

Tutorial 11: An Introduction to SQL Server Analysis Services and Data Warehousing

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1 Deliverable 1

User would like to use **drill down** to see the contribution to the total sales for a specific kind of product, or a specific category of products. An example question that drill down can answer is “In my total sales, how much does Washington Apple Juice contribute to the sales?”

User would like to use **roll up** to see the summarized statistics, such as total sales and total expenses. An example question that roll up can answer is “Given the salary of each employee, how much does the company pay in total for all the salaries?”

2 Deliverable 2

Drill down on the drink products and find *Washington Apple Juice*

1. The grand total of all daily unit sales is **1554**.
2. (a) **Monday** has the highest number of sales for that product (265).
(b) The sales are not evenly distributed. Monday 265, Tuesday 197, Wednesday 244, Thursday 184, Friday 214, Saturday: 221, Sunday: 229. So Friday, Saturday, and Sunday’s sales are roughly 220, Monday and Wednesday have more than 240, but Tuesday and Thursday have below 200 sales.
3. A business want to track the total number of unit sales on a particular day to determine how many sales they made on that day. For example, if the business has a promotion event on that particular day, the business would like to measure how effective the promotion is.
4. A business want to identify outliers because they don’t want to make business decisions imprecisely on these outliers. For example, Washington Apple Juice is very unpopular in a retail shop. One day, a rich man who happen to travel to the city and goes into the shop and buys all the Washington Apple Juice, this data should be excluded because the Washington Apple Juice is unpopular for the shop’s daily customers.

3 Deliverable 3

- the Data Cube in specified in the “FROM” clause in MDX.
- the drill down dimensions and filter expressions are specified in the “ON COLUMNS” list in MDX.
- the data we would like to see for particular filters is selected in the “ON ROWS” list in MDX.

The MDX query results are a drill-down of the total unit sales in the Data Cube from Step 4. It drills down the total unit sales to three categories — drink, food, and non-consumable.

4 Deliverable 4

My user id is: f4a0b

ect Explorer

connect

FoodMart 2008_a1k0b

FoodMart 2008_a1x0b

FoodMart 2008_a4d5

FoodMart 2008_a8l0b

FoodMart 2008_b2q0b

FoodMart 2008_b3l0b

FoodMart 2008_b4n0b

FoodMart 2008_b4u9a

FoodMart 2008_b9h0b

FoodMart 2008_c2a1b

FoodMart 2008_c3k0b

FoodMart 2008_c4n0b

FoodMart 2008_c5m0b

FoodMart 2008_c6f0b

FoodMart 2008_cs304

FoodMart 2008_cs304_test

FoodMart 2008_d3l6

FoodMart 2008_e0a0b

FoodMart 2008_e3n6

FoodMart 2008_e5e0b

FoodMart 2008_e9r0b

FoodMart 2008_e9u0b

FoodMart 2008_f4a0b

Data Sources

Data Source Views

Cubes

Dimensions

Mining Structures

Roles

Assemblies

MDXQuery1.mdx - ...0b (CS-USE\F4a0b)*

Cube: Budget

Metadata Functions

Search Model

Measure Group: <All>

Budget

Measures

KPIs

Account

Category

Currency

Customer

Product

Promotion

Store

Time

Warehouse

SELECT { Drink, Food, [Non-Consumable] } ON COLUMNS,
{ Measures.[Unit Sales], Measures.[Store Cost] } ON ROWS
FROM [Warehouse and Sales]

100 %

Messages

Results

	Drink	Food	Non-Consumable
Unit Sales	71551	557863	147346
Store Cost	56975.9036000001	475264.365400003	125952.6935

5 Deliverable 5

a) Query Unit Sales and Store Cost of "Drink".

Sales and Employees

Metadata

Measure Group: <All>

Sales and Employees

Measures

Sales

Sales Count

Store Cost

Store Sales

Unit Sales

Profit

KPIs

Dimension	Hierarchy	Operator	Filter Expression
Product	Products	Equal	{ Drink }
<Select dimension>			

Unit Sales	Store Cost
71551	56975.9036000001

b) Query Unit Sales and Store Cost of "Food".

Edit as Text Import...			
Sales and Employees	Dimension	Hierarchy	Operator
Metadata	Product	Products	Equal
Measure Group:	Filter Expression		
<All>	<Select dimension>		
Sales and Employees			
Measures			
Sales			
Sales Count			
Store Cost			
Store Sales			
Unit Sales			
Profit			
KPIs			
Currency			
Customer			

Unit Sales	Store Cost
557863	475264.3654

c) Query Unit Sales and Store Cost of "Non-Consumable".

Edit as Text Import...			
Sales and Employees	Dimension	Hierarchy	Operator
Metadata	Product	Products	Equal
Measure Group:	Filter Expression		
<All>	<Select dimension>		
Sales and Employees			
Measures			
Sales			
Sales Count			
Store Cost			
Store Sales			
Unit Sales			
Profit			
KPIs			
Currency			
Customer			

Unit Sales	Store Cost
147346	125952.6935

6 Deliverable 6

Choose (a) – creating and running an MDX query

```
SELECT { [Bachelor Degree], [Graduate Degree], [High School Degree] } ON COLUMNS,
       { Measures.[Employee Count], Measures.[Overtime Count] } ON ROWS
FROM   [HR]
```

Object Explorer: Connect to FoodMart 2008_c2a1b, FoodMart 2008_c3k0b, FoodMart 2008_c4n0b, FoodMart 2008_c5m0b, FoodMart 2008_c6f0b, FoodMart 2008_cs304, FoodMart 2008_cs304_test, FoodMart 2008_d3l6, FoodMart 2008_e0a0b, FoodMart 2008_e3n6, FoodMart 2008_e5e0b, FoodMart 2008_e9r0b, FoodMart 2008_e9u0b, FoodMart 2008_f4a0b, Data Sources, Data Source Views, Cubes, Budget, HR, Measure Groups, Employee, Salary, Sales and Employees, Measure Groups, Warehouse and Sales, Dimensions, Mining Structures, Roles, Assemblies.

MDXQuery1.mdx -...0b (CS-USE\F4a0b)*

Cube: Budget

Metadata / Functions

Search Model

Measure Group: <All>

Budget

- Measures
 - Expense
 - Amount
 - Expense Fact Count
 - Sales
 - Sales Count
 - Store Cost
 - Store Sales
 - Unit Sales
- KPIs
 - Account
 - Category
 - Currency
 - Customer
 - Product
 - Promotion
 - Store
 - Time
 - Warehouse

100 %

Messages Results

	Bachelors Degree	Graduate Degree	High School Degree
Employee Count	287	170	281
Overtime Hours	71325	45310	70544

Explanation:

This query result answers the question “How does education level of employees affect their overtime hours”. We can see that 287 Bachelor employees work 71325 overtime hours – on average 249 hours/employee; 170 Graduate employees work 45310 overtime hours – on average 267 hours/employee; 281 High School employees work 70544 overtime hours – on average 251 hours/employee. So employees with Graduate degrees tend to work overtime more often.

7 Deliverable 7

I drilled down on the sales of soda drinks categorized by different brands and different quarters of year 1997.

Column Labels										1997 Store Cost	1997 Unit Sales
1997											
Q1											
Q2											
Q3											
Q4											
Row Labels	Store Cost	Sales	Store Cost	Unit Sales	Store Cost	Unit Sales	Store Cost	Unit Sales	Store Cost	Unit Sales	
Drink	4621.5034	5976	4728.4702	5895	4790.6555	6065	5336.6055	6661	19477.2346	24597	
Alcoholic Beverages	1223.8054	1567	1389.208	1699	1363.9471	1696	1599.8247	1876	5576.7852	6838	
Beverages	2701.4871	3333	2694.5243	3267	2753.9212	3376	2919.5976	3597	11069.5302	13573	
Carbonated Beverages	580.8618	789	642.2198	856	637.0986	882	624.4247	880	2484.6049	3407	
Soda	580.8618	789	642.2198	856	637.0986	882	624.4247	880	2484.6049	3407	
Excellent	128.0635	174	133.3952	192	141.737	211	106.8414	161	510.0371	738	
Fabulous	111.5542	131	142.3873	168	121.9582	155	134.3854	178	510.2851	632	
Skinner	107.4942	161	124.2646	167	136.5695	153	132.5334	174	500.8617	655	
Token	91.9347	180	70.3428	152	84.2495	195	101.4649	208	347.9919	735	
Washington	141.8152	143	171.8299	177	152.5844	168	149.1996	159	615.4291	647	
Drinks	538.2722	617	524.6467	569	525.0815	562	659.1089	721	2247.1093	2469	
Hot Beverages	927.6067	1090	907.3009	1037	899.8629	1037	973.3142	1137	3708.0847	4301	
Pure Juice Beverages	654.7464	837	620.3569	805	691.8782	895	662.7498	859	2629.7313	3396	
Dairy	696.2109	1076	644.7379	929	672.7872	993	817.1832	1188	2830.9192	4186	
Food	40446.8486	47809	38112.6264	44825	40545.0527	47440	44166.1958	51866	163270.7235	191940	
Non-Consumable	10683.8885	12506	10123.1282	11890	10569.1612	12343	11503.0976	13497	42879.2755	50236	
Grand Total	55752.2405	66291	52964.2248	62610	55904.8694	65848	61005.8989	72024	225627.2336	266773	