PRACTICAL 2

Aim: Write and Execute SQL aggregation queries for data warehouse.

Details: To run queries for CUBE, PARTIAL CUBE, ROLLUP, PARTIAL ROLLUP,

GROUPING, GROUPING SETS, GROUP_ID( ).

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.

```
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_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
                                    1,790,032
```

15 rows selected.

---

2. 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.

```
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);
```

```
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

```
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')

AND countries.country_iso_code IN ('FR', 'US')

GROUP BY

ROLLUP(channels.channel_desc, calendar_month_desc,
```

countries.country_iso_code);

CHANNEL_DESC CALENDAR CO SALES$

---------- -------- -- ----------

Internet 2000-09 FR 9,597

Internet 2000-09 US 124,224

Internet 2000-09 133,821

Internet 133,821

Direct Sales 2000-09 FR 61,202

Direct Sales 2000-09 US 638,201

Direct Sales 2000-09 699,403

Direct Sales 699,403

833,224

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 2000 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.

```
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_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 2000 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
channels.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 CO

```
SELECT channels.channel_desc, calendar_month_desc,
countries.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(channels.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 2000 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.

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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.

```
SELECT calendar_month_desc,calendar_quarter_desc,calendar_year,
SUM(amount_sold)
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 IN ('1999')
AND countries.country_iso_code IN ('GB', 'US')
GROUP BY rollup (calendar_year,calendar_quarter_desc,calendar_month_desc);
```

```
CALENDAR CALENDA CALENDAR_YEAR SUM(AMOUNT_SOLD)
-------- ------- ------------- ----------------
1999-01  1999-01         1999       974627.95
1999-02  1999-01         1999      1089255.92
1999-03  1999-01         1999       754026.7
         1999-01         1999      2817910.57
```

1999-04 1999-02 1999 708060.57

1999-05 1999-02 1999 818055.52

1999-06 1999-02 1999 729677.52

1999-02 1999 2255793.61

1999-07 1999-03 1999 893452.47

1999-08 1999-03 1999 883460.92

1999-09 1999-03 1999 923577.01

CALENDAR CALENDA CALENDAR_YEAR SUM(AMOUNT_SOLD)

-------- ------- ------------- ----------------

1999-03 1999 2700490.4

1999-10 1999-04 1999 715831.36

1999-11 1999-04 1999 742248.42

1999-12 1999-04 1999 841572.17

1999-04 1999 2299651.95

1999 10073846.5

10073846.5

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)

SELECT channel_class,channel_total,country_region,country_iso_code,

```
SUM(amount_sold)
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 ('2000-09', '2000-10')
AND countries.country_iso_code IN ('GB', 'US')
AND channels.channel_desc IN ('Direct Sales', 'Internet')
GROUP BY rollup (channel_total,channel_class) ,rollup(country_region,country_iso_code);
```

CHANNEL_CLASS	CHANNEL_TOTAL	COUNTRY_REGION	CO	SUM(AMOUNT_SOLD)
		Europe	GB	208256.85
		Europe		208256.85
		Americas	US	1581775.44
		Americas		1581775.44
				1790032.29
	Channel total	Europe	GB	208256.85
	Channel total	Europe		208256.85
	Channel total	Americas	US	1581775.44
	Channel total	Americas		1581775.44
	Channel total			1790032.29
Direct	Channel total	Europe	GB	177148.35

CHANNEL_CLASS CHANNEL_TOTAL COUNTRY_REGION CO SUM(AMOUNT_SOLD)

---------- ---------- ---------- -- ----------

Direct Channel total Europe 177148.35

Direct Channel total Americas US 1320497.4

Direct Channel total Americas 1320497.4

Direct Channel total 1497645.75

Indirect Channel total Europe GB 31108.5

Indirect Channel total Europe 31108.5

Indirect Channel total Americas US 261278.04

Indirect Channel total Americas 261278.04

Indirect Channel total 292386.54

20 rows selected.

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

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.

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.

```
SELECT channels.channel_desc,countries.country_name,
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 UPPER(countries.country_name) LIKE 'U%'
GROUP BY
ROLLUP(channels.channel_desc,countries.country_name);
```

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

7 rows selected.
```

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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_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')
```

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```
co.country_name
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.

// 7 is binary of 111 it tells for how many dimensions used.
