

Department of Software Engineering
Mehran University of Engineering and Technology, Jamshoro

Course: SWE324 - Data Warehousing and Data Mining

Instructor	Rabeea Jaffari	Practical/Lab No.	06,07,08
Date	07 May 2019	CLOs	CLO-4: P3 & P4
Signature		Assessment Score	1 Marks

Topic	To become familiar with DW implementation, query execution and result analysis
Objectives	<ul style="list-style-type: none"> - To learn physical DW Design - To learn executing queries in DW - To learn analyzing results of DW queries

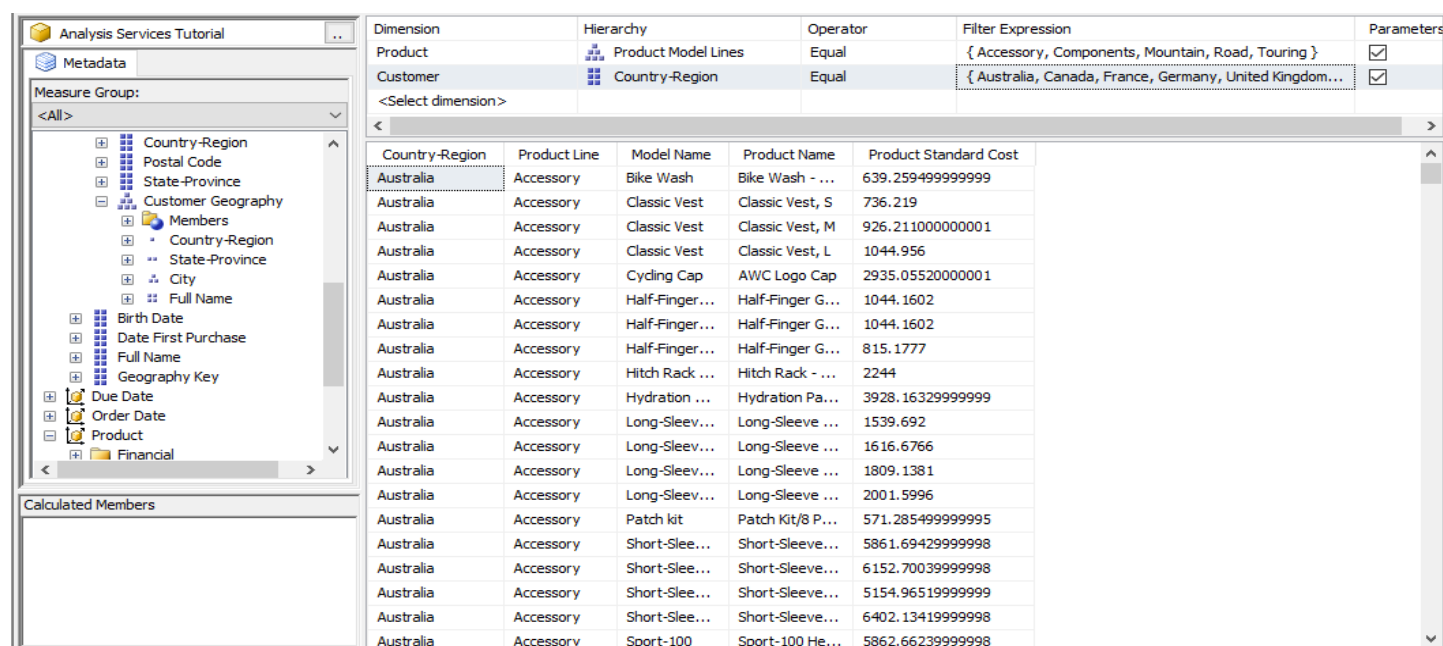
Lab Discussion: Theoretical concepts and Procedural steps

Lab Tasks
Submission Date:

Generate reports using both MDX and Excel Pivot table for the following scenarios:

1. Display the standard cost of all the products along with their categories according to the regions in which they were sold. Which region is the most and the least expensive according to the result retrieved?

MDX:



Dimension	Hierarchy	Operator	Filter Expression	Parameters
Product	Product Model Lines	Equal	{ Accessory, Components, Mountain, Road, Touring }	<input checked="" type="checkbox"/>
Customer	Country-Region	Equal	{ Australia, Canada, France, Germany, United Kingdom...	<input checked="" type="checkbox"/>

Country-Region	Product Line	Model Name	Product Name	Product Standard Cost
Australia	Accessory	Bike Wash	Bike Wash - ...	639.259499999999
Australia	Accessory	Classic Vest	Classic Vest, S	736.219
Australia	Accessory	Classic Vest	Classic Vest, M	926.211000000001
Australia	Accessory	Classic Vest	Classic Vest, L	1044.956
Australia	Accessory	Cyding Cap	AWC Logo Cap	2935.055200000001
Australia	Accessory	Half-Finger...	Half-Finger G...	1044.1602
Australia	Accessory	Half-Finger...	Half-Finger G...	1044.1602
Australia	Accessory	Half-Finger...	Half-Finger G...	815.1777
Australia	Accessory	Hitch Rack ...	Hitch Rack - ...	2244
Australia	Accessory	Hydration ...	Hydration Pa...	3928.163299999999
Australia	Accessory	Long-Sleev...	Long-Sleeve ...	1539.692
Australia	Accessory	Long-Sleev...	Long-Sleeve ...	1616.6766
Australia	Accessory	Long-Sleev...	Long-Sleeve ...	1809.1381
Australia	Accessory	Long-Sleev...	Long-Sleeve ...	2001.5996
Australia	Accessory	Patch kit	Patch Kit/8 P...	571.285499999999
Australia	Accessory	Short-Slee...	Short-Sleeve...	5861.694299999998
Australia	Accessory	Short-Slee...	Short-Sleeve...	6152.700399999998
Australia	Accessory	Short-Slee...	Short-Sleeve...	5154.965199999999
Australia	Accessory	Short-Slee...	Short-Sleeve...	6402.134199999998
Australia	Accessory	Sport-100	Sport-100 He...	5862.662399999998

Analysis Services Tutorial

Metadata Functions

Measure Group:

<All>

- Country-Region
- Postal Code
- State-Province
- Customer Geography
 - Members
 - Country-Region
 - State-Province
 - City
 - Full Name
- Birth Date
- Date First Purchase
- Full Name
- Geography Key
- Due Date
- Order Date
- Product
 - Financial
 - History
 - Stocking
 - Model Name
 - Product Line
 - Product Name
 - Product Model Lines
 - Ship Date

```
SELECT NON EMPTY { [Measures].[Product Standard Cost] } ON COLUMNS, NON EMPTY { ([Customer].[Customer Geography].[Country-Region].ALLMEMBERS * [Product].[Product Model Lines].[Product Name].ALLMEMBERS ) } DIMENSION PROPERTIES MEMBER_CAPTION, MEMBER_UNIQUE_NAME ON ROWS FROM ( SELECT ( STRTOSET(@CustomerCountryRegion, CONSTRAINED) ) ON COLUMNS FROM ( SELECT ( STRTOSET(@ProductProductModelLines, CONSTRAINED) ) ON COLUMNS FROM [Analysis Services Tutorial] ) ) WHERE ( IIF( STRTOSET(@CustomerCountryRegion, CONSTRAINED).Count = 1, STRTOSET(@CustomerCountryRegion, CONSTRAINED), [Customer].[Country-Region].currentmember ) ) CELL PROPERTIES VALUE, BACK_COLOR, FORE_COLOR, FORMATTED_VALUE, FORMAT_STRING, FONT_NAME, FONT_SIZE, FONT_FLAGS
```

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Country-Region	Product Line	Model Name	Product Name	Product Standard Cost
Australia	Accessory	Long-Sleev...	Long-Sleeve ...	1616.6766
Australia	Accessory	Long-Sleev...	Long-Sleeve ...	1809.1381
Australia	Accessory	Long-Sleev...	Long-Sleeve ...	2001.5996
Australia	Accessory	Patch kit	Patch Kit/8 P...	571.285499999995
Australia	Accessory	Short-Slee...	Short-Sleeve...	5861.69429999998
Australia	Accessory	Short-Slee...	Short-Sleeve...	6152.70039999998
Australia	Accessory	Short-Slee...	Short-Sleeve...	5154.96519999999
Australia	Accessory	Short-Slee...	Short-Sleeve...	6402.13419999998
Australia	Accessory	Sport-100	Sport-100 He...	5862.66239999998
Australia	Accessory	Sport-100	Sport-100 He...	5391.55559999998
Australia	Accessory	Sport-100	Sport-100 He...	5561.67749999998
Australia	Accessory	Water Bottle	Water Bottle ...	1478.10959999999
Australia	Mountain	All-Purpose...	All-Purpose B...	3865.29
Australia	Mountain	Fender Set...	Fender Set - ...	2671.66249999998
Australia	Mountain	HL Mountai...	HL Mountain ...	3141.60000000001
Australia	Mountain	LL Mountai...	LL Mountain ...	1981.41559999999
Australia	Mountain	ML Mountai...	ML Mountain ...	2220.82740000001

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3	Product Standard Cost	Column Labels				
4	Row Labels	Accessory	Mountain	Road	Touring	Grand Total
5	Australia	\$64,761.25	\$1,582,704.84	\$3,108,482.54	\$619,196.88	\$5,375,145.51
6	Canada	\$40,468.50	\$357,452.76	\$580,711.94	\$169,290.16	\$1,147,923.36
7	France	\$27,657.95	\$497,307.11	\$817,651.80	\$215,136.14	\$1,557,752.99
8	Germany	\$27,319.44	\$554,815.98	\$859,371.09	\$265,435.06	\$1,706,941.57
9	United Kingdom	\$34,163.66	\$643,648.68	\$996,673.78	\$326,735.31	\$2,001,221.43
10	United States	\$107,830.73	\$1,914,816.94	\$2,659,111.63	\$807,049.42	\$5,488,808.71
11	Grand Total	\$302,201.53	\$5,550,746.30	\$9,022,002.78	\$2,402,842.96	\$17,277,793.58

Results:

Least expensive region: **Canada**

Most expensive region: **United States**

2. Display the Tax amount for customers according to their educations and occupations over calendar year. Do these factors impact the tax amount paid by a customer? Which class of customers pays the highest tax amount?

MDX:

Dimension	Hierarchy	Operator	Filter Expression	Parameters
Customer	Education	Equal	{ Bachelors, Graduate Degree, High School, Partial Coll...	<input checked="" type="checkbox"/>
Customer	Occupation	Equal	{ Clerical, Management, Manual, Professional, Skilled M...	<input checked="" type="checkbox"/>
<Select dimension>				
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Education	Occupation	Calendar Year	Tax Amount	
Bachelors	Clerical	2011	26292.7133	
Bachelors	Clerical	2012	29670.195...	
Bachelors	Clerical	2013	59855.973...	
Bachelors	Clerical	2014	43.3848	
Bachelors	Management	2010	572.5232	
Bachelors	Management	2011	41220.4452	
Bachelors	Management	2012	34821.3409	
Bachelors	Management	2013	127173.84	
Bachelors	Management	2014	401.8576	
Bachelors	Manual	2011	2231.0432	
Bachelors	Manual	2012	535.7066	
Bachelors	Manual	2013	2770.7031...	
Bachelors	Manual	2014	2.1824	
Bachelors	Professional	2010	1100.2592	
Bachelors	Professional	2011	76995.176...	
Bachelors	Professional	2012	68042.321...	
Bachelors	Professional	2013	174140.26...	
Bachelors	Professional	2014	289.2792	
Bachelors	Skilled Ma...	2010	55.9279	
Bachelors	Skilled Ma...	2011	28841.165	

Analysis Services Tutorial

Metadata

Functions

Measure Group:

<All>

State-Province

City

Full Name

Birth Date

Date First Purchase

Full Name

Geography Key

Due Date

Order Date

Order Date.Calendar Quarter

Order Date.Calendar Semester

Order Date.Calendar Year

Order Date.Date Key

Order Date.English Month Name

Order Date.Calendar Date

Product

Financial

History

Stocking

Model Name

Product Line

Product Name

Product Model Lines

Ship Date

```

SELECT NON EMPTY { [Measures].[Tax Amount] } ON COLUMNS, NON EMPTY { ([Customer].[Education].[Education].ALLMEMBERS * [Customer].[Occupation].[Occupation].ALLMEMBERS * [Order Date].[Calendar Year].[Calendar Year].ALLMEMBERS ) } DIMENSION PROPERTIES MEMBER_CAPTION, MEMBER_UNIQUE_NAME ON ROWS FROM ( SELECT ( STRTOSET (@CustomerOccupation, CONSTRAINED) ) ON COLUMNS FROM ( SELECT ( STRTOSET (@CustomerEducation, CONSTRAINED) ) ON COLUMNS FROM [Analysis Services Tutorial] ) ) CELL PROPERTIES VALUE, BACK_COLOR, FORE_COLOR, FORMATTED_VALUE, FORMAT_STRING, FONT_NAME, FONT_SIZE, FONT_FLAGS

```

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Education	Occupation	Calendar Year	Tax Amount
Bachelors	Clerical	2011	26292.7133
Bachelors	Clerical	2012	29670.195...
Bachelors	Clerical	2013	59855.973...
Bachelors	Clerical	2014	43.3848
Bachelors	Management	2010	572.5232
Bachelors	Management	2011	41220.4452
Bachelors	Management	2012	34821.3409
Bachelors	Management	2013	127173.84
Bachelors	Management	2014	401.8576
Bachelors	Manual	2011	2231.0432
Bachelors	Manual	2012	535.7066
Bachelors	Manual	2013	2770.7031...
Bachelors	Manual	2014	2.1824
Bachelors	Professional	2010	1100.2592
Bachelors	Professional	2011	76995.176...
Bachelors	Professional	2012	68042.321...
Bachelors	Professional	2013	174140.26...

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Results:

Yes, these factors impact the tax amount paid by a customer.

Skilled Manual class of customers pays the highest tax amount?

- Display the sales amount for all products (use product hierarchy) purchased according to the calendar year and filter the results according to the customers' genders. What type of customers bought the most Biking products?

MDX:

Dimension	Hierarchy	Operator	Filter Expression	Param
Customer	Gender	Equal	{ F, M, Unknown }	<input checked="" type="checkbox"/>
Product	Product Model Lines	Equal	{ Accessory, Components, Mountain, Road, Touring }	<input checked="" type="checkbox"/>
Order Date	Order Date.Calendar Year	Equal	{ 2014 }	<input checked="" type="checkbox"/>

Gender	Product Line	Model Name	Product Name	Calendar Year	Sales Amount
F	Accessory	Bike Wash	Bike Wash - ...	2014	174.9
F	Accessory	Classic Vest	Classic Vest, S	2014	254
F	Accessory	Classic Vest	Classic Vest, M	2014	571.5
F	Accessory	Classic Vest	Classic Vest, L	2014	254
F	Accessory	Cycling Cap	AWC Logo Cap	2014	323.64
F	Accessory	Half-Finger...	Half-Finger G...	2014	342.86
F	Accessory	Half-Finger...	Half-Finger G...	2014	293.88
F	Accessory	Half-Finger...	Half-Finger G...	2014	195.92
F	Accessory	Hitch Rack ...	Hitch Rack - ...	2014	1080
F	Accessory	Hydration ...	Hydration Pa...	2014	824.85
F	Accessory	Long-Sleeve...	Long-Sleeve ...	2014	749.85
F	Accessory	Long-Sleeve...	Long-Sleeve ...	2014	649.87
F	Accessory	Long-Sleeve...	Long-Sleeve ...	2014	499.9
F	Accessory	Long-Sleeve...	Long-Sleeve ...	2014	349.93
F	Accessory	Patch kit	Patch Kit/8 P...	2014	208.39
F	Accessory	Short-Slee...	Short-Sleeve...	2014	323.94
F	Accessory	Short-Slee...	Short-Sleeve...	2014	647.88
F	Accessory	Short-Slee...	Short-Sleeve...	2014	107.98
F	Accessory	Short-Slee...	Short-Sleeve...	2014	377.93
F	Accessory	Sport-100	Sport-100 He...	2014	1259.64

Analysis Services Tutorial

MetadataFunctions

Measure Group:
<All>

State-Province

City

Full Name

Birth Date

Date First Purchase

Full Name

Geography Key

Due Date

Order Date

Order Date.Calendar Quarter

Order Date.Calendar Semester

Order Date.Calendar Year

Order Date.Date Key

Order Date.English Month Nam

Order Date.Calendar Date

Product

Financial

History

Stocking

Model Name

Product Line

Product Name

Product Model Lines

Ship Date

SELECT NON EMPTY { [Measures].[Sales Amount] } ON COLUMNS, NON EMPTY { ([Customer].[Gender].[Gender].ALLMEMBERS * [Product].[Product Model Lines].[Product Name].ALLMEMBERS * [Order Date].[Calendar Year].[Calendar Year].ALLMEMBERS) } DIMENSION PROPERTIES MEMBER_CAPTION, MEMBER_UNIQUE_NAME ON ROWS FROM (SELECT (STRTOSET(@OrderDateCalendarYear, CONSTRAINED)) ON COLUMNS FROM (SELECT (STRTOSET(@ProductProductModelLines, CONSTRAINED)) ON COLUMNS FROM (SELECT (STRTOSET(@CustomerGender, CONSTRAINED)) ON COLUMNS FROM [Analysis Services Tutorial])) CELL PROPERTIES VALUE, BACK_COLOR, FORE_COLOR, FORMATTED_VALUE, FORMAT_STRING, FONT_NAME, FONT_SIZE, FONT_FLAGS

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Gender	Product Line	Model Name	Product Name	Calendar Year	Sales Amount
F	Accessory	Bike Wash	Bike Wash - ...	2014	174.9
F	Accessory	Classic Vest	Classic Vest, S	2014	254
F	Accessory	Classic Vest	Classic Vest, M	2014	571.5
F	Accessory	Classic Vest	Classic Vest, L	2014	254
F	Accessory	Cycling Cap	AWC Logo Cap	2014	323.64
F	Accessory	Half-Finger ...	Half-Finger G...	2014	342.86
F	Accessory	Half-Finger ...	Half-Finger G...	2014	293.88
F	Accessory	Half-Finger ...	Half-Finger G...	2014	195.92
F	Accessory	Hitch Rack ...	Hitch Rack - ...	2014	1080
F	Accessory	Hydration ...	Hydration Pa...	2014	824.85
F	Accessory	Long-Sleev...	Long-Sleeve ...	2014	749.85
F	Accessory	Long-Sleev...	Long-Sleeve ...	2014	649.87
F	Accessory	Long-Sleev...	Long-Sleeve ...	2014	499.9
F	Accessory	Long-Sleev...	Long-Sleeve ...	2014	349.93
F	Accessory	Patch kit	Patch Kit/8 P...	2014	208.39
F	Accessory	Short-Slee...	Short-Sleeve...	2014	323.94
F	Accessory	Short-Slee...	Short-Sleeve...	2014	647.88

Excel Pivot Table:

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A10 Touring

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1				
2			16SW04	
3	Order Date.Calendar Date	2014		
4				
5	Sales Amount	Column Labels		
6	Row Labels	F	M	Grand Total
7	+ Accessory	\$12,669.30	\$11,979.53	\$24,648.83
8	+ Mountain	\$7,551.85	\$7,109.05	\$14,660.90
9	+ Road	\$2,296.97	\$2,224.35	\$4,521.32
10	+ Touring	\$1,002.29	\$861.38	\$1,863.67
11	Grand Total	\$23,520.41	\$22,174.31	\$45,694.72

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A7 Accessory

	A	B	C	D
1				
2			16SW04	
3	Order Date.Calendar Date	2014		
4				
5	Sales Amount	Column Labels		
6	Row Labels	F	M	Grand Total
7	+ Accessory	\$12,669.30	\$11,979.53	\$24,648.83
8	+ Bike Wash	\$174.90	\$135.15	\$310.05
9	+ Classic Vest	\$1,079.50	\$825.50	\$1,905.00
10	+ Cycling Cap	\$323.64	\$422.53	\$746.17
11	+ Half-Finger Gloves	\$832.66	\$734.70	\$1,567.36
12	+ Hitch Rack - 4-Bike	\$1,080.00	\$1,320.00	\$2,400.00
13	+ Hydration Pack	\$824.85	\$439.92	\$1,264.77
14	+ Long-Sleeve Logo Jersey	\$2,249.55	\$1,849.63	\$4,099.18
15	+ Patch kit	\$208.39	\$160.30	\$368.69
16	+ Short-Sleeve Classic Jersey	\$1,457.73	\$1,403.74	\$2,861.47
17	+ Sport-100	\$4,058.84	\$4,338.76	\$8,397.60
18	+ Water Bottle	\$379.24	\$349.30	\$728.54
19	+ Mountain	\$7,551.85	\$7,109.05	\$14,660.90
20	+ Road	\$2,296.97	\$2,224.35	\$4,521.32
21	+ Touring	\$1,002.29	\$861.38	\$1,863.67
22	Grand Total	\$23,520.41	\$22,174.31	\$45,694.72

Results:

Female customers bought the most Biking products

4. Display the total days required to manufacture the products (use product hierarchy) according to region and time (use date hierarchy).

MDX:




Dimension	Hierarchy	Operator	Filter Expression	Parameter
Product	Product Model Lines	Equal	{ Accessory, Components, Mountain, Road, Touring }	<input checked="" type="checkbox"/>
Customer	Customer Geography	Equal	{ Australia, Germany, Canada, France, United Kingdom... }	<input checked="" type="checkbox"/>
Order Date	Order Date.Calendar Year	Equal	{ 2014 }	<input type="checkbox"/>


Product Line	Model Name	Product Name	Days To Manufacture	Country-Region	Calendar Year	Total Product Cost
Accessory	Bike Wash	Bike Wash - ...	0	Australia	2014	17.8398
Accessory	Bike Wash	Bike Wash - ...	0	Canada	2014	32.7063
Accessory	Bike Wash	Bike Wash - ...	0	Germany	2014	2.9733
Accessory	Bike Wash	Bike Wash - ...	0	United Kingdom	2014	8.9199
Accessory	Bike Wash	Bike Wash - ...	0	United States	2014	53.5194
Accessory	Classic Vest	Classic Vest, S	0	Australia	2014	23.749
Accessory	Classic Vest	Classic Vest, S	0	Canada	2014	23.749
Accessory	Classic Vest	Classic Vest, S	0	United Kingdom	2014	47.498
Accessory	Classic Vest	Classic Vest, S	0	United States	2014	94.996
Accessory	Classic Vest	Classic Vest, M	0	Australia	2014	71.247
Accessory	Classic Vest	Classic Vest, M	0	Canada	2014	47.498
Accessory	Classic Vest	Classic Vest, M	0	France	2014	23.749
Accessory	Classic Vest	Classic Vest, M	0	Germany	2014	23.749
Accessory	Classic Vest	Classic Vest, M	0	United Kingdom	2014	47.498
Accessory	Classic Vest	Classic Vest, M	0	United States	2014	118.745
Accessory	Classic Vest	Classic Vest, L	0	Australia	2014	47.498
Accessory	Classic Vest	Classic Vest, L	0	Canada	2014	71.247
Accessory	Classic Vest	Classic Vest, L	0	Germany	2014	23.749
Accessory	Classic Vest	Classic Vest, L	0	United States	2014	47.498
Accessory	Cycling Cap	AWC Logo Cap	0	Australia	2014	89.9899





Analysis Services Tutorial	<pre> SELECT NON EMPTY { [Measures].[Total Product Cost] } ON COLUMNS, NON EMPTY { ([Product].[Product Model Lines].[Product Name].ALLMEMBERS * [Product].[Days To Manufacture].[Days To Manufacture].ALLMEMBERS * [Customer].[Customer Geography].[Country-Region].ALLMEMBERS * [Order Date]. [Calendar Year].[Calendar Year].ALLMEMBERS) } DIMENSION PROPERTIES MEMBER_CAPTION, MEMBER_UNIQUE_NAME ON ROWS FROM (SELECT ({ [Order Date].[Calendar Year].&[2014] }) ON COLUMNS FROM (SELECT (STRTOSET(@CustomerCustomerGeography, CONSTRAINED)) ON COLUMNS FROM (SELECT (STRTOSET(@ProductProductModelLines, CONSTRAINED)) ON COLUMNS FROM (SELECT (STRTOSET(@ProductDaysToManufacture, CONSTRAINED)) ON COLUMNS FROM [Analysis Services Tutorial]))))))) CELL PROPERTIES VALUE, BACK_COLOR, FORE_COLOR, FORMATTED_VALUE, FORMAT_STRING, FONT_NAME, FONT_SIZE, FONT_FLAGS </pre>
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Product Line	Model Name	Product Name	Days To Manufacture	Country-Region	Calendar Year	Total Product Cost
Accessory	Bike Wash	Bike Wash - ...	0	Australia	2014	17.8398
Accessory	Bike Wash	Bike Wash - ...	0	Canada	2014	32.7063
Accessory	Bike Wash	Bike Wash - ...	0	Germany	2014	2.9733
Accessory	Bike Wash	Bike Wash - ...	0	United Kingdom	2014	8.9199
Accessory	Bike Wash	Bike Wash - ...	0	United States	2014	53.5194
Accessory	Classic Vest	Classic Vest, S	0	Australia	2014	23.749
Accessory	Classic Vest	Classic Vest, S	0	Canada	2014	23.749
Accessory	Classic Vest	Classic Vest, S	0	United Kingdom	2014	47.498
Accessory	Classic Vest	Classic Vest, S	0	United States	2014	94.996
Accessory	Classic Vest	Classic Vest, M	0	Australia	2014	71.247
Accessory	Classic Vest	Classic Vest, M	0	Canada	2014	47.498
Accessory	Classic Vest	Classic Vest, M	0	France	2014	23.749
Accessory	Classic Vest	Classic Vest, M	0	Germany	2014	23.749
Accessory	Classic Vest	Classic Vest, M	0	United Kingdom	2014	47.498
Accessory	Classic Vest	Classic Vest, M	0	United States	2014	118.745
Accessory	Classic Vest	Classic Vest, L	0	Australia	2014	47.498
Accessory	Classic Vest	Classic Vest, L	0	Canada	2014	71.247












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- Display the order quantity for all the products ordered by customers according to their marital statuses and genders. Filter the results for customers having yearly income greater than or equal to 50,000.

MDX:

Analysis Services Tutorial

Metadata

Measure Group: <All>

- Education
- Gender
- House Owner Flag
- Marital Status
- Number Cars Owned
- Number Children At Home
- Occupation
- Total Children
- Yearly Income
- Location
 - City
 - Country-Region
 - Postal Code
 - State-Province
 - Customer Geography
 - Members
 - Country-Region

Calculated Members

Dimension	Hierarchy	Operator	Filter Expression	Parameter
Product	Product Model Lines	Equal	{ Accessory, Mountain, Components, Road, Touring }	<input checked="" type="checkbox"/>
Customer	Marital Status	Equal	{ M, S }	<input checked="" type="checkbox"/>
Customer	Gender	Equal	{ F, M }	<input checked="" type="checkbox"/>
Customer	Yearly Income	Equal	{ 90000, 80000, 70000, 60000, 50000, 170000, 160000 }	<input checked="" type="checkbox"/>

Product Line	Model Name	Product Name	Marital Status	Yearly Income	Order Quantity
Accessory	Bike Wash	Bike Wash - ...	M	100000	28
Accessory	Bike Wash	Bike Wash - ...	M	110000	8
Accessory	Bike Wash	Bike Wash - ...	M	120000	15
Accessory	Bike Wash	Bike Wash - ...	M	130000	22
Accessory	Bike Wash	Bike Wash - ...	M	150000	6
Accessory	Bike Wash	Bike Wash - ...	M	160000	5
Accessory	Bike Wash	Bike Wash - ...	M	170000	4
Accessory	Bike Wash	Bike Wash - ...	M	50000	11
Accessory	Bike Wash	Bike Wash - ...	M	60000	92
Accessory	Bike Wash	Bike Wash - ...	M	70000	90
Accessory	Bike Wash	Bike Wash - ...	M	80000	64
Accessory	Bike Wash	Bike Wash - ...	M	90000	23
Accessory	Bike Wash	Bike Wash - ...	S	100000	12
Accessory	Bike Wash	Bike Wash - ...	S	110000	12
Accessory	Bike Wash	Bike Wash - ...	S	120000	3
Accessory	Bike Wash	Bike Wash - ...	S	130000	9
Accessory	Bike Wash	Bike Wash - ...	S	150000	2
Accessory	Bike Wash	Bike Wash - ...	S	170000	2

Analysis Services Tutorial

Metadata Functions

Measure Group: <All>

- Education
- Gender
- House Owner Flag
- Marital Status
- Number Cars Owned
- Number Children At Home
- Occupation
- Total Children
- Yearly Income
- Location
 - City
 - Country-Region
 - Postal Code
 - State-Province
 - Customer Geography
 - Members
 - Country-Region
 - State-Province
 - City
 - Full Name
 - Birth Date
 - Date First Purchase
 - Full Name
 - Geography Key
 - Due Date

```

SELECT NON EMPTY { [Measures].[Order Quantity] } ON COLUMNS, NON EMPTY { ([Product].[Product Model Lines].[Product Name].ALLMEMBERS *
[Customer].[Marital Status].[Marital Status].ALLMEMBERS * [Customer].[Yearly Income].[Yearly Income].ALLMEMBERS ) } DIMENSION PROPERTIES
MEMBER_CAPTION, MEMBER_UNIQUE_NAME ON ROWS FROM ( SELECT ( STRTOSET(@CustomerYearlyIncome, CONSTRAINED) ) ON COLUMNS FROM (
SELECT ( STRTOSET(@CustomerGender, CONSTRAINED) ) ON COLUMNS FROM ( SELECT ( STRTOSET(@CustomerMaritalStatus, CONSTRAINED) ) ON
COLUMNS FROM ( SELECT ( STRTOSET(@ProductProductModelLines, CONSTRAINED) ) ON COLUMNS FROM [Analysis Services Tutorial] ) ) ) WHERE ( IIF(
STRTOSET(@CustomerGender, CONSTRAINED).Count = 1, STRTOSET(@CustomerGender, CONSTRAINED), [Customer].[Gender].currentmember ) ) CELL
PROPERTIES VALUE, BACK_COLOR, FORE_COLOR, FORMATTED_VALUE, FORMAT_STRING, FONT_NAME, FONT_SIZE, FONT_FLAGS
  
```

16SW04 Jawaria Sattar

Product Line	Model Name	Product Name	Marital Status	Yearly Income	Order Quantity
Accessory	Bike Wash	Bike Wash - ...	M	100000	28
Accessory	Bike Wash	Bike Wash - ...	M	110000	8
Accessory	Bike Wash	Bike Wash - ...	M	120000	15
Accessory	Bike Wash	Bike Wash - ...	M	130000	22
Accessory	Bike Wash	Bike Wash - ...	M	150000	6
Accessory	Bike Wash	Bike Wash - ...	M	160000	5
Accessory	Bike Wash	Bike Wash - ...	M	170000	4
Accessory	Bike Wash	Bike Wash - ...	M	50000	11
Accessory	Bike Wash	Bike Wash - ...	M	60000	92
Accessory	Bike Wash	Bike Wash - ...	M	70000	90
Accessory	Bike Wash	Bike Wash - ...	M	80000	64
Accessory	Bike Wash	Bike Wash - ...	M	90000	23
Accessory	Bike Wash	Bike Wash - ...	S	100000	12
Accessory	Bike Wash	Bike Wash - ...	S	110000	12
Accessory	Bike Wash	Bike Wash - ...	S	120000	3
Accessory	Bike Wash	Bike Wash - ...	S	130000	9
Accessory	Bike Wash	Bike Wash - ...	S	150000	2

Excel Pivot Table:

AutoSave Off COPY - Excel PivotTable Tools

File Home Insert Page Layout Formulas Data Review View Help Analyze

Clipboard: Paste, Cut, Copy, Format Painter

Font: Calibri, 11, Bold, Italic, Underline, Text Color, Background Color

Alignment: Wrap Text, Merge & Center

B3: (Multiple Items)

16SW04

Yearly Income (Multiple Items)

Search Yearly Income

☒ All

- ☐ 10000
- ☒ 100000
- ☒ 110000
- ☒ 120000
- ☒ 130000
- ☒ 150000
- ☒ 160000
- ☒ 170000
- ☐ 20000
- ☐ 30000
- ☐ 40000
- ☒ 50000
- ☒ 60000
- ☒ 70000
- ☒ 80000
- ☒ 90000
- ☐ Unknown

☒ Select Multiple Items

OK Cancel

S	M	S Total	Grand Total
3,114	2,505	5,619	13,806
2,398	1,930	4,328	10,921
2,098	1,737	3,835	8,530
603	529	1,132	2,486
8,213	6,701	14,914	35,743

AutoSave Off COPY - Excel PivotTable Tools

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Font: Calibri, 11, Bold, Italic, Underline, Text Color, Background Color

Alignment: Wrap Text, Merge & Center

B3: (Multiple Items)

16SW04

Yearly Income (Multiple Items)

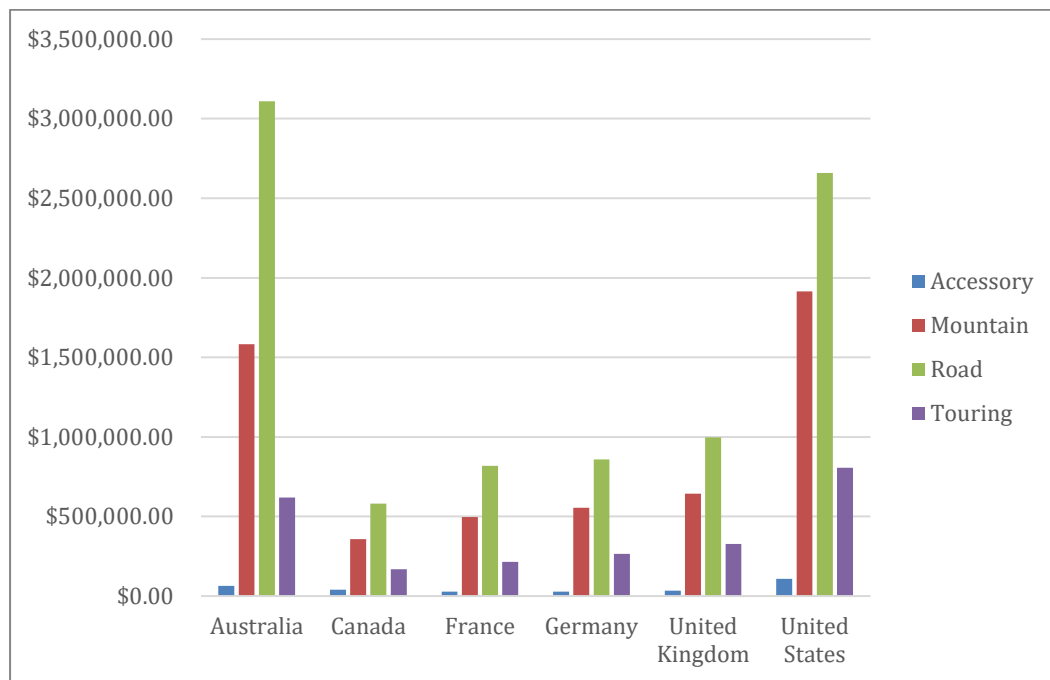
Order Quantity Column Labels

Row Labels

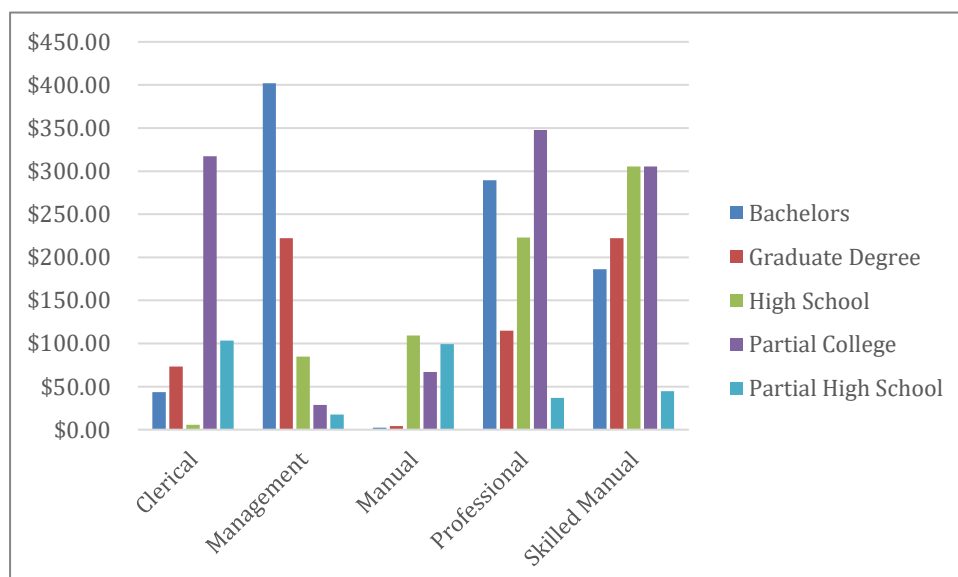
	M	M Total	S	S Total	Grand Total
Accessory	3,792	4,395	8,187	3,114 2,505	5,619 13,806
Mountain	3,039	3,554	6,593	2,398 1,930	4,328 10,921
Road	2,217	2,478	4,695	2,098 1,737	3,835 8,530
Touring	644	710	1,354	603 529	1,132 2,486
Grand Total	9,692	11,137	20,829	8,213 6,701	14,914 35,743

6. Generate pivot charts for any 3 scenarios mentioned above to better visualize the data.

Display the standard cost of all the products along with their categories according to the regions in which they were sold. Which region is the most and the least expensive according to the result retrieved?



Display the Tax amount for customers according to their educations and occupations over calendar year. Do these factors impact the tax amount paid by a customer? Which class of customers pays the highest tax amount?



Display the sales amount for all products (use product hierarchy) purchased according to the calendar year and filter the results according to the customers' genders. What type of customers bought the most Biking products?

