PRACTICAL 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);

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.

```
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 AND sales.cust_id=customers.cust_id
AND
  5       sales.channel_id= channels.channel_id AND channels.channel_desc IN
  6       ('Direct Sales', 'Internet') AND times.calendar_month_desc='2000-09'
  7       AND customers.country_id=countries.country_id
  8       AND countries.country_iso_code IN ('US','FR')
  9       GROUP BY CUBE(channels.channel_desc, countries.country_iso_code);

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 acrosscalendar_month_desc and country_id for each channel_desc value.
- It does not produce a grand total row.

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

       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.

```
SQL> SELECT channel_desc, calendar_month_desc, countries.country_iso_code,
  2         TO_CHAR(SUM(amount_sold), '9,999,999,999') SALES$
3  FROM sales, customers, times, channels, countries
4  WHEREsales.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', '2000-10')
 10    AND countries.country_iso_code IN ('GB', 'US')
11  GROUP BY channel_desc, CUBE(calendar_month_desc, countries.country_iso_code);

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

```
SQL> SELECT channel_desc, calendar_month_desc, country_iso_code,
2  TO_CHAR(SUM(amount_sold), '9,999,999,999') SALES$, GROUPING(channel_desc) AS Ch,
  3     GROUPING(calendar_month_desc) AS Mo, GROUPING(country_iso_code) AS Co
4  FROM sales, customers, times, channels, countries
5  WHEREsales.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 ROLLUP(channel_desc, calendar_month_desc, countries.country_iso_code);

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)

```
SQL>  SELECTchannels.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  WHEREsales.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  ANDchannels.channel_desc IN ('Direct Sales', 'Internet')
10  ANDtimes.calendar_month_desc IN ('2000-09', '2000-10')
11  ANDcountries.country_iso_code IN ('GB', 'US')
12  GROUP BY
 13   GROUPING SETS((channels.channel_desc, calendar_month_desc, countries.country_iso_code),
 14    (channels.channel_desc, countries.country_iso_code),
 15    (calendar_month_desc, countries.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.
```

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_QUARTER_DESC,CALENDAR_MONTH_DESC,CALENDAR_YEAR,
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_YEAR='1999'
10  AND COUNTRIES.COUNTRY_ISO_CODE IN('GB','US')
11  GROUP BY
12  ROLLUP(TIMES.CALENDAR_YEAR,CALENDAR_QUARTER_DESC,CALENDAR_MONTH_DESC);

CALENDA CALENDAR CALENDAR_YEAR SALES$
------- -------- ------------- --------------
1999-01 1999-01           1999        974,628
1999-01 1999-02           1999      1,089,256
1999-01 1999-03           1999        754,027
1999-01                   1999      2,817,911
1999-02 1999-04           1999        708,061
1999-02 1999-05           1999        818,056
1999-02 1999-06           1999        729,678
1999-02                   1999      2,255,794
1999-03 1999-07           1999        893,452
1999-03 1999-08           1999        883,461
1999-03 1999-09           1999        923,577

CALENDA CALENDAR CALENDAR_YEAR SALES$
------- -------- ------------- --------------
1999-03                   1999      2,700,490
1999-04 1999-10           1999        715,831
1999-04 1999-11           1999        742,248
1999-04 1999-12           1999        841,572
1999-04                   1999      2,299,652
                          1999     10,073,847
                                   10,073,847

18 rows selected.
```

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

```
SQL> SELECT CHANNELS.CHANNEL_TOTAL,CHANNEL_CLASS,
2  COUNTRIES.COUNTRY_ISO_CODE,COUNTRY_REGION,
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  ROLLUP(CHANNELS.CHANNEL_TOTAL,CHANNEL_CLASS),
14  ROLLUP(COUNTRIES.COUNTRY_REGION,COUNTRY_ISO_CODE);

CHANNEL_TOTAL CHANNEL_CLASS        CO COUNTRY_REGION       SALES$
------------- -------------------- -- -------------------- --------------
                                   GB Europe                     208,257
                                      Europe                     208,257
                                   US Americas                 1,581,775
                                      Americas                 1,581,775
                                                               1,790,032
```

```
Channel total                     GB Europe                     208,257
Channel total                        Europe                     208,257
Channel total                     US Americas                 1,581,775
Channel total                        Americas                 1,581,775
Channel total                                                 1,790,032
Channel total Direct              GB Europe                     177,148

CHANNEL_TOTAL CHANNEL_CLASS        CO COUNTRY_REGION       SALES$
------------- -------------------- -- -------------------- -------------
Channel total Direct                 Europe                     177,148
Channel total Direct              US Americas                 1,320,497
Channel total Direct                 Americas                 1,320,497
Channel total Direct                                          1,497,646
Channel total Indirect            GB Europe                      31,109
Channel total Indirect               Europe                      31,109
Channel total Indirect            US Americas                   261,278
Channel total Indirect               Americas                   261,278
Channel total Indirect                                          292,387

20 rows selected.
```

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)
```

```
SQL> SELECT deptno, job, SUM(sal)
2  FROMemp
3  GROUP BY CUBE(deptno, job)
4  ;

    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.

```
SQL> SELECT CHANNELS.CHANNEL_DESC,TIMES.CALENDAR_MONTH_DESC,
2  COUNTRIES.COUNTRY_NAME,
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 COUNTRIES.COUNTRY_NAME LIKE 'U%'
10  AND CHANNELS.CHANNEL_DESC IN ('Direct Sales','Internet')
11  AND TIMES.CALENDAR_MONTH_DESC  IN('2000-09','2000-10')
12  AND COUNTRIES.COUNTRY_ISO_CODE IN('GB','US')
13  GROUP BY
14  ROLLUP(TIMES.CALENDAR_MONTH_DESC,CHANNELS.CHANNEL_DESC,COUNTRIES.COUNTRY_NAME);

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$
--------------
Direct Sales         2000-09  United Kingdom
        85,223

Direct Sales         2000-09  United States of America
       638,201

Direct Sales         2000-09
       723,424


CHANNEL_DESC         CALENDAR COUNTRY_NAME
-------------------- -------- ----------------------------------------
SALES$
--------------
                     2000-09
       864,217

Internet             2000-10  United Kingdom
        14,539

Internet             2000-10  United States of America
       137,054


CHANNEL_DESC         CALENDAR COUNTRY_NAME
-------------------- -------- ----------------------------------------
SALES$
--------------
Internet             2000-10
       151,593

Direct Sales         2000-10  United Kingdom
        91,925

Direct Sales         2000-10  United States of America
       682,297


CHANNEL_DESC         CALENDAR COUNTRY_NAME
-------------------- -------- ----------------------------------------
SALES$
--------------
Direct Sales         2000-10
```

```
       774,222

                    2000-10
       925,815


     1,790,032


15 rows selected.
```

```
Q12. Analyze the output
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_idch.channel_id AND ch.channel_desc IN ('Direct Sales', 'Internet')
    ANDt.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);
```

```
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.
```