Sales  2001-10 GB    75296.44
Direct Sales  2001-09 US    621197.94
Direct Sales  2001-09 GB    92865.04
Direct Sales  2001-10    642016.24

```

CHANNEL_DESC CALENDAR CO SUM_AMOUNT_SOLD

```

-----
Internet      2001-09    336428.69
Direct Sales  2001-09    714062.98
Internet      2001-10    425337.31
Direct Sales  2001-10    642016.24
Direct Sales  2001-10 US    566719.8

```

PRACTICAL NO 2

| | | | |
|--------------|---------|----|-----------|
| Direct Sales | 2001-10 | GB | 75296.44 |
| Direct Sales | 2001-09 | US | 621197.94 |
| Direct Sales | 2001-09 | GB | 92865.04 |
| Internet | 2001-10 | US | 386326.55 |
| Internet | 2001-10 | GB | 39010.76 |
| Internet | 2001-09 | US | 299621.96 |

| CHANNEL_DESC | CALENDAR | CO | SUM_AMOUNT_SOLD |
|--------------|----------|-------|-----------------|
| ----- | ----- | ----- | ----- |
| Internet | 2001-09 | GB | 36806.73 |
| Direct Sales | 2001-10 | US | 566719.8 |
| Internet | 2001-09 | GB | 36806.73 |
| Internet | 2001-09 | US | 299621.96 |
| Internet | 2001-10 | GB | 39010.76 |
| Internet | 2001-10 | US | 386326.55 |
| Direct Sales | 2001-09 | GB | 92865.04 |
| Direct Sales | 2001-09 | US | 621197.94 |
| Direct Sales | 2001-10 | GB | 75296.44 |
| Direct Sales | 2001-10 | US | 566719.8 |
| Internet | 2001-09 | US | 299621.96 |

| | | | |
|--------------|---------|-------|-----------|
| ----- | ----- | ----- | ----- |
| Internet | 2001-10 | GB | 39010.76 |
| Internet | 2001-10 | US | 386326.55 |
| Direct Sales | 2001-09 | GB | 92865.04 |
| Direct Sales | 2001-09 | US | 621197.94 |
| Direct Sales | 2001-10 | GB | 75296.44 |
| Internet | 2001-09 | GB | 36806.73 |

| CHANNEL_DESC | CALENDAR | CO | SUM_AMOUNT_SOLD |
|--------------|----------|-------|-----------------|
| ----- | ----- | ----- | ----- |
| Internet | 2001-10 | GB | 39010.76 |
| Internet | 2001-10 | US | 386326.55 |
| Direct Sales | 2001-09 | GB | 92865.04 |
| Direct Sales | 2001-09 | US | 621197.94 |
| Direct Sales | 2001-10 | GB | 75296.44 |
| Internet | 2001-09 | GB | 36806.73 |

83 rows selected.

83 rows selected.

```

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

```


PRACTICAL NO 2

```

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),
ROLLUP(
ch.channel_desc,
t.calendar_month_desc,
co.country_iso_code)
ORDER BY group_id();

```

| CHANNEL_DESC | CALENDAR | CO | SUM_AMOUNT_SOLD | GROUPING_ID |
|--------------|----------|----|-----------------|-------------|
| Internet | 2001-10 | | 425337.31 | 1 |
| Direct Sales | 2001-10 | | 642016.24 | 1 |
| Direct Sales | 2001-09 | | 714062.98 | 1 |
| Internet | 2001-09 | | 336428.69 | 1 |
| Internet | 2001-09 | GB | 36806.73 | 0 |
| Internet | 2001-09 | US | 299621.96 | 0 |
| Internet | 2001-10 | GB | 39010.76 | 0 |
| Internet | 2001-10 | US | 386326.55 | 0 |
| Direct Sales | 2001-09 | GB | 92865.04 | 0 |
| Direct Sales | 2001-09 | US | 621197.94 | 0 |
| 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 |
| Internet | | | 761766 | 3 |
| Direct Sales | | | 1356079.22 | 3 |
| | | | 2117845.22 | 7 |
| Internet | | | 761766 | 3 |
| Direct Sales | | | 1356079.22 | 3 |
| Internet | 2001-10 | | 425337.31 | 1 |
| Direct Sales | 2001-10 | | 642016.24 | 1 |
| Direct Sales | 2001-09 | | 714062.98 | 1 |
| Internet | 2001-09 | | 336428.69 | 1 |
| Direct Sales | 2001-10 | US | 566719.8 | 0 |

| CHANNEL_DESC | CALENDAR | CO | SUM_AMOUNT_SOLD | GROUPING_ID |
|--------------|----------|----|-----------------|-------------|
| Internet | 2001-09 | US | 299621.96 | 0 |
| Internet | 2001-10 | GB | 39010.76 | 0 |
| Internet | 2001-10 | US | 386326.55 | 0 |
| Direct Sales | 2001-09 | GB | 92865.04 | 0 |
| Direct Sales | 2001-09 | US | 621197.94 | 0 |
| Direct Sales | 2001-10 | GB | 75296.44 | 0 |

PRACTICAL NO 2

| | | | | |
|--------------|---------|----|------------|---|
| Internet | 2001-09 | GB | 36806.73 | 0 |
| Internet | | | 761766 | 3 |
| Direct Sales | | | 1356079.22 | 3 |
| Internet | 2001-10 | | 425337.31 | 1 |
| Direct Sales | 2001-10 | | 642016.24 | 1 |

| CHANNEL_DESC | CALENDAR | CO | SUM_AMOUNT_SOLD | GROUPING_ID |
|--------------|----------|----|-----------------|-------------|
|--------------|----------|----|-----------------|-------------|

| | | | | |
|--------------|---------|----|-----------|---|
| Direct Sales | 2001-09 | | 714062.98 | 1 |
| Internet | 2001-09 | | 336428.69 | 1 |
| Internet | 2001-09 | GB | 36806.73 | 0 |
| Internet | 2001-09 | US | 299621.96 | 0 |
| Internet | 2001-10 | GB | 39010.76 | 0 |
| Internet | 2001-10 | US | 386326.55 | 0 |
| Direct Sales | 2001-09 | GB | 92865.04 | 0 |
| Direct Sales | 2001-09 | US | 621197.94 | 0 |
| Direct Sales | 2001-10 | GB | 75296.44 | 0 |
| Direct Sales | 2001-10 | US | 566719.8 | 0 |
| Internet | 2001-09 | GB | 36806.73 | 0 |

| CHANNEL_DESC | CALENDAR | CO | SUM_AMOUNT_SOLD | GROUPING_ID |
|--------------|----------|----|-----------------|-------------|
|--------------|----------|----|-----------------|-------------|

| | | | | |
|--------------|---------|----|-----------|---|
| Internet | 2001-09 | US | 299621.96 | 0 |
| Internet | 2001-10 | GB | 39010.76 | 0 |
| Direct Sales | 2001-10 | US | 566719.8 | 0 |
| Internet | 2001-10 | | 425337.31 | 1 |
| Internet | 2001-10 | US | 386326.55 | 0 |
| Direct Sales | 2001-09 | | 714062.98 | 1 |
| Internet | 2001-09 | | 336428.69 | 1 |
| Direct Sales | 2001-10 | GB | 75296.44 | 0 |
| Direct Sales | 2001-09 | US | 621197.94 | 0 |
| Direct Sales | 2001-09 | GB | 92865.04 | 0 |
| Direct Sales | 2001-10 | | 642016.24 | 1 |

| CHANNEL_DESC | CALENDAR | CO | SUM_AMOUNT_SOLD | GROUPING_ID |
|--------------|----------|----|-----------------|-------------|
|--------------|----------|----|-----------------|-------------|

| | | | | |
|--------------|---------|----|-----------|---|
| Internet | 2001-09 | | 336428.69 | 1 |
| Direct Sales | 2001-09 | | 714062.98 | 1 |
| Internet | 2001-10 | | 425337.31 | 1 |
| Direct Sales | 2001-10 | | 642016.24 | 1 |
| Direct Sales | 2001-10 | US | 566719.8 | 0 |
| Direct Sales | 2001-10 | GB | 75296.44 | 0 |
| Direct Sales | 2001-09 | US | 621197.94 | 0 |
| Direct Sales | 2001-09 | GB | 92865.04 | 0 |
| Internet | 2001-10 | US | 386326.55 | 0 |
| Internet | 2001-10 | GB | 39010.76 | 0 |
| Internet | 2001-09 | US | 299621.96 | 0 |

| CHANNEL_DESC | CALENDAR | CO | SUM_AMOUNT_SOLD | GROUPING_ID |
|--------------|----------|----|-----------------|-------------|
|--------------|----------|----|-----------------|-------------|

| | | | | |
|----------|---------|----|----------|---|
| Internet | 2001-09 | GB | 36806.73 | 0 |
|----------|---------|----|----------|---|

PRACTICAL NO 2

| | | | | |
|--------------|---------|----|-----------|---|
| Direct Sales | 2001-10 | US | 566719.8 | 0 |
| Internet | 2001-09 | GB | 36806.73 | 0 |
| Internet | 2001-09 | US | 299621.96 | 0 |
| Internet | 2001-10 | GB | 39010.76 | 0 |
| Internet | 2001-10 | US | 386326.55 | 0 |
| Direct Sales | 2001-09 | GB | 92865.04 | 0 |
| Direct Sales | 2001-09 | US | 621197.94 | 0 |
| Direct Sales | 2001-10 | GB | 75296.44 | 0 |
| Direct Sales | 2001-10 | US | 566719.8 | 0 |
| Internet | 2001-09 | US | 299621.96 | 0 |

| CHANNEL_DESC | CALENDAR | CO | SUM_AMOUNT_SOLD | GROUPING_ID |
|--------------|----------|----|-----------------|-------------|
|--------------|----------|----|-----------------|-------------|

| | | | | |
|--------------|---------|----|-----------|---|
| Internet | 2001-10 | GB | 39010.76 | 0 |
| Internet | 2001-10 | US | 386326.55 | 0 |
| Direct Sales | 2001-09 | GB | 92865.04 | 0 |
| Direct Sales | 2001-09 | US | 621197.94 | 0 |
| Direct Sales | 2001-10 | GB | 75296.44 | 0 |
| Internet | 2001-09 | GB | 36806.73 | 0 |

83 rows selected.