LAB EXPERIMENT NO. 07

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BATCH:A1 BRANCH: COMPUTER

Aim: To perform various OLAP operations such as slice, dice, drilldown, rollup, pivot

AIM: Perform OLAP operations such as Roll up, Drill down, Slice and Dice, Pivot on Datawarehouse.

Theory:

OLAP is an acronym for On Line Analytical Processing**.** Online Analytical Processing: An OLAP system manages large amount of historical data, provides Facilities for summarization and aggregation, and stores and manages information at different levels of granularity.

OLAP operations:

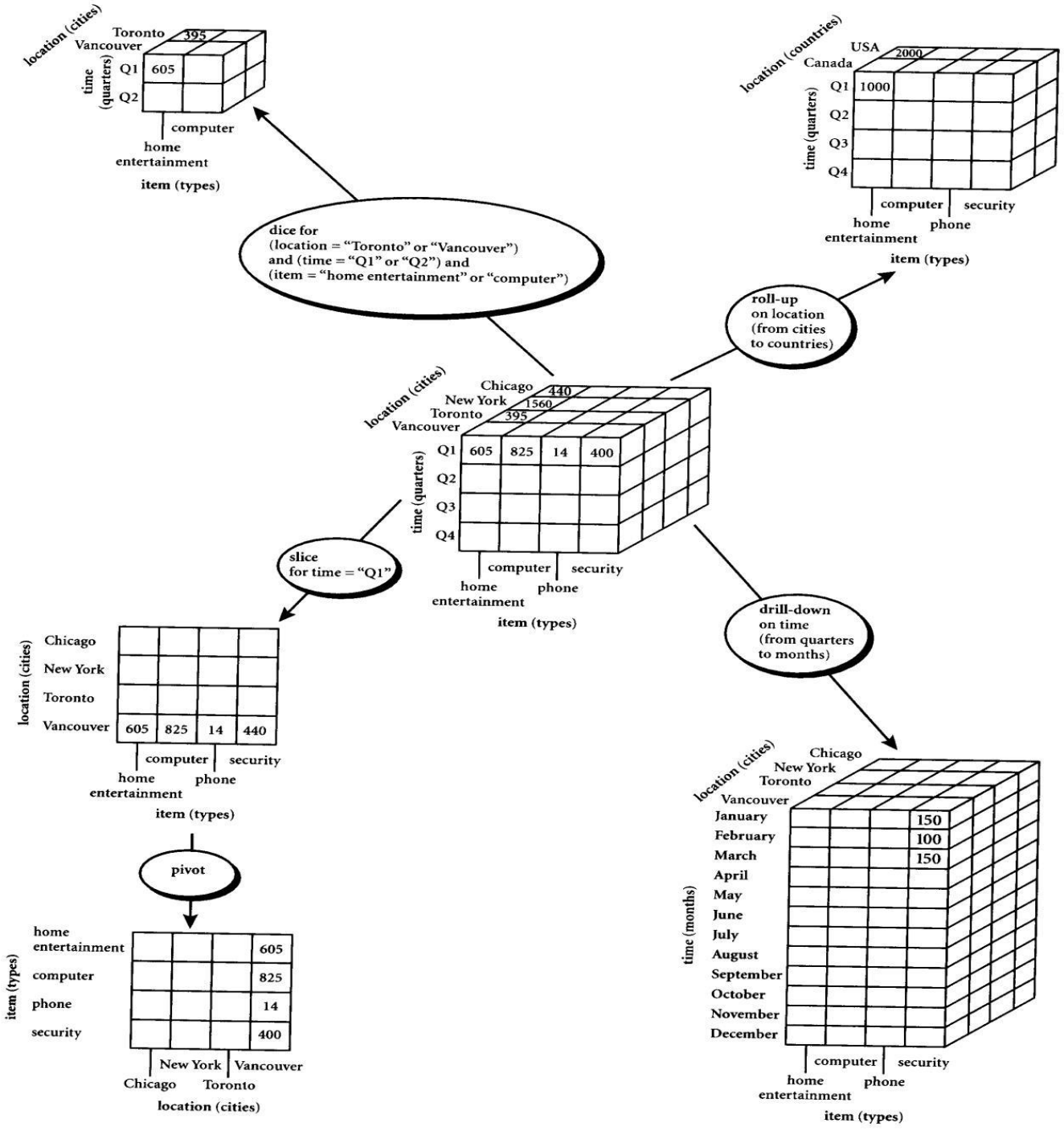
Slice: A slice is a subset of a multi-dimensional array corresponding to a single value for one or more members of the dimensions not in the subset.

Dice: The dice operation is a slice on more than two dimensions of a data cube (or more than two consecutive slices).

Drill Down/Up: Drilling down or up is a specific analytical technique whereby the user navigates among levels of data ranging from the most summarized (up) to the most detailed (down).

Roll-up: A roll-up involves computing all of the data relationships for one or more dimensions. To do this, a computational relationship or formula might be defined.

Pivot: To change the dimensional orientation of a report or page display.


location (cities)
Toronto
Vancouver
395
time (quarters)
Q1
605
Q2
computer
home entertainment
item (types)
dice for
(location = "Toronto" or "Vancouver")
and (time = "Q1" or "Q2") and
(item = "home entertainment" or "computer")
location (countries)
USA
2000
Canada
Q1
1000
Q2
Q3
Q4
time (quarters)
computer
security
home entertainment
phone
item (types)
roll-up
on location
(from cities
to countries)
location (cities)
Chicago
440
New York
1560
Toronto
395
Vancouver
Q1
605
825
14
400
Q2
Q3
Q4
time (quarters)
computer
security
home entertainment
phone
item (types)
slice
for time = "Q1"
drill-down
on time
(from quarters
to months)
location (cities)
Chicago
New York
Toronto
Vancouver
605
825
14
440
computer
security
home entertainment
phone
item (types)
pivot
item (types)
home entertainment
computer
phone
security
605
825
14
400
New York
Vancouver
Chicago
Toronto
location (cities)
location (cities)
Chicago
New York
Toronto
Vancouver
January
150
February
100
March
150
April
May
June
July
August
September
October
November
December
time (months)
computer
security
home entertainment
phone
item (types)

EXERCISE 1

Consider a data Warehouse for a hospital, where there are three dimensions:

(i) Doctor

(ii) Patient

(iii) Time

With two measures

(a) Count

(b) Charge

Where Charge is the fee that the Doctor charges a patient for a visit.

Using the above example describe the following operations:

(i) Slice

(ii) Dice

(iii) Roll Up

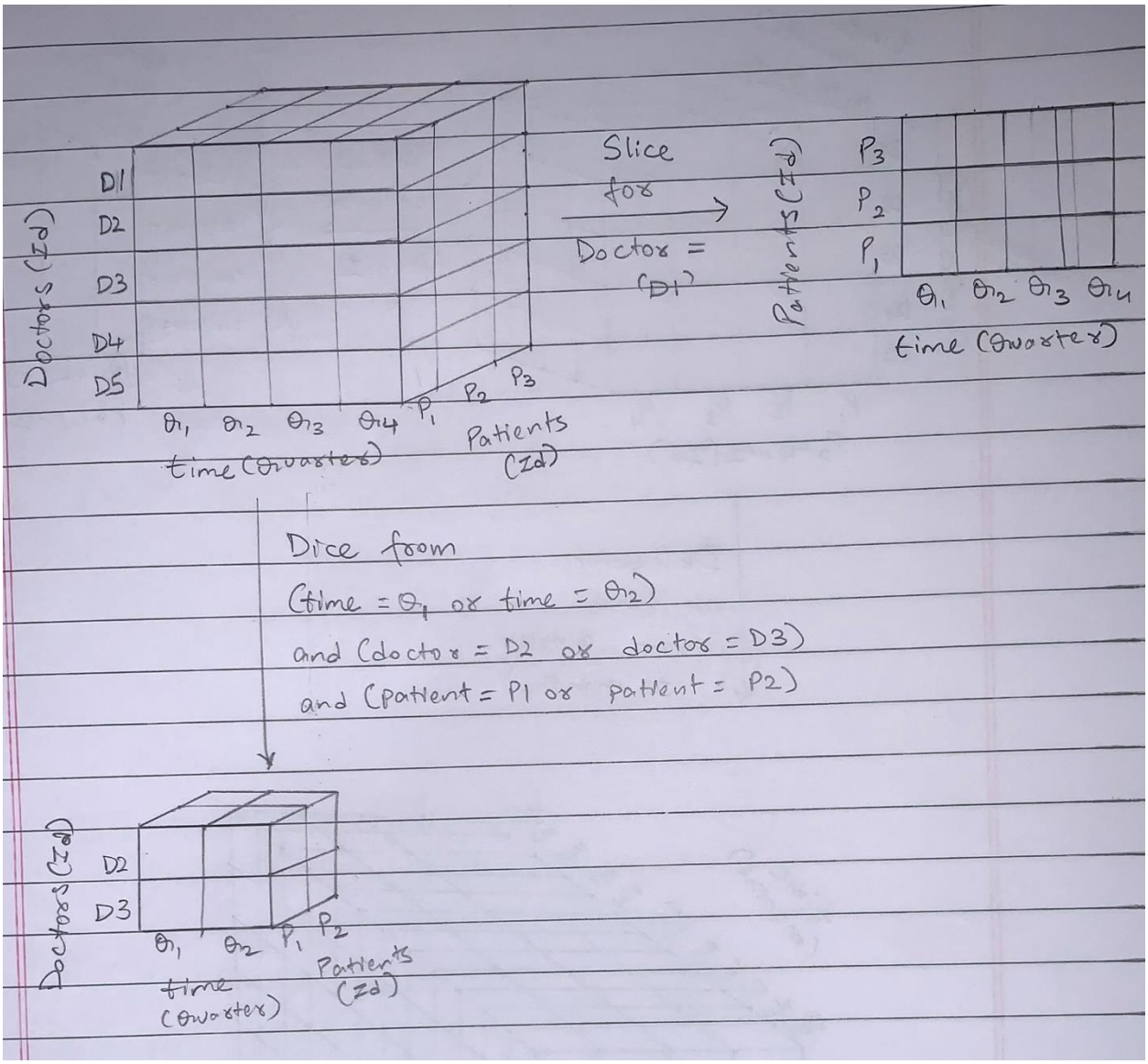
(iv) Drill Down

(v) Pivot

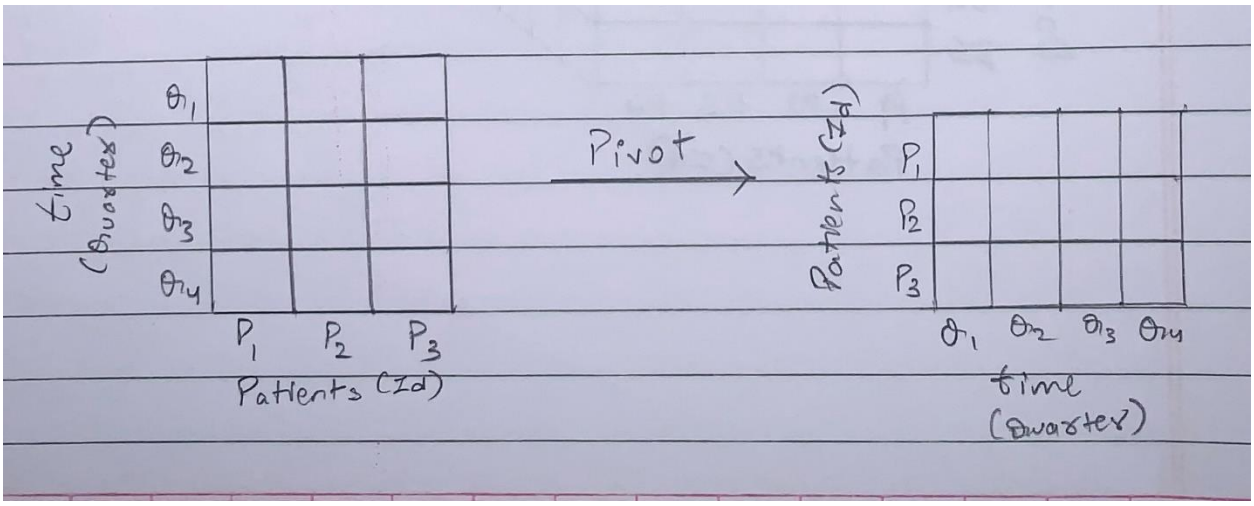
NOTE: Assume data according to the dimensions and measures and explore individual tasks diagrammatically.

Slice: It is a subset of the cubes corresponding to a single value for one or more members of the dimension. So, the operations perform a selection on one dimension of the given cube, thus resulting in a sub cube. For example, if we make the selection, doctor=D1 we will obtain the following cube in figure 1.1.

Dice: The dice operation describes a sub cube by operating a selection on two or more dimensions. For example, Implement the selection (time = “Q1” or time=”Q2”) and (doctor=”D1” or “D2”) and (patient=”P1” or “P2”) to the original cubes we get the following sub cube figure 1.1.

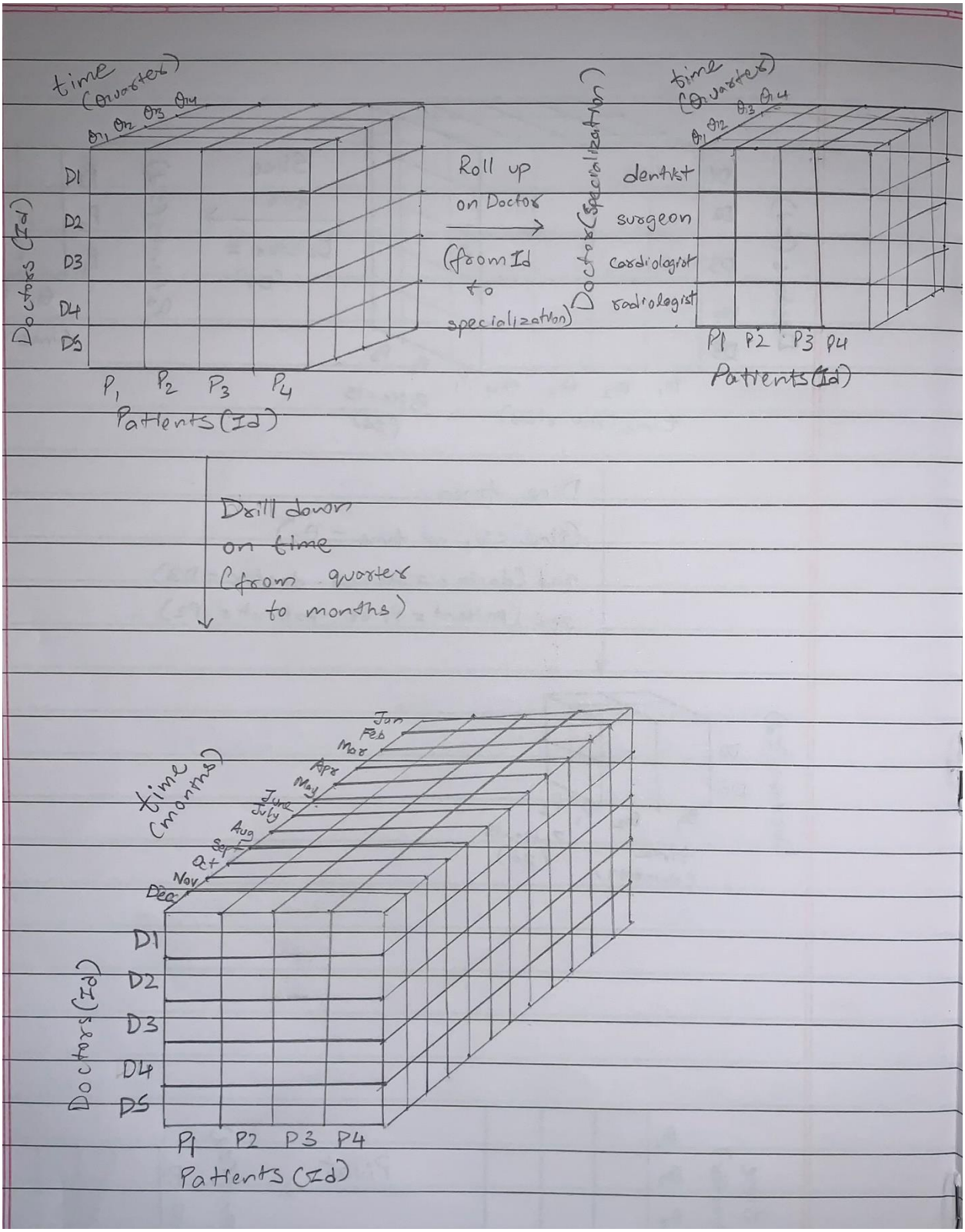


Pivot: It is also known as rotation operation as it rotates the current view to get a new view of the representation. In the sub-cube obtained after the slice operation, performing pivot operation gives a new view of it. For eg:



Roll Up: It is just the opposite of the drill-down operation. It performs aggregation on the cube. It can be done by climbing up in the concept hierarchy/reducing the dimensions. For eg: Implement roll-up operation on the cube by climbing up the concept hierarchy (Doctor id → specialization).

Drill Down: In this, the less detailed data is converted into highly detailed data. It can be done by moving down in the concept hierarchy/adding a new dimension. For eg: Implement drill down operation by moving down in the concept hierarchy of Time dimension (Quarter -> Month).


time (quarter)
Q1 Q2 Q3 Q4
D1
D2
D3
D4
D5
Doctors (Id)
P1 P2 P3 P4
Patients (Id)
Roll up on Doctor (from Id to specialization)
Doctors (specialization)
dentist
surgeon
cardiologist
radiologist
Drill down on time (from quarter to months)
time (months)
Jan
Feb
Mar
Apr
May
June
July
Aug
Sept
Oct
Nov
Dec

EXERCISE 2

To create Pivot of Table using MS Excel

Follow these steps …

1. Start with M.S Excel.
2. In excel sheet create 4 columns PRODUCT, ORIGIN, DAY OF SALE, SOLD UNITS (FACT COLUMN).
3. Insert around fifty rows of data.
4. Save the table data.
5. Go to Insert Tab-> click on Pivot Table-> New work sheet-> Ok.
6. Right side you will find pivot table fields.
   It contains all columns of our table that we created.
   Select product in rows,
   Days in column,
   Unit sold in ∑ values.
   Later apply filter using Origin.
   Also we can flip the rows & columns or combine together as rows only to see different views of same data.

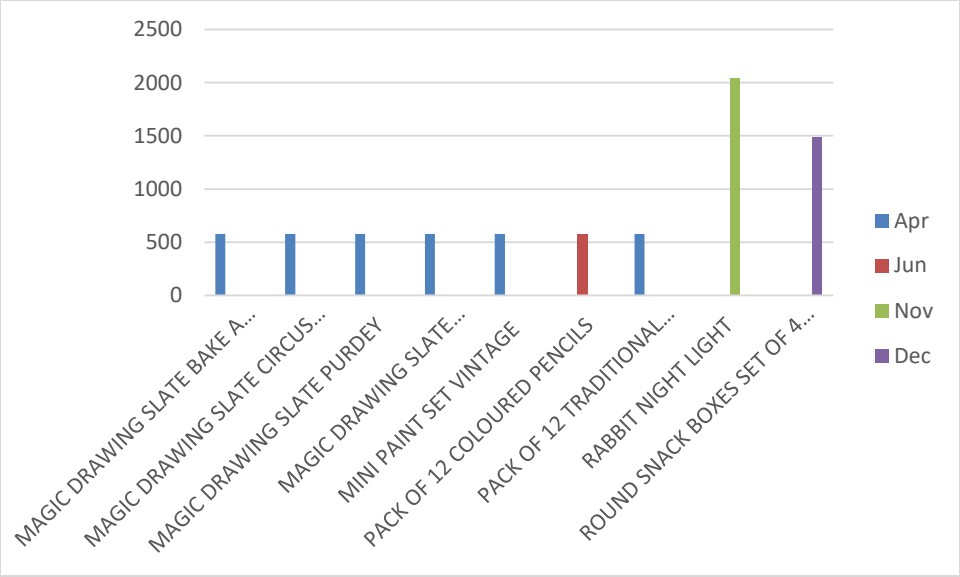
Data:

	PRODUCT	ORIGIN	DAY OF SALE	SOLD UNITS
2	ESSENTIAL BALM 3.5g TIN IN ENVELOPE	United Kingdom	16-02-2011 12:10	2400
3	GROW A FLYTRAP OR SUNFLOWER IN TIN	United Kingdom	16-12-2010 10:35	2400
4	GROW A FLYTRAP OR SUNFLOWER IN TIN	United Kingdom	11-02-2011 11:22	2400
5	RABBIT NIGHT LIGHT	Netherlands	27-10-2011 12:11	2400
6	PACK OF 12 SKULL TISSUES	United Kingdom	20-03-2011 10:37	2160
7	RED HARMONICA IN BOX	United Kingdom	03-11-2011 15:47	2100
8	RABBIT NIGHT LIGHT	Japan	29-11-2011 15:52	2040
9	GINGHAM HEART DECORATION	Netherlands	20-10-2011 12:26	1728
10	WORLD WAR 2 GLIDERS ASSTD DESIGNS	United Kingdom	13-04-2011 10:14	1728
11	LETTER SHAPE PENCIL SHARPENER	United Kingdom	09-06-2011 19:33	1600
12	Manual	United Kingdom	22-11-2011 15:22	1600
13	RED HARMONICA IN BOX	United Kingdom	04-10-2011 13:30	1540
14	HERB MARKER BASIL	United Kingdom	12-06-2011 13:17	1515
15	POPCORN HOLDER	United Kingdom	08-12-2011 18:45	1500
16	SMALL CHINESE STYLE SCISSOR	United Kingdom	15-02-2011 10:17	1500
17	VINTAGE DOILY JUMBO BAG RED	United Kingdom	02-12-2011 16:32	1500
18	ROUND SNACK BOXES SET OF 4 FRUITS	Japan	09-12-2010 10:44	1488
19	72 SWEETHEART FAIRY CAKE CASES	United Kingdom	07-07-2011 12:04	1440
20	ASSORTED INCENSE PACK	EIRE	03-12-2010 11:48	1440
21	RABBIT NIGHT LIGHT	France	28-10-2011 07:39	912
22	BLACK WINE GLASS	United Kingdom	24-05-2011 09:26	906
23	JUMBO BAG STRAWBERRY	United Kingdom	17-03-2011 10:17	900
24	LOVE HEART POCKET WARMER	United Kingdom	31-01-2011 12:33	900
25	POPART WOODEN PENCILS ASST	United Kingdom	24-07-2011 12:46	900
26	BLACK AND WHITE CAT BOWL	United Kingdom	24-05-2011 10:24	888
27	ILLUSTRATED CAT BOWL	United Kingdom	24-05-2011 10:24	888

Pivot Table for Origin = Netherlands:

1	ORIGIN	Netherlands		
2				
3	**Sum of SOLD UNITS**	**Column Labels**		
4	**Row Labels**	**Oct**	**Nov**	**Grand Total**
5	GINGHAM HEART DECORATION	1728		1728
6	MINI PAINT SET VINTAGE	576	1152	1728
7	RABBIT NIGHT LIGHT	2400		2400
8	**Grand Total**	**4704**	**1152**	**5856**

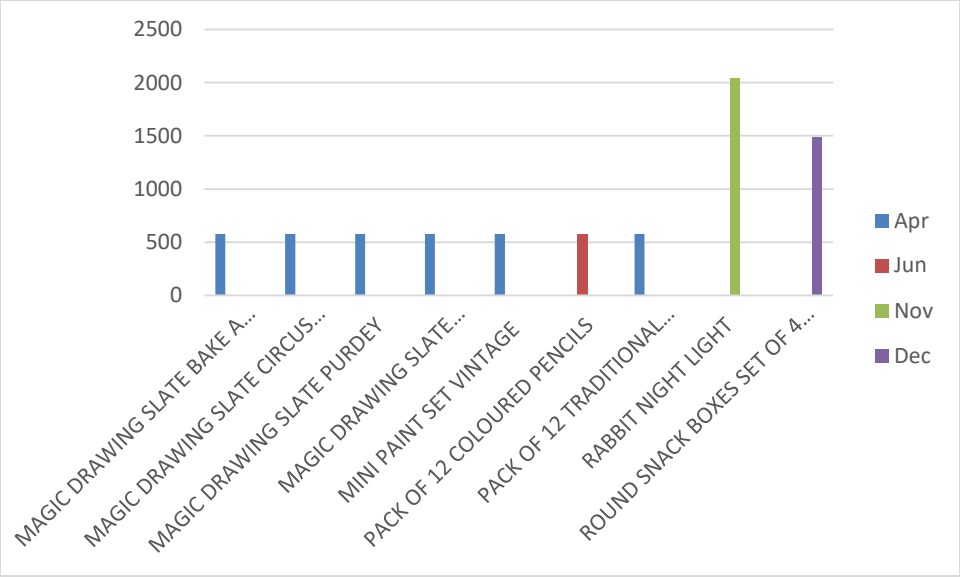
Pivot Chart for Origin = Netherlands:



Pivot Table for Origin = Japan:

1	ORIGIN	Japan				
2						
3	**Sum of SOLD UNITS**	**Column Labels**				
4	**Row Labels**	**Apr**	**Jun**	**Nov**	**Dec**	**Grand Total**
5	MAGIC DRAWING SLATE BAKE A CAKE	576				576
6	MAGIC DRAWING SLATE CIRCUS PARADE	576				576
7	MAGIC DRAWING SLATE PURDEY	576				576
8	MAGIC DRAWING SLATE SPACEBOY	576				576
9	MINI PAINT SET VINTAGE	576				576
10	PACK OF 12 COLOURED PENCILS		576			576
11	PACK OF 12 TRADITIONAL CRAYONS	576				576
12	RABBIT NIGHT LIGHT			2040		2040
13	ROUND SNACK BOXES SET OF 4 FRUITS				1488	1488
14	**Grand Total**	**3456**	**576**	**2040**	**1488**	**7560**

Pivot Chart for Origin = Japan:



Conclusion: Therefore, we have successfully performed OLAP operations such as Slice, Dice, Drill down, Roll up, Pivot on the Datawarehouse. An OLAP system manages large amount of historical data, provides Facilities for summarization and aggregation, and stores and manages information at different levels of granularity.