INFOSYS 330 Assignment #1 Documentation

Submitter details

Name: Prince Bhatia

UPI: Pbha310

(Task 1) Selected stakeholder and area:

The stakeholder chosen for the area of study for this assignment is the Products team. Their main goal is to "Increase market share by extending product availability" by using a Data Warehouse.

To help aid the decision making process are the following three questions :

1. Which products are the most profitable and should be made widely available?
2. Which products are the least profitable?
3. What are the most/least popular products? How do these correlate to revenue/cost?

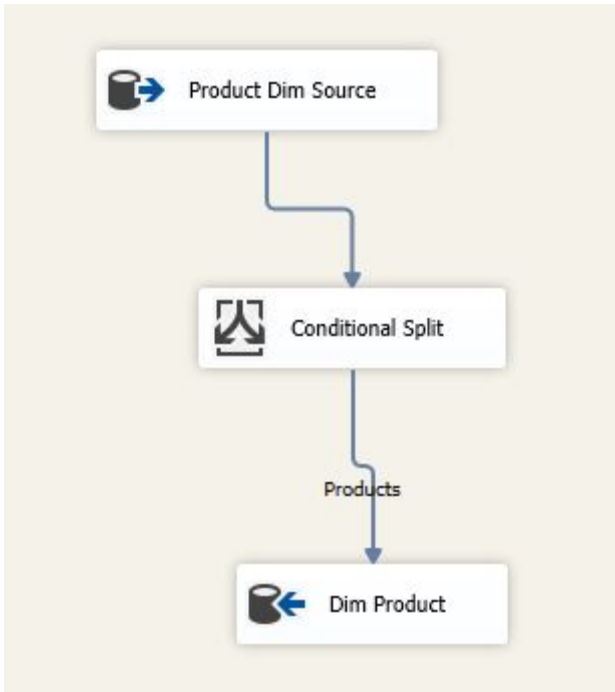## Task 2 – Documentation of DW design
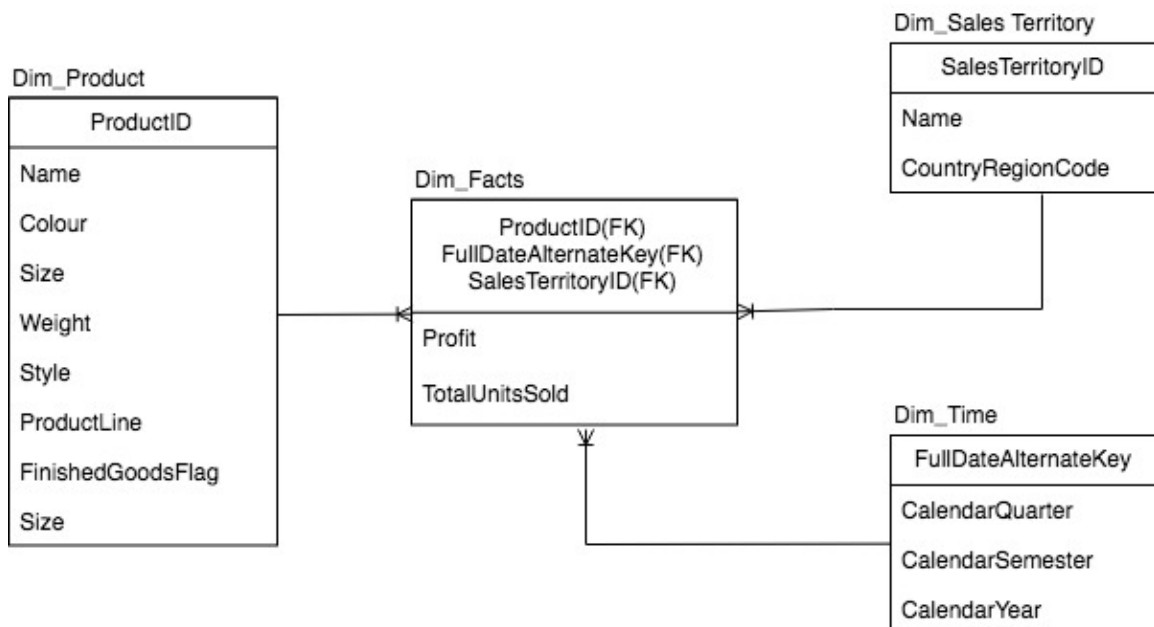
The image shows the DW ERD/Schema schema designed to help answer the questions aforementioned by the stakeholder. The star schema has Dim_Product, Dim_time, Dim_SalesTerritory and Dim_Facts as the tables shown above.

Task 3 – Documentation of ETL
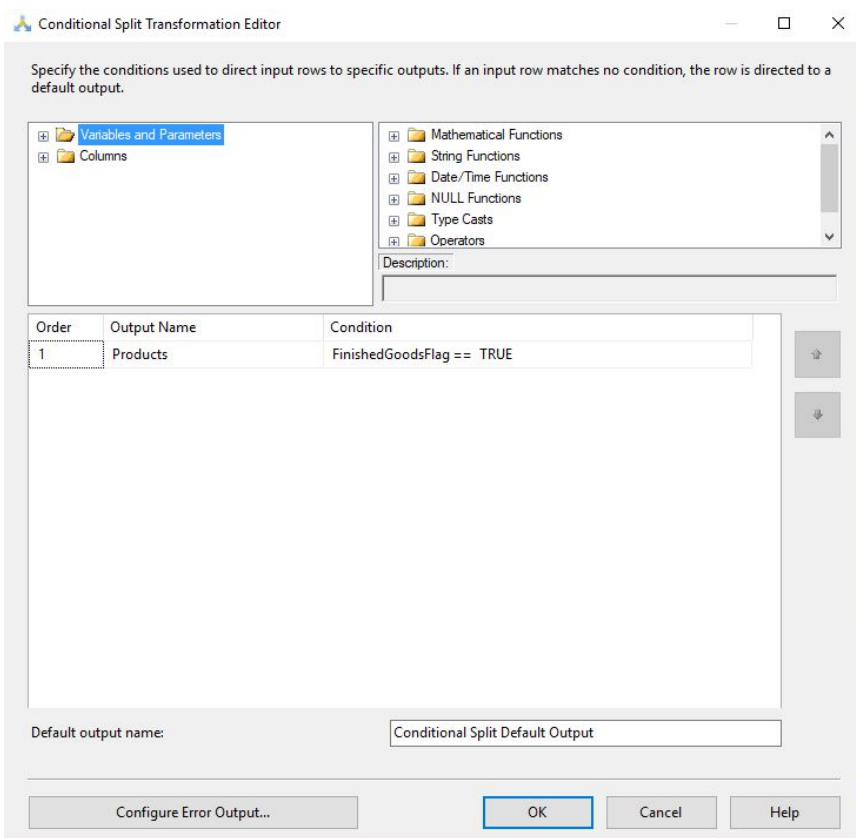
1. Product Dimension

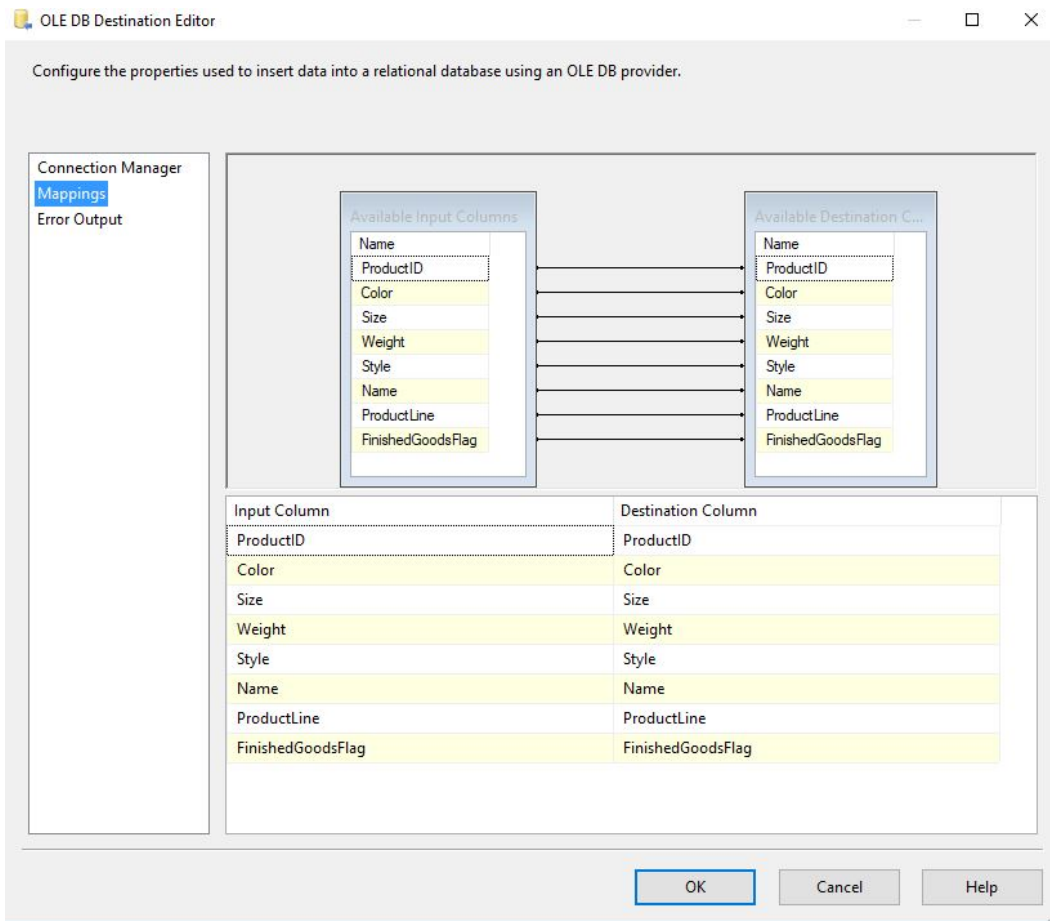This is the Product Dimension ETL.

This is the Product Dim source.

The conditional split is created to filter out if products are in stock or not.

This is a conditional spilt made to find out if a product is in stock or not. It is always True or False. FinishedGoodsFlag

Showings the mapping.
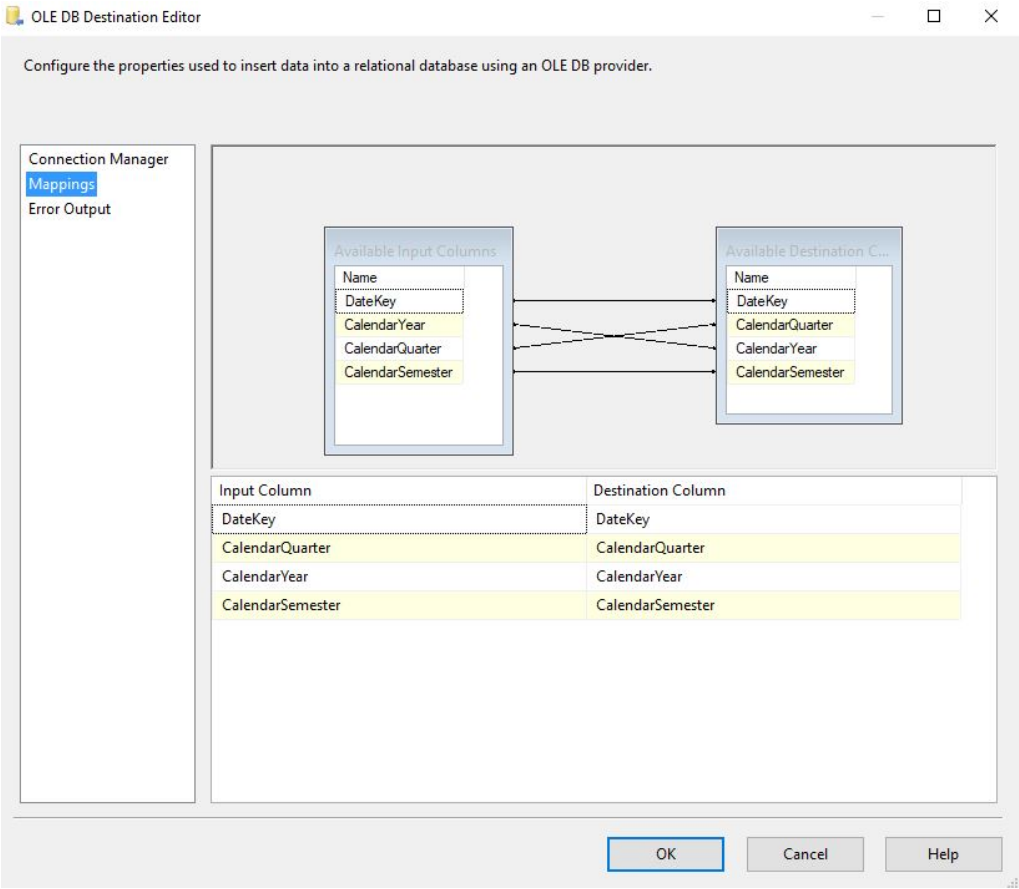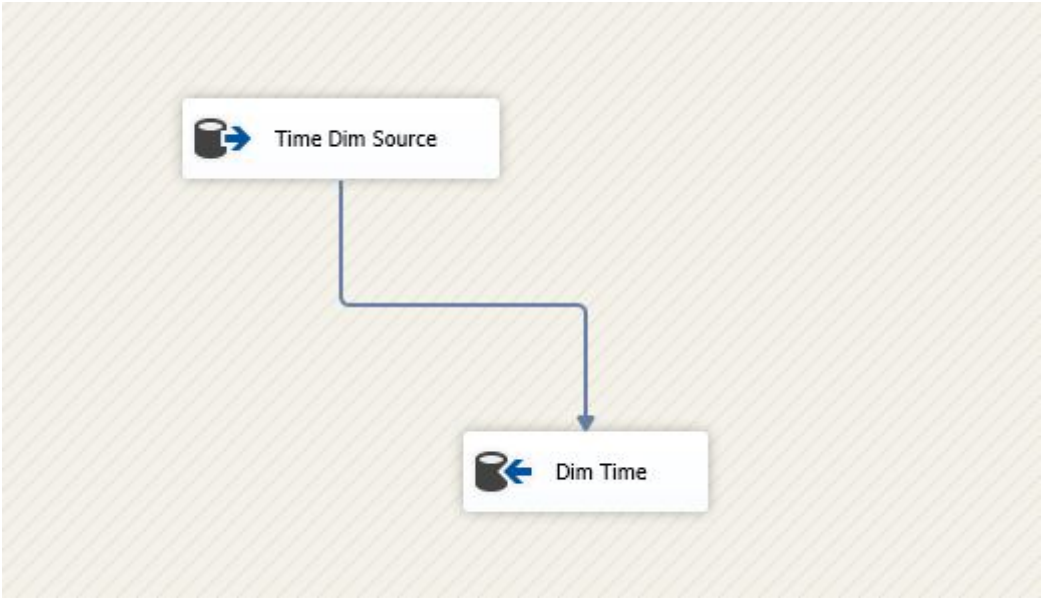

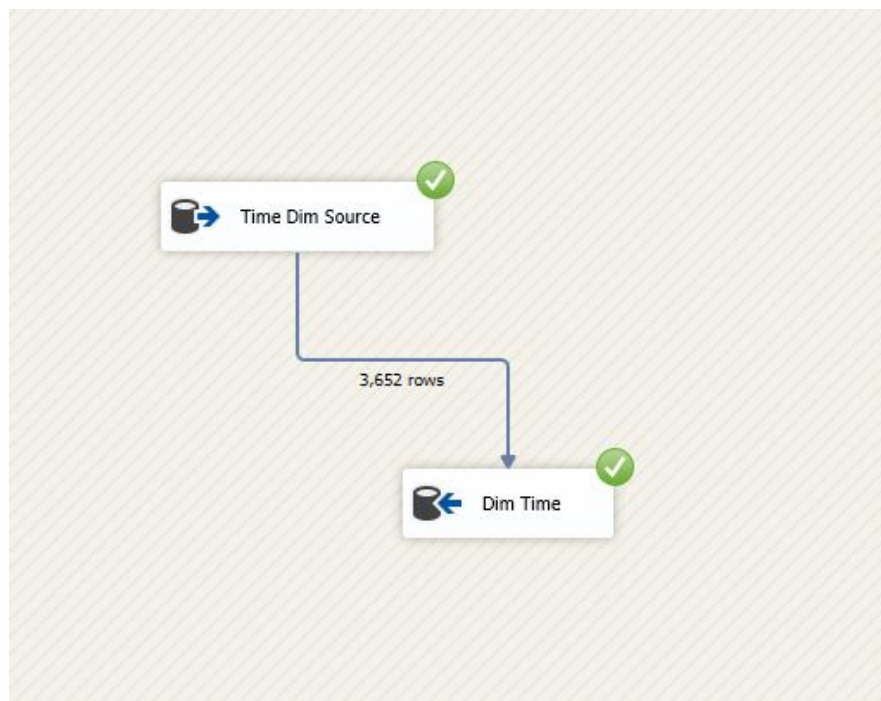This is showing the ETL successfully created.

2. Time Dimension

Time Dimension ETL

To create the Time ETL I used the Lab example. I ran the ETL in my database using the SQL file.
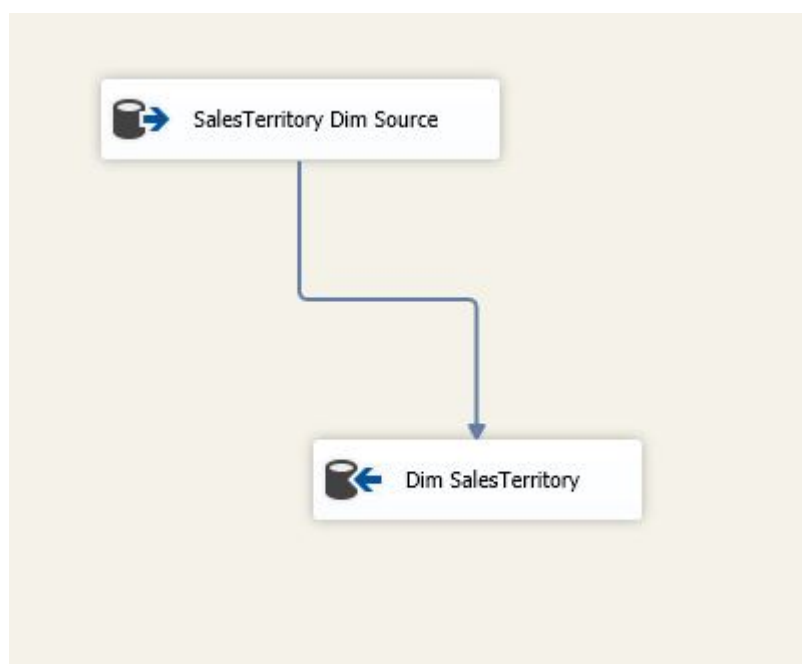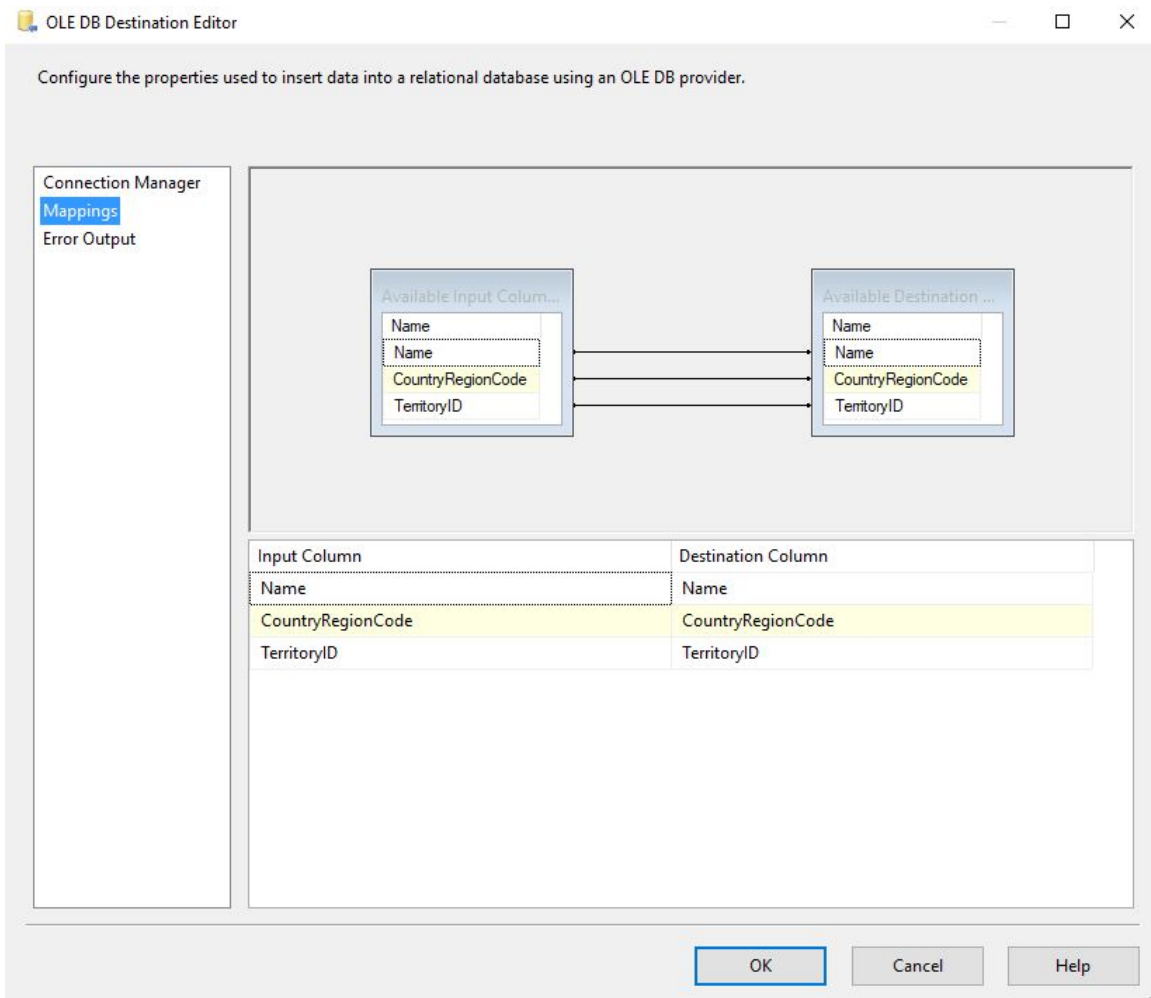

Showing the mapping

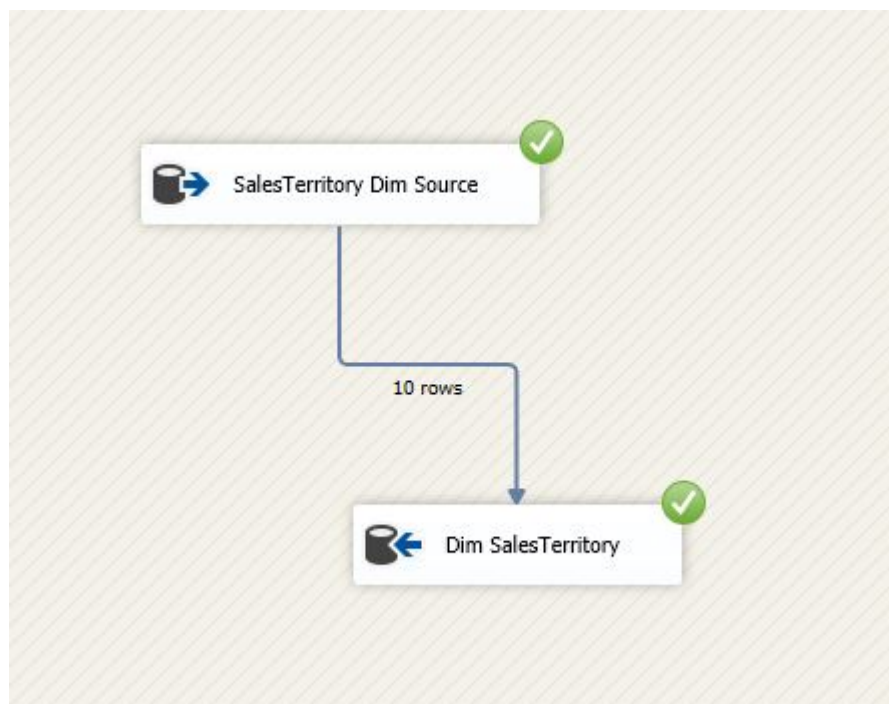This is showing the ETL successfully created

Part 3. SalesTerritory

Shows the ETL created.

This screenshot shows the mapping.

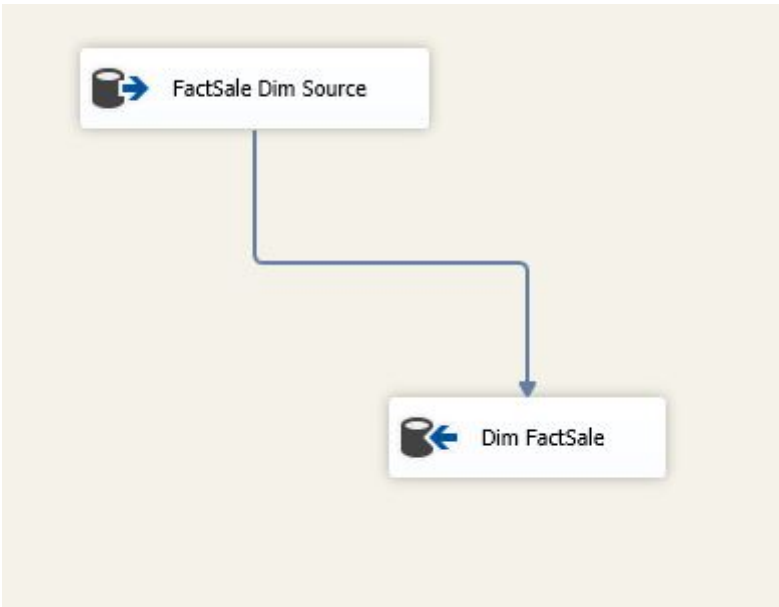This is showing the ETL successfully created

Part 4. Fact ETL

 This is the Facts ETL created

Column	Alias	Table	Outp...	Sort Type	Sort Order	Filter	Or...	Or...	Or...
FullDateAlternateKey		AdventureWorks_Time	☑						
ProductID		Product (Production)	☑						
TerritoryID		SalesTerritory (Sales)	☑						
OrderQty	TotalSoldUnits	SalesOrderDetail (Sales)	☑						
Sales.SalesOrderDetail.LineTotal - Production.Product.StandardCost * Sales.SalesOrderDetail.OrderQty	[Profit Made]		☑						
			▣						
			▣						
			▣						

```
SELECT    AdventureWorks_Time.FullDateAlternateKey, Production.Product.ProductID, Sales.SalesTerritory.TerritoryID, Sales.SalesOrderDetail.OrderQty AS TotalSoldUnits,
          Sales.SalesOrderDetail.LineTotal - Production.Product.StandardCost * Sales.SalesOrderDetail.OrderQty AS [Profit Made]
FROM      Sales.SalesTerritory INNER JOIN
          Sales.SalesOrderHeader ON Sales.SalesTerritory.TerritoryID = Sales.SalesOrderHeader.TerritoryID AND Sales.SalesTerritory.TerritoryID = Sales.SalesOrderHeader.TerritoryID INNER JOIN
          Sales.SalesOrderDetail ON Sales.SalesOrderHeader.SalesOrderID = Sales.SalesOrderDetail.SalesOrderID AND Sales.SalesOrderHeader.SalesOrderID = Sales.SalesOrderDetail.SalesOrderID INNER JOIN
          Production.Product ON Sales.SalesOrderDetail.ProductID = Production.Product.ProductID INNER JOIN
          pbha310_A.dbo.DimDate AS AdventureWorks_Time ON Sales.SalesOrderHeader.OrderDate = AdventureWorks_Time.FullDateAlternateKey
```

This screenshot shows the SQL command used to create the build query function.

Also shows how we calculated total sold units and the profit.
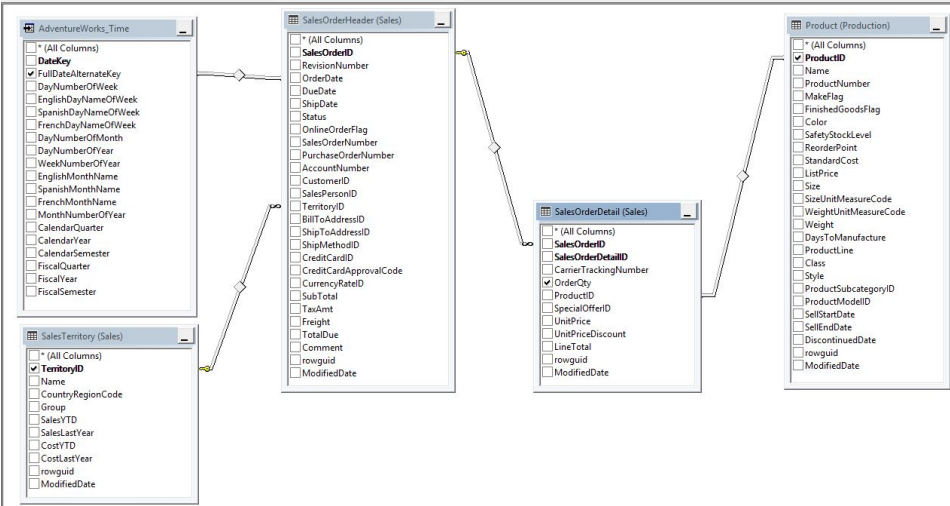
The tables used to build query.

Preview Query Results

Query result (up to the first 200 rows):

FullDateAlt...	ProductID	TerritoryID	TotalSoldU...	Profit Made
1/07/200...	776	5	1	126.899600
1/07/200...	777	5	3	380.698800
1/07/200...	778	5	1	126.899600
1/07/200...	771	5	1	127.839600
1/07/200...	772	5	1	127.839600
1/07/200...	773	5	2	255.679200
1/07/200...	774	5	1	127.839600
1/07/200...	714	5	3	-28.955700
1/07/200...	716	5	1	-9.651900
1/07/200...	709	5	6	13.822200
1/07/200...	712	5	2	-3.471600
1/07/200...	711	5	4	28.400800
1/07/200...	762	5	1	-67.247700
1/07/200...	758	5	1	-9.914300
1/07/200...	745	6	1	110.667200
1/07/200...	743	6	1	-24.336700

Close

This is the output from the preview generated after the built query

OLE DB Destination Editor

Configure the properties used to insert data into a relational database using an OLE DB provider.

Connection Manager
Mappings
Error Output

Available Input Columns

Name
FullDateAlternateKey
TerritoryID
ProductID
Profit
TotalUnitsSold

Available Destination Colu...

Name
FullDateAlternateKey
ProductID
TerritoryID
TotalUnitsSold
Profit

Input Column	Destination Column
FullDateAlternateKey	FullDateAlternateKey
ProductID	ProductID
TerritoryID	TerritoryID
TotalUnitsSold	TotalUnitsSold
Profit	Profit

OK   Cancel   Help

This screenshot shows the mapping
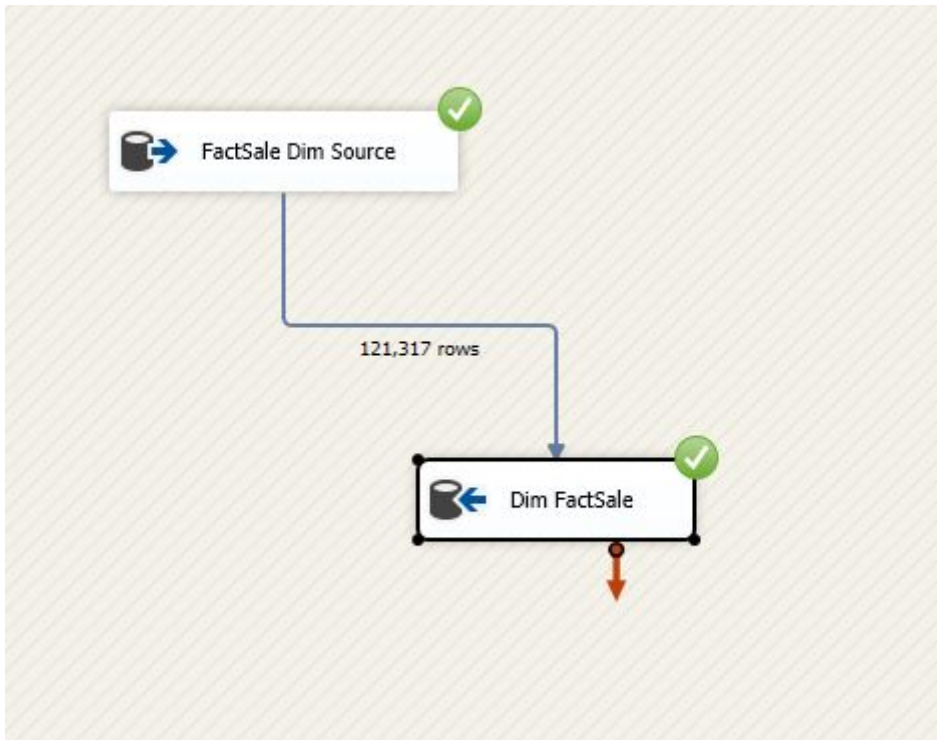
This is showing the ETL successfully created
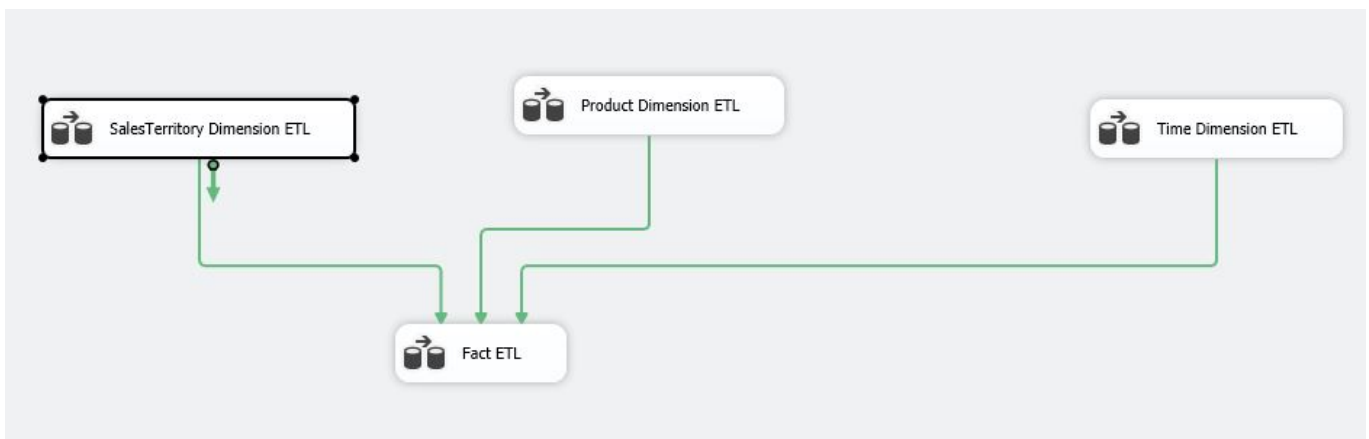
This is showing the Fact table ETL successfully created and all the ETL used.

Task 4 – Documentation of Cube construction
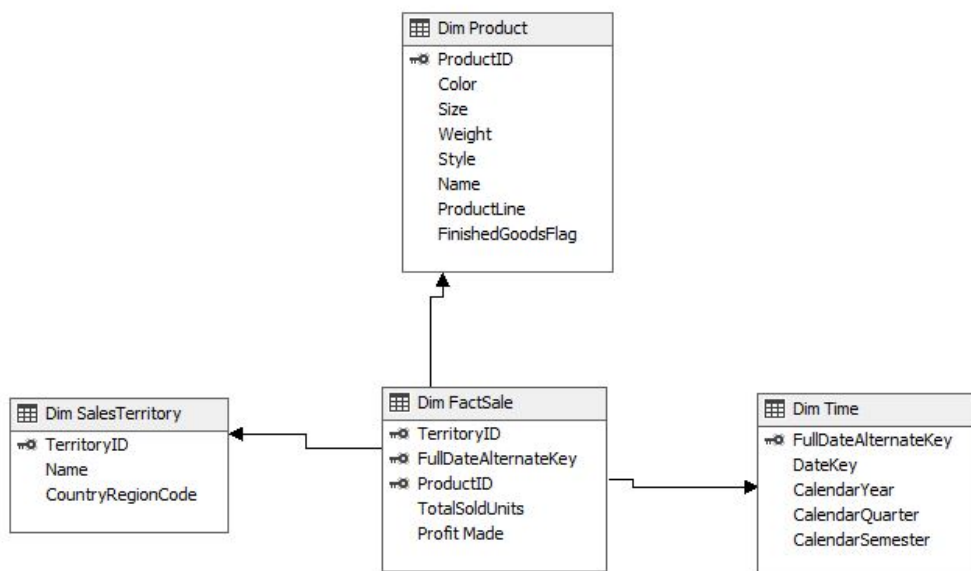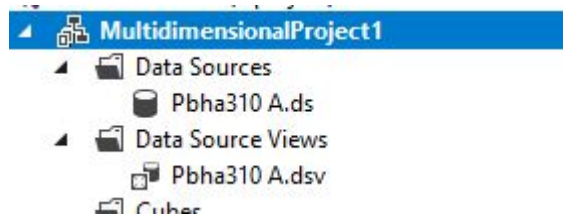
This screenshot shows the DW after all the links have been made from Data Source view.
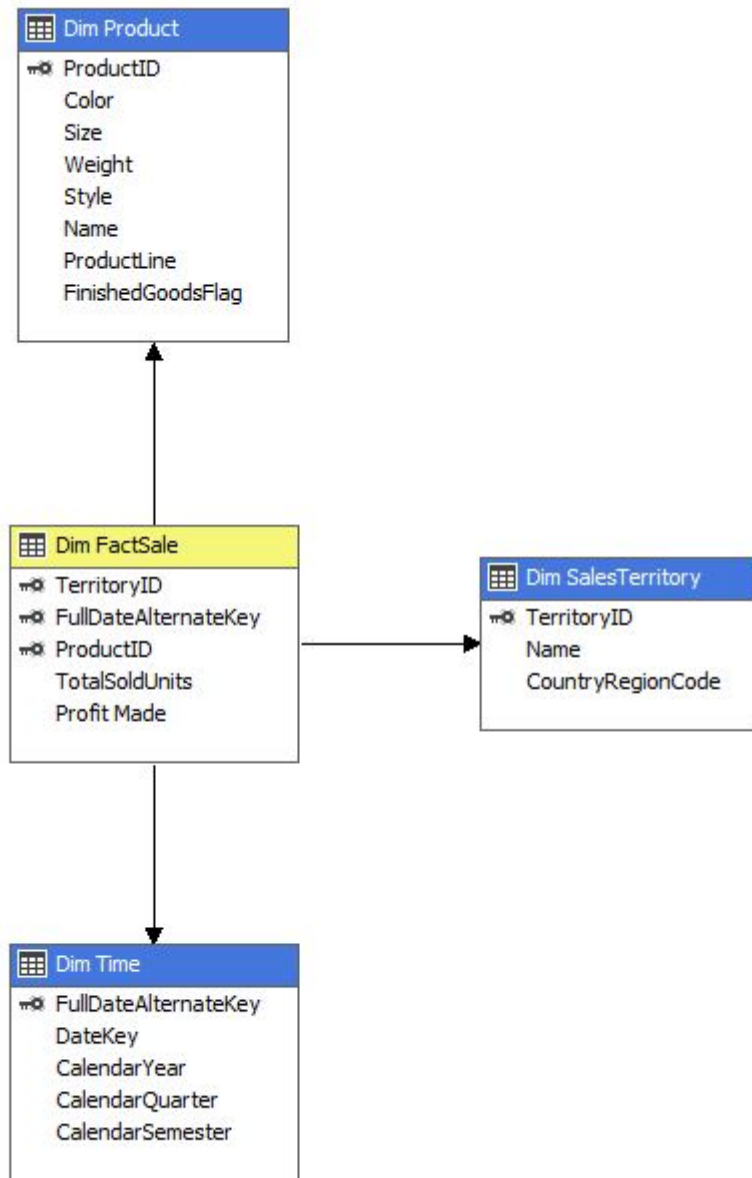
This screenshot shows the same Schema created above using the cube.
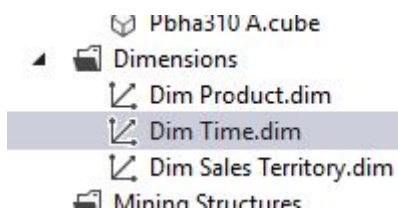
This screenshot shows the dimensions created.
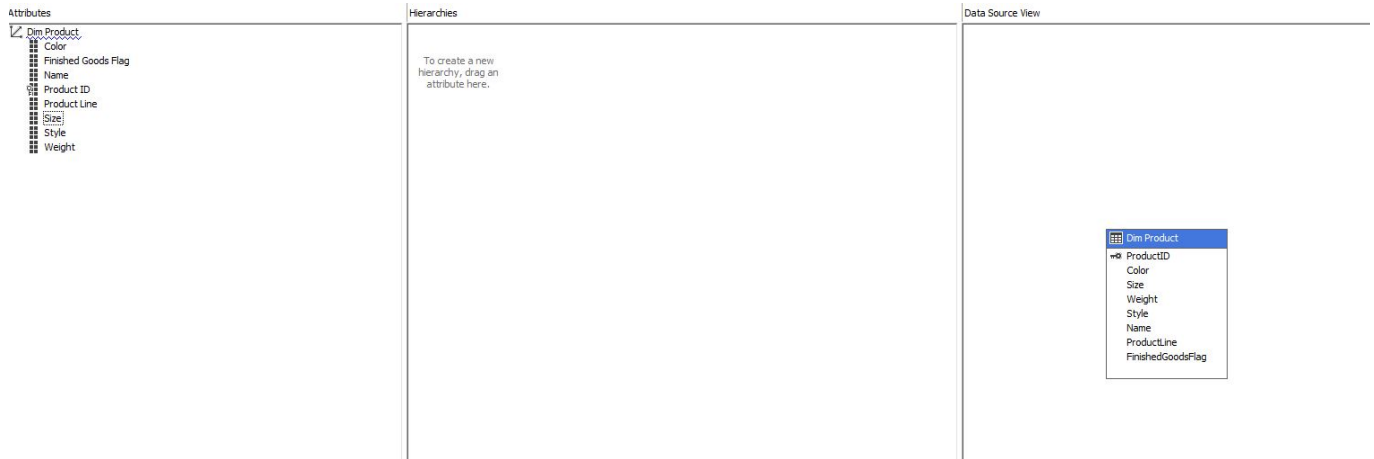
This shows product dimension and the attributes edited to get all the attributes in the attributes column.
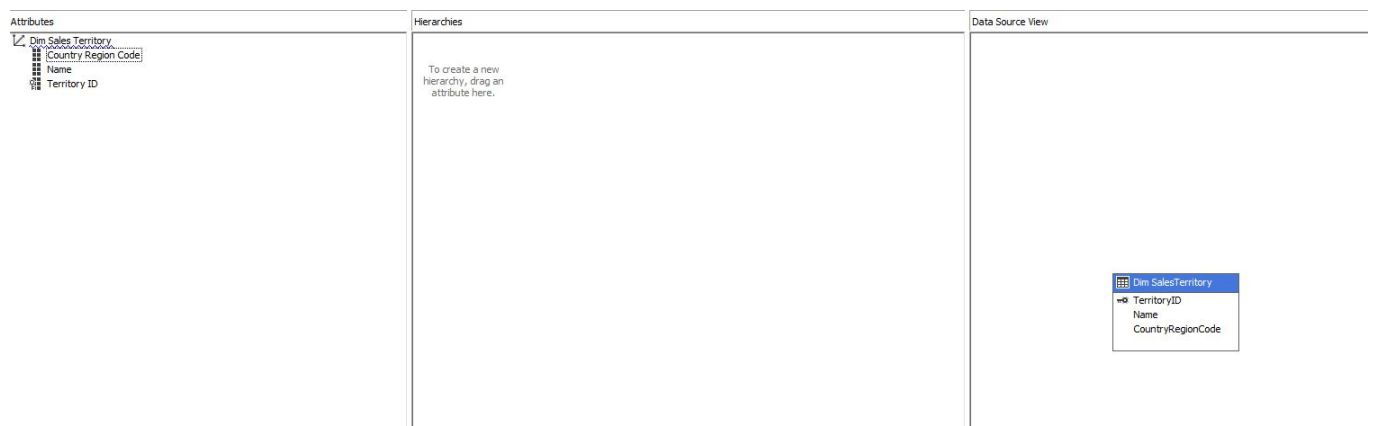
This shows Sales territory dimension and the attributes edited to get all the attributes in the attributes column.

This shows Time dimension and the attributes edited to get all the attributes in the attributes column.
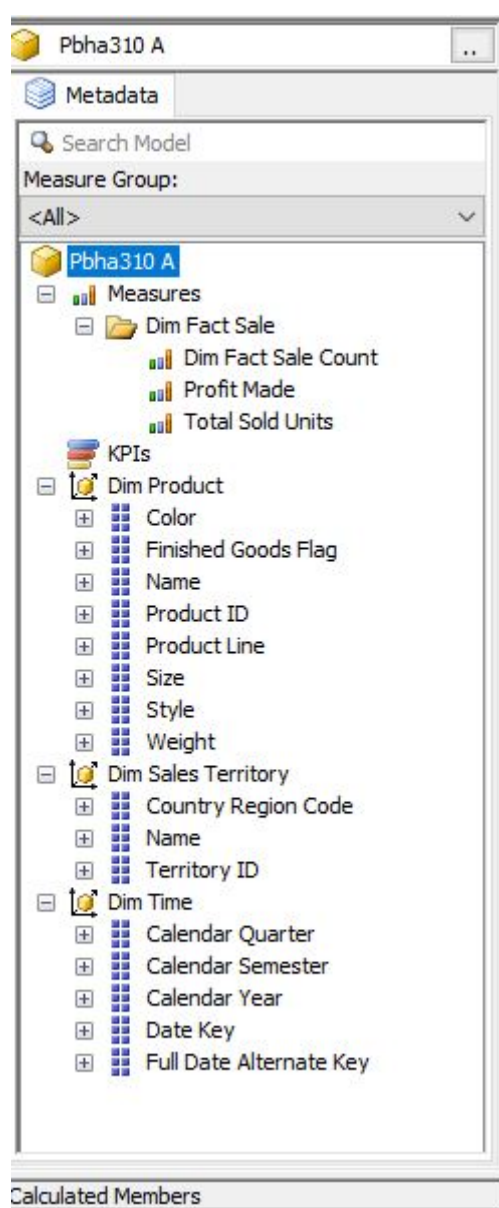
This screenshot shows all the attributes added to use on the cube.
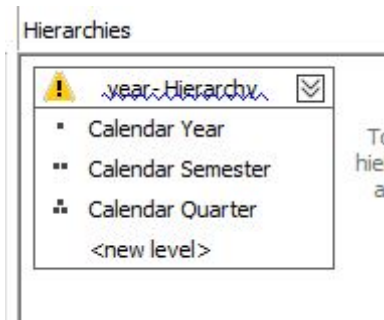
This shows the time hierarchy created with its attributes.
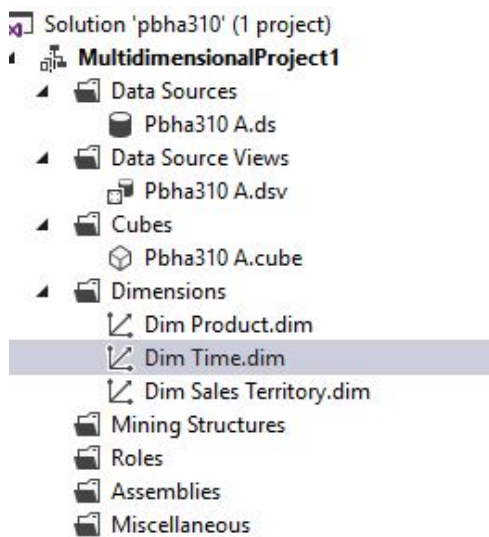
This shows everything used and created for this task successfully.
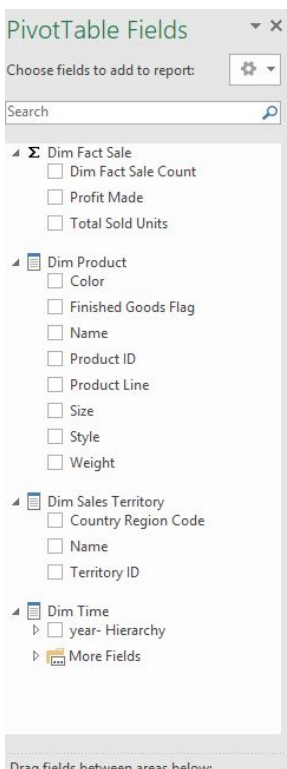
This shows the excel Pivot Table created and used through the cube browser.

Task 5 – Documentation of usage for end-user/stakeholder

1. **Which products are the most profitable and should be made widely available?**

Row Labels	Profit Made	Total Sold Units
Mountain-200 Black, 42	$ 674,216.58	2664
Mountain-200 Black, 38	$ 673,444.47	2977
Mountain-200 Black, 46	$ 666,740.69	2111
Mountain-200 Silver, 38	$ 663,784.94	2394
Mountain-200 Silver, 46	$ 629,644.13	2216
Mountain-200 Silver, 42	$ 611,084.90	2234
Road-150 Red, 48	$ 470,355.02	493
Road-150 Red, 62	$ 466,320.17	600
Road-150 Red, 52	$ 421,110.87	458
Road-150 Red, 56	$ 406,079.28	664
Grand Total	$ 5,682,781.05	16811

This screenshot shows the top 10 products sold Within Adventure Works Cycles(AWC). It clearly shows that **Mountain-200 Black,42** is the most profitable. The Data has been reformatted to make it easier to read for the profit and total Sold Units.

Top 10 Filter (Name)   ?   ✕

Show

| Top | ∨ | 10 | ⬍ | Items | ∨ | by | Profit Made | ∨ |

OK   Cancel

This is the filter used to get the top 10 profit made for AWC. From the above screenshot it shows **Mountain-200 Black,42** is the most profitable item in AWC. It profited $674,216.58 which was the highest in the table. Different similarities of the same bike were closely followed. **Mountain-200 Black,38** was the second most profitable for the company. This bike generated $673,444.47. The second range is **Mountain-200 Silver,38** which generated $663,784.94. The two ranges AWC should focus on making more widely available is **Mountain-200 Black,42** and **Mountain-200 Silver,38**. **Mountain-200 Black,42** should be the majority focus for AWC as it generates the most profit.

Row Labels	Column Labels Profit Made 2006	2007	2008	Total Sold Units 2006	2007	2008	Total Profit Made	Total Total Sold Units
Mountain-200 Black, 42	$ 44,759.35	$ 321,343.33	$ 308,113.90		711	1289	664 $ 674,216.58	2664
AU	$ 25,507.74	$ 81,672.70	$ 53,568.48	32	101	54 $	160,748.92	187
CA	$ 1,516.95	$ 38,506.34	$ 32,365.05	151	214	90 $	72,388.35	455
DE	$ 3,188.47	$ 10,567.50	$ 34,751.42	4	17	43 $	48,507.39	64
FR	$ 4,287.21	$ 38,092.55	$ 20,265.85	28	105	51 $	62,645.60	184
GB	$ 5,340.90	$ 38,730.01	$ 45,470.73	54	116	70 $	89,541.64	240
US	$ 4,918.07	$ 113,774.24	$ 121,692.38	442	736	356 $	240,384.69	1534

From this table the US region makes the most profit, for the product **Mountain -200 Black,42.** Compared to Australia which made the second largest profit, the number of units sold is really low compared to the US. US sold a total of 1534 units sold compared to Australia which sold 664. The profit generated for US is on a steady increase opposed to Australia which is on a decline. Therefore from this conclusion **Mountain-200 Black,42** should be more widely available to the US market.

2. Which products are the least profitable?

Row Labels	Profit Made	Total Sold Units
Touring-3000 Blue, 50	-$ 39,493.57	841
Road-650 Red, 48	-$ 40,235.40	1888
Road-650 Black, 58	-$ 40,995.27	1871
Road-650 Red, 62	-$ 42,967.78	1896
Long-Sleeve Logo Jersey, L	-$ 55,158.73	6577
Road-650 Black, 52	-$ 61,914.20	2270
Touring-1000 Yellow, 46	-$ 62,974.72	1005
Road-650 Red, 60	-$ 69,800.11	2232
Touring-1000 Yellow, 60	-$132,745.72	1114
Road-650 Red, 44	-$153,696.12	2254
Grand Total	-$699,981.62	21948

From this screenshot it shows the top 10 least profitable items in AWC. It is shown in the order of the largest to less profitable items. The screenshot shows **Road-650 Red, 44** is the least profitable item.

	Column Labels									Total Total Sold Units	Total Profit Made
	Total Sold Units				Profit Made						
Row Labels	+2005	+2006	+2007	+2008	+2005	+2006	+2007	+2008			
⊟ Road-650 Red, 44	354	1188	707	5	-$21,848.21	-$124,184.30	-$8,048.84	$385.23		2254	-$ 153,696.12
Australia	2	16	9		$ 424.78	$ 4,069.40	$2,666.55			27	$ 7,160.73
Canada	81	246	138		-$ 5,447.06	-$ 27,728.28	-$4,069.51			465	-$ 37,244.86
Central	42	114	78		-$ 2,824.40	-$ 11,833.98	-$1,319.18			234	-$ 15,977.57
France	1	65	47		$ 212.39	-$ 8,099.25	$ 457.89			113	-$ 7,428.97
Germany	1	6	8	5	$ 212.39	$ 1,442.13	$1,274.08	$385.23		20	$ 3,313.84
Northeast	71	152	97		-$ 4,774.59	-$ 17,268.07	-$3,290.67			320	-$ 25,333.33
Northwest	23	70	61		-$ 1,546.70	-$ 9,565.23	-$ 75.79			154	-$ 11,187.72
Southeast	34	124	52		-$ 2,286.42	-$ 13,579.78	-$ 879.46			210	-$ 16,745.66
Southwest	98	360	183		-$ 6,031.00	-$ 35,235.19	-$3,490.49			641	-$ 44,756.68
United Kingdom	1	35	34		$ 212.39	-$ 6,386.07	$ 677.76			70	-$ 5,495.92
Grand Total	354	1188	707	5	-$21,848.21	-$124,184.30	-$8,048.84	$385.23		2254	-$ 153,696.12

From this screenshot it shows that all the regions in the US are making negative profit for the **Road-650 Red, 44** item in AWC. Australia and Germany are the most profitable for this product but the total units sold are relatively low to keep this item in AWC stock range. Stock should be decreased in the US and shifted towards Germany and Australia where profit is being generated. Therefore concluded from these screenshots it shows that **Road-650 Red, 44** is the least profitable item in AWC from the US region.

3. What are the most/least popular products? How do these correlate to revenue/cost?

Row Labels	Profit Made	Total Sold Units
Long-Sleeve Logo Jersey, M	-24915.74642	3618
Patch Kit/8 Patches	4760.239632	3752
Short-Sleeve Classic Jersey, XL	-31663.64488	3850
Classic Vest, S	55337.30995	4242
Sport-100 Helmet, Red	74612.74249	6213
Sport-100 Helmet, Black	74097.48794	6473
Long-Sleeve Logo Jersey, L	-55158.73174	6577
Sport-100 Helmet, Blue	75873.37785	6684
Water Bottle - 30 oz.	15601.09293	6708
AWC Logo Cap	-6444.460977	8242
Grand Total	182099.6668	56359

This screenshot shows the most popular items, **AWC Logo Cap** being the most popular item in AWC product range. Most of the items are clothing as they are a lot cheaper than bikes, there they have higher total units sold.

	Column Labels										
	2005		2006		2007		2008		Total Total Sold Units	Total Profit Made
Row Labels	Total Sold Units	Profit Made	Total Sold Units	Profit Made	Total Sold Units	Profit Made	Total Sold Units	Profit Made		
AWC Logo Cap	520 -$ 912.72		1853 -$ 3,439.41		3562 -$ 2,900.13		2307 $ 807.80		8242 -$	6,444.46
Australia					296 $ 131.66		310 $ 385.31		606 $	516.97
Canada	141 -$ 248.30		457 -$ 852.73		683 -$ 896.43		345 -$ 39.34		1626 -$	2,036.80
Central	67 -$ 122.85		168 -$ 291.61		256 -$ 464.30		93 -$ 148.67		584 -$	1,027.43
France			83 -$ 154.12		287 -$ 137.22		210 $ 146.91		580 -$	144.43
Germany					277 -$ 90.39		274 $ 160.22		551 $	69.82
Northeast	37 -$ 64.22		156 -$ 280.89		237 -$ 411.51		84 -$ 121.19		514 -$	877.81
Northwest	66 -$ 114.56		217 -$ 399.45		340 -$ 175.23		254 $ 180.82		877 -$	508.42
Southeast	70 -$ 121.51		209 -$ 389.83		189 -$ 325.55		69 -$ 105.83		537 -$	942.72
Southwest	139 -$ 241.28		501 -$ 959.33		647 -$ 476.53		398 $ 129.40		1685 -$	1,547.73
United Kingdom			62 -$ 111.44		350 -$ 54.62		270 $ 220.16		682 $	54.09
Water Bottle - 30 oz.					3296 $ 7,022.59		3412 $ 8,578.51		6708 $	15,601.09
Australia					403 $ 1,103.16		494 $ 1,457.28		897 $	2,560.44
Canada					551 $ 1,075.70		503 $ 1,220.09		1054 $	2,295.79
Central					113 $ 119.64		98 $ 102.43		211 $	222.08
France					277 $ 593.15		286 $ 701.81		563 $	1,294.96
Germany					353 $ 700.28		315 $ 773.91		668 $	1,474.19
Northeast					137 $ 138.49		102 $ 115.23		239 $	253.73
Northwest					434 $ 1,021.11		493 $ 1,308.35		927 $	2,329.46
Southeast					116 $ 113.14		75 $ 88.36		191 $	201.49
Southwest					595 $ 1,389.32		691 $ 1,863.28		1286 $	3,252.60
United Kingdom					317 $ 768.60		355 $ 947.76		672 $	1,716.36
Grand Total	520 -$ 912.72		1853 -$ 3,439.41		6858 $ 4,122.46		5719 $ 9,386.31		14950 $	9,156.63

This screenshot shows the least poplar item in AWC product range in a more detailed view.

Row Labels	Profit Made	Total Sold Units
LL Touring Frame - Blue, 58	$ 0.80	4
ML Mountain Frame-W - Silver, 38	$ 133.55	7
LL Mountain Frame - Black, 40	$ 104.71	8
HL Mountain Frame - Black, 44	$ 1,881.34	17
LL Mountain Frame - Black, 52	$ 196.34	15
LL Mountain Frame - Silver, 48	$ 608.79	44
LL Road Seat/Saddle	$ 42.31	10
LL Touring Frame - Blue, 44	$ 5.00	25
LL Touring Frame - Blue, 62	$ 3.00	15
LL Touring Frame - Yellow, 58	$ 7.20	36
Grand Total	$ 2,983.05	181

This screenshot shows the least popular items, **LL Touring Frame – Blue, 58** being the least popular item in AWC product range.

Row Labels	Column Labels Total Sold Units ⊞2007	Profit Made ⊞2007	Total Total Sold Units	Total Profit Made
⊟LL Touring Frame - Blue, 58	4	$ 0.80	4	$ 0.80
Australia	3	$ 0.60	3	$ 0.60
United Kingdom	1	$ 0.20	1	$ 0.20
⊟ML Mountain Frame-W - Silver, 38	7	$ 133.55	7	$ 133.55
Northwest	1	$ 19.08	1	$ 19.08
Southeast	4	$ 76.31	4	$ 76.31
Southwest	1	$ 19.08	1	$ 19.08
United Kingdom	1	$ 19.08	1	$ 19.08
⊟LL Mountain Frame - Black, 40	8	$ 104.71	8	$ 104.71
Northeast	1	$ 13.09	1	$ 13.09
Northwest	2	$ 26.18	2	$ 26.18
Southeast	3	$ 39.27	3	$ 39.27
Southwest	1	$ 13.09	1	$ 13.09
United Kingdom	1	$ 13.09	1	$ 13.09
Grand Total	19	$ 239.06	19	$ 239.06

This screenshot shows the most popular item in the AWC product range in a more detailed view.

From these detailed screenshots the following conclusion can be made on **AWC Logo Cap** is the most popular product. It is sold in all the country's the AWC trades in but the profit is still negative -$6444.46. This may be because the production costs are to high and they are selling at a lower margin in order to gain market share in the country's. Compared to **LL Touring Frame – Blue, 58** the least popular product, it only trades in Australia and United Kingdom. This product generated only $0.80 cents of profit and sold a total of 4 units. This therefore shows the least popular product and how it only trades in 2 country's and low profit margins.