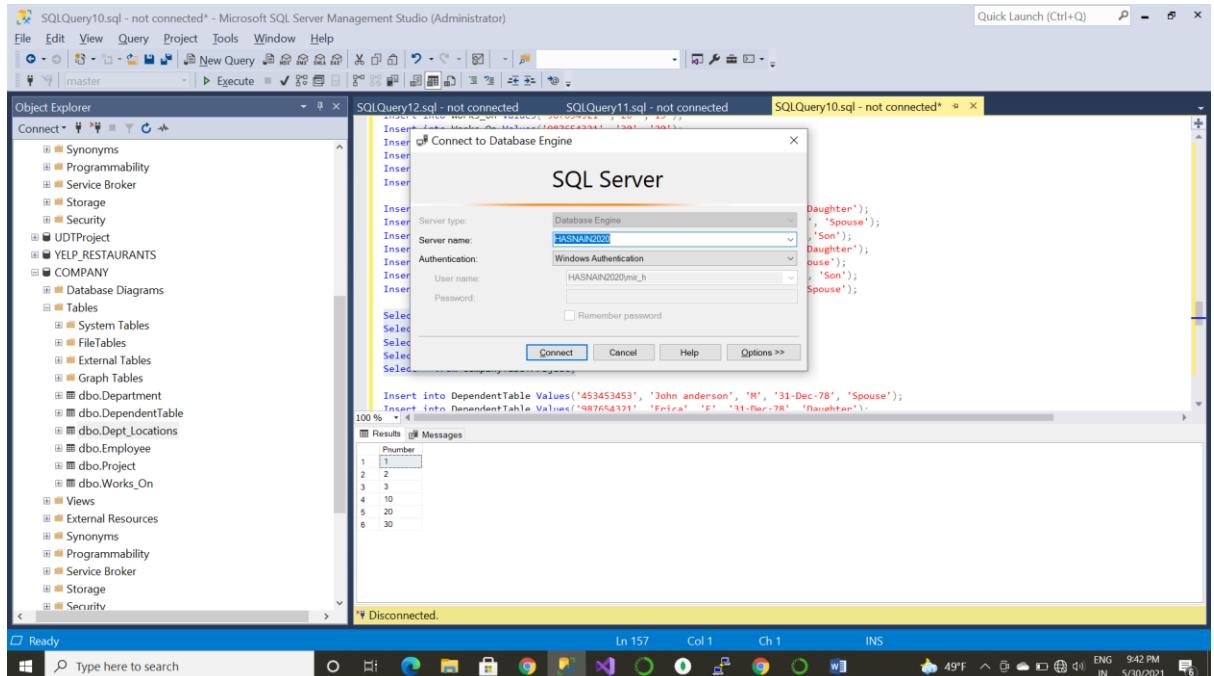


Building a data cube and MDX queries.

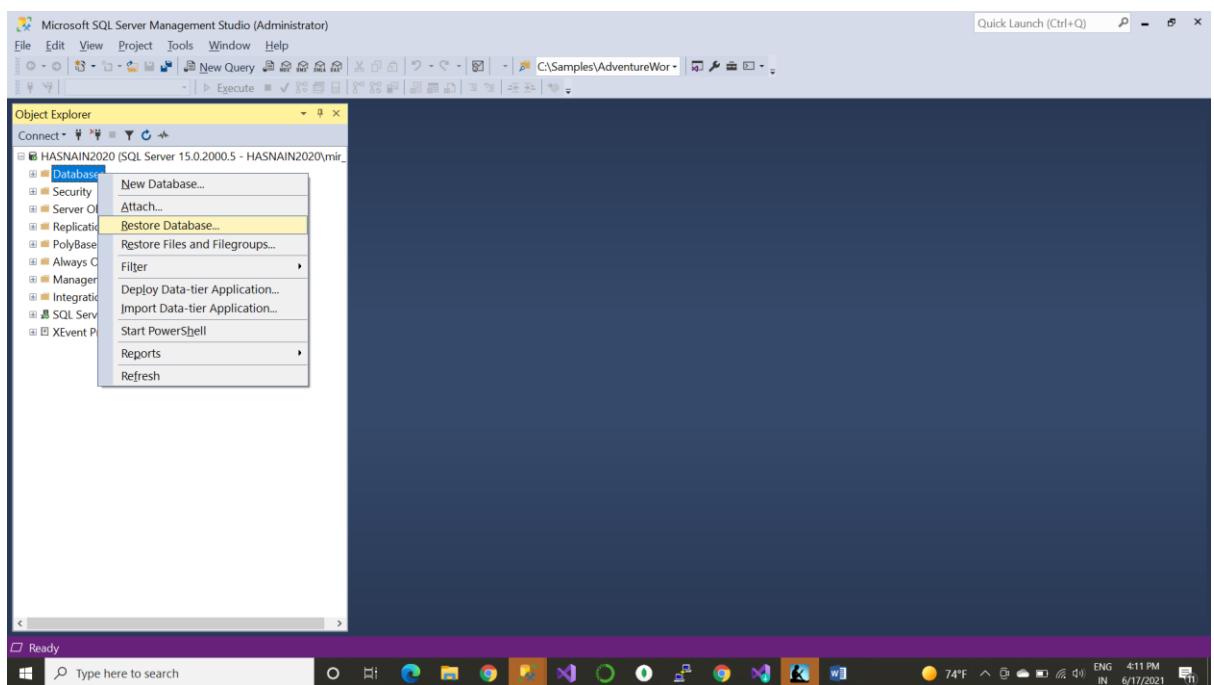
**Fathima Syeda**

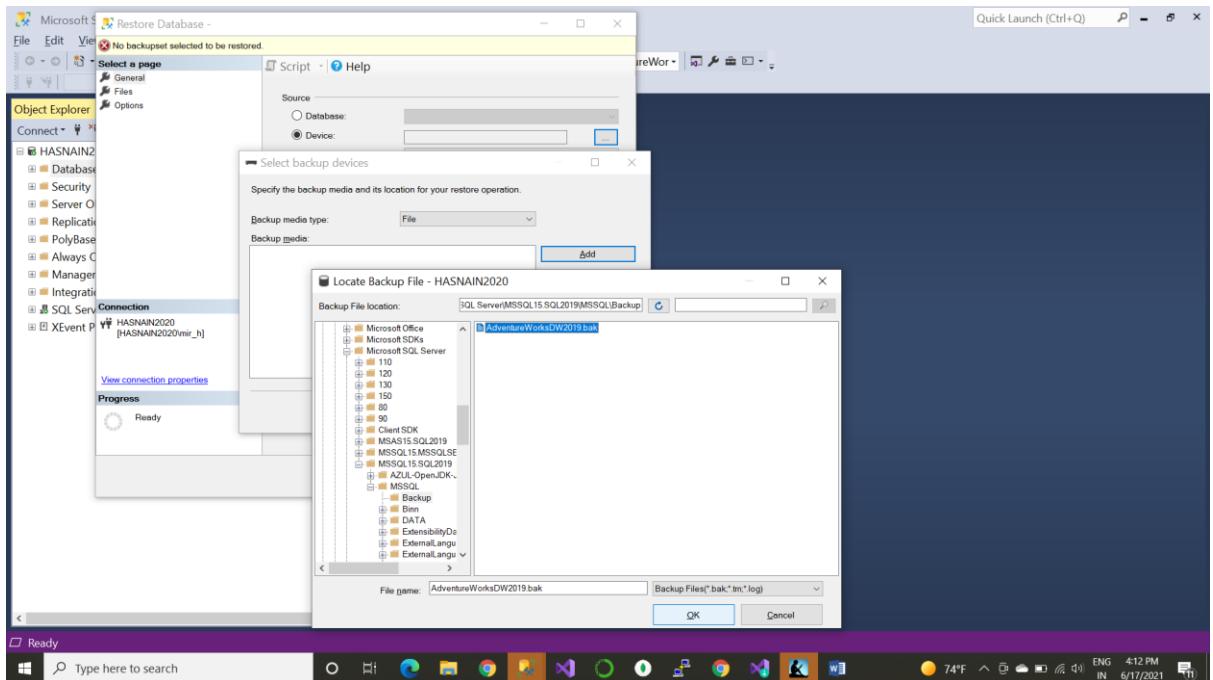
## Platform Setup:

This lab was done using Microsoft SQL Server Management Studio

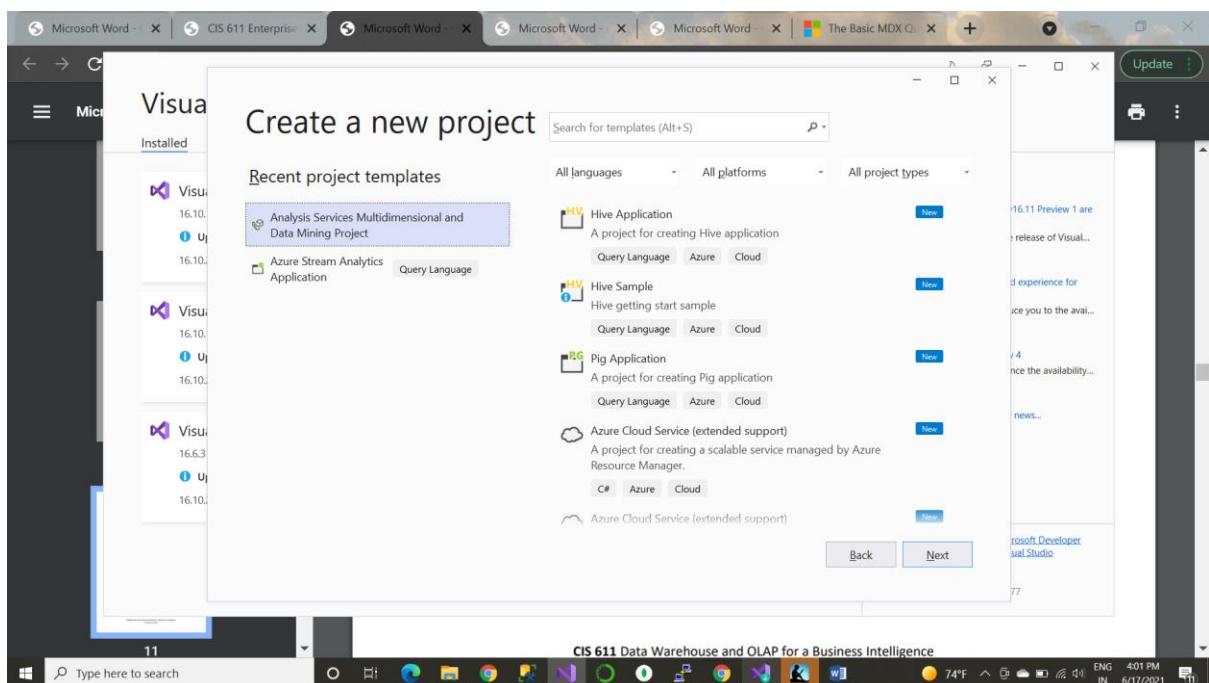


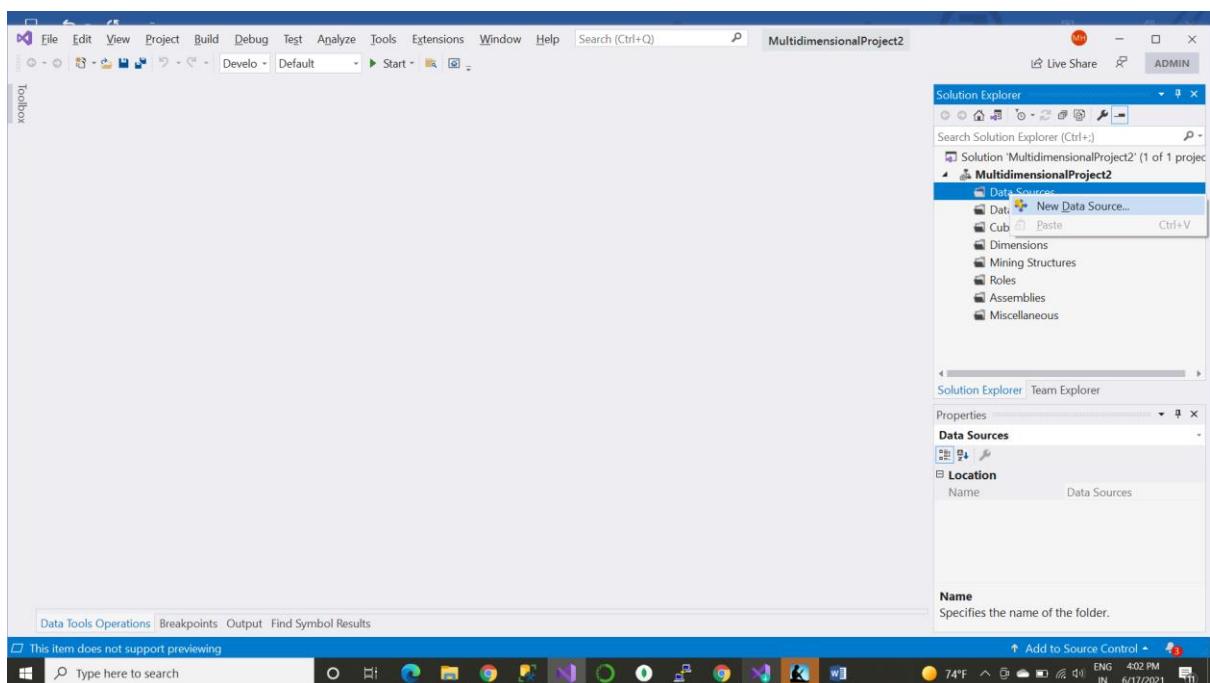
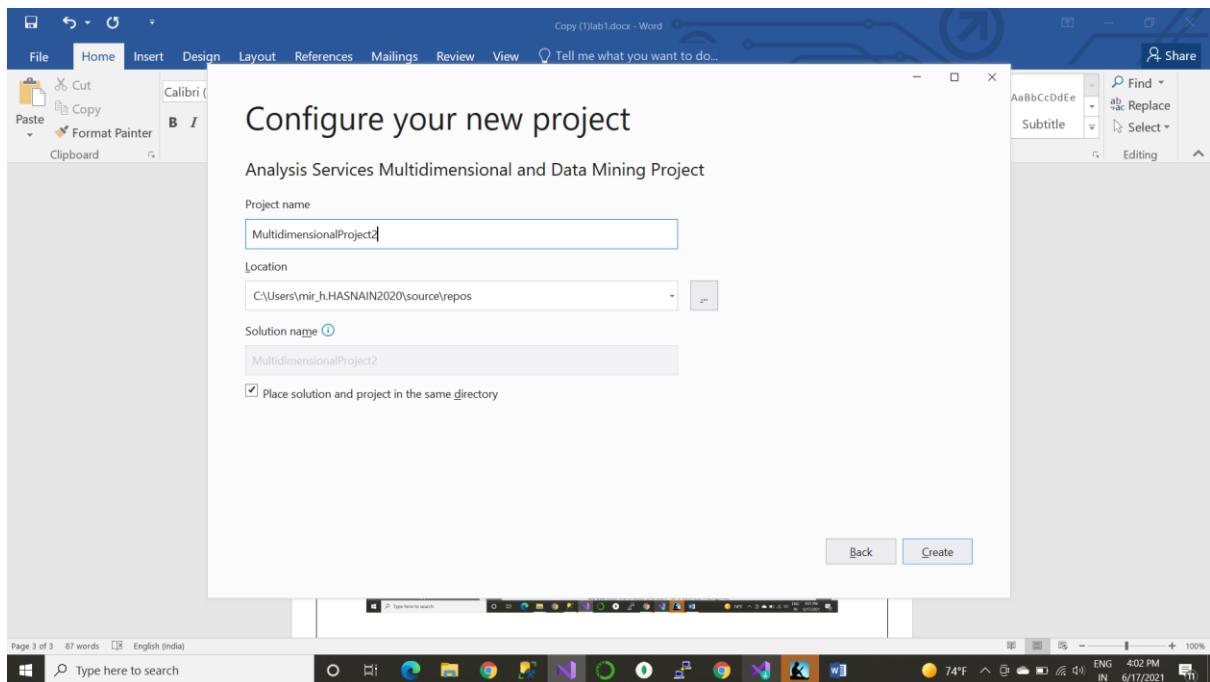
1)

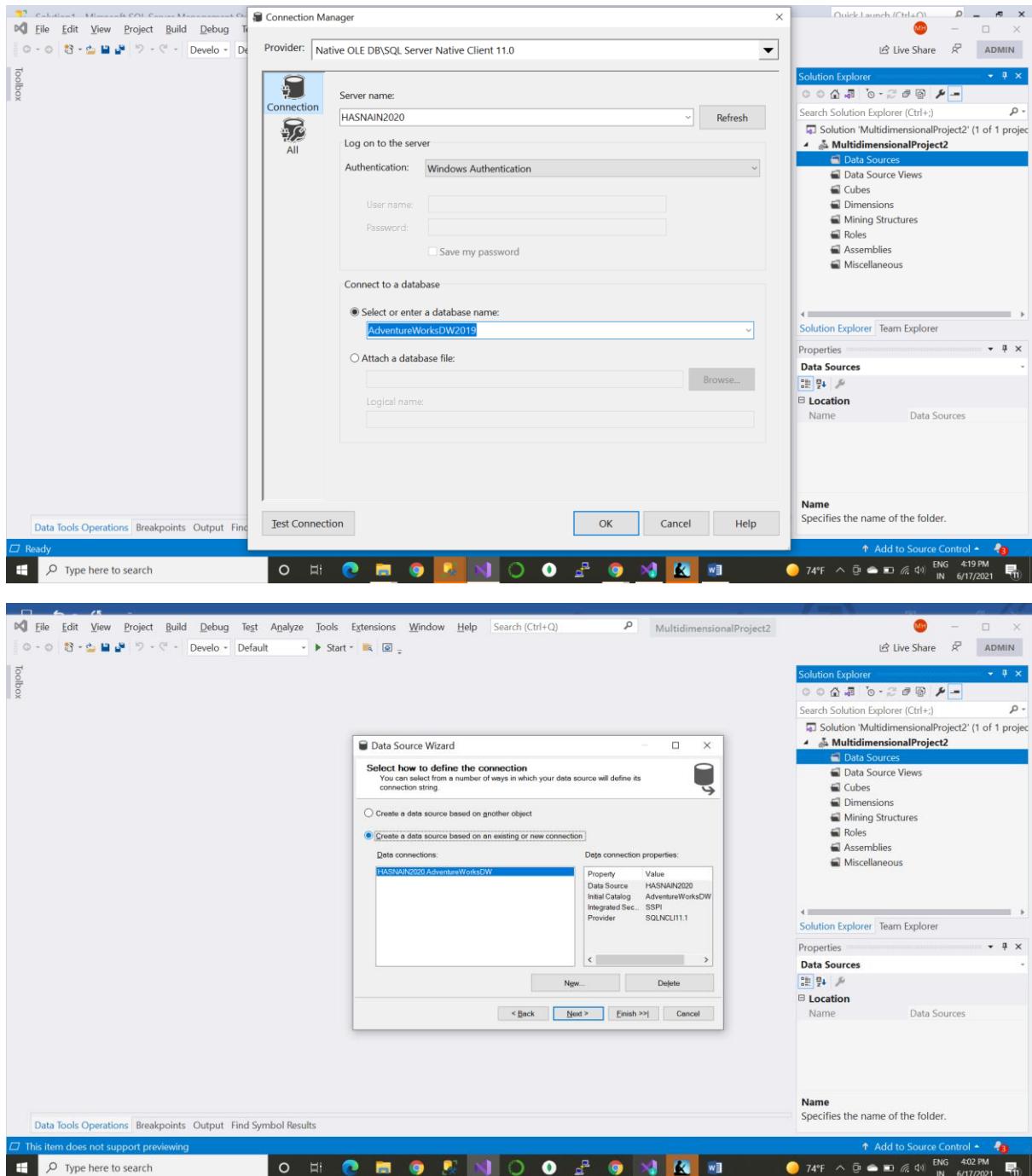


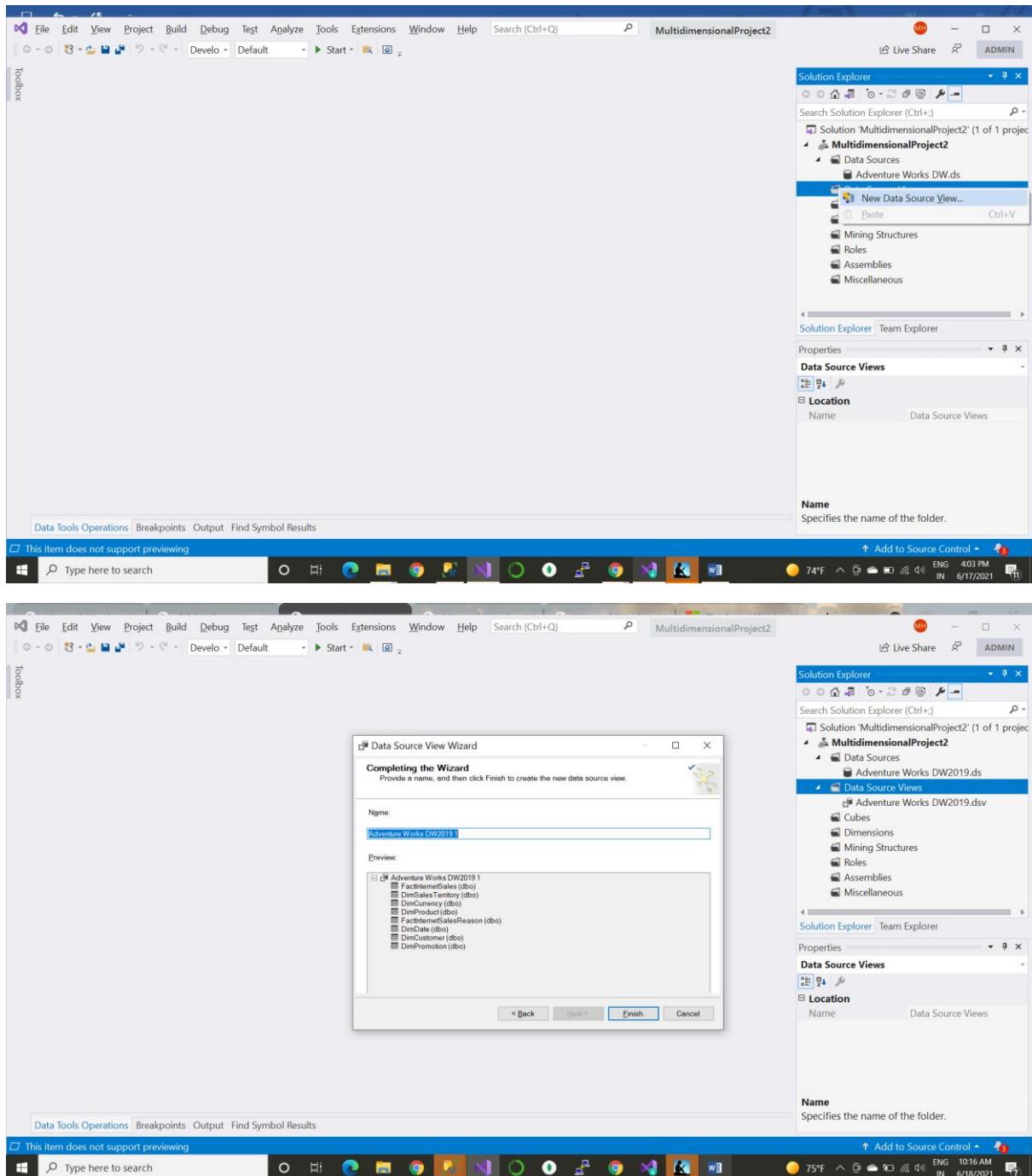


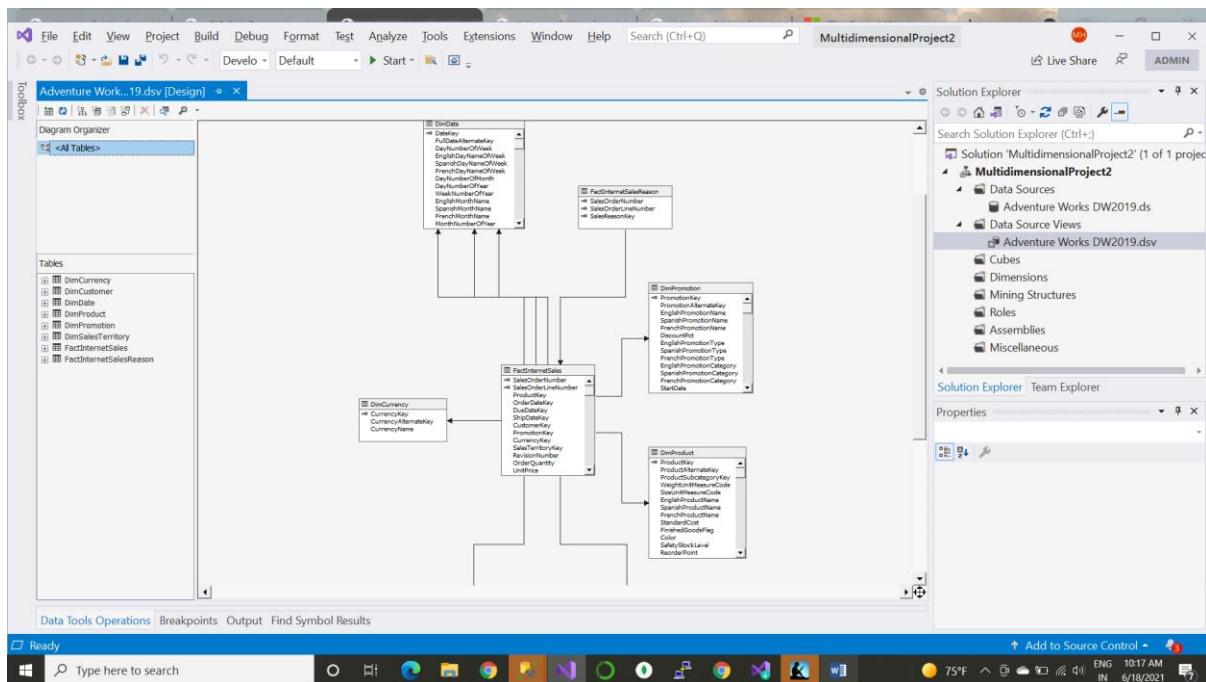
## PART-1 : Designing and Building a Multidimensional Cube in OLAP (Online Analytic Processing) Server Using Adventure Work Sample Data Warehouse for a Business Intelligence Project



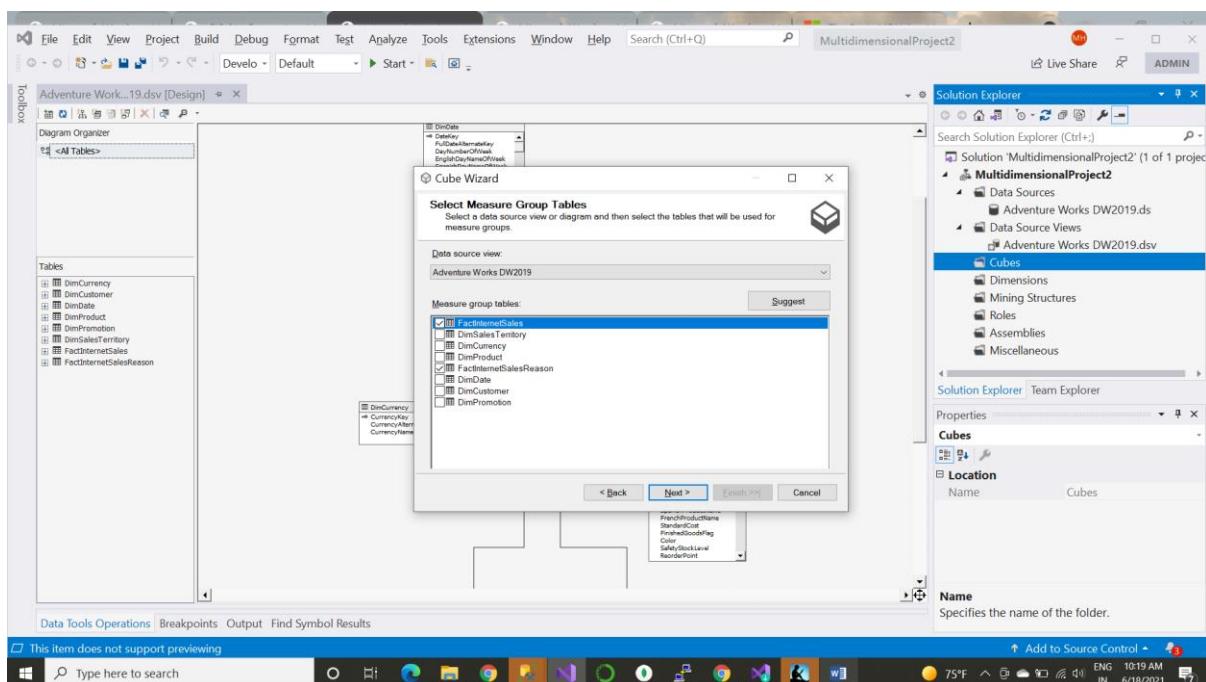


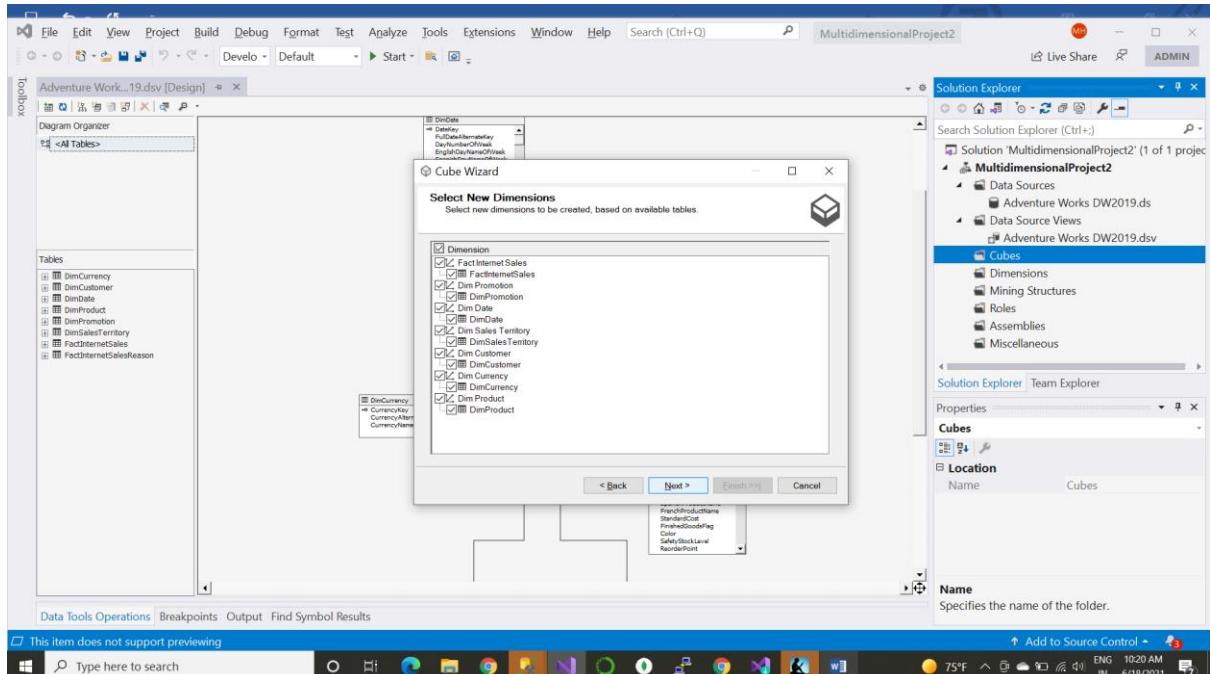
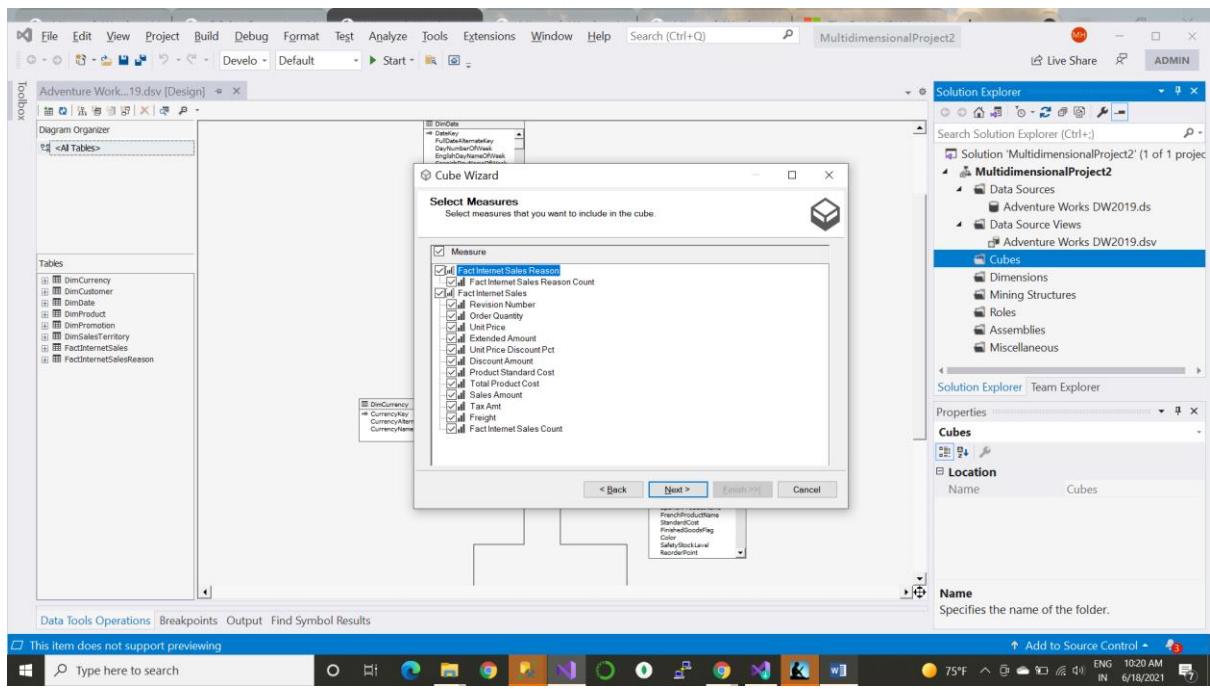


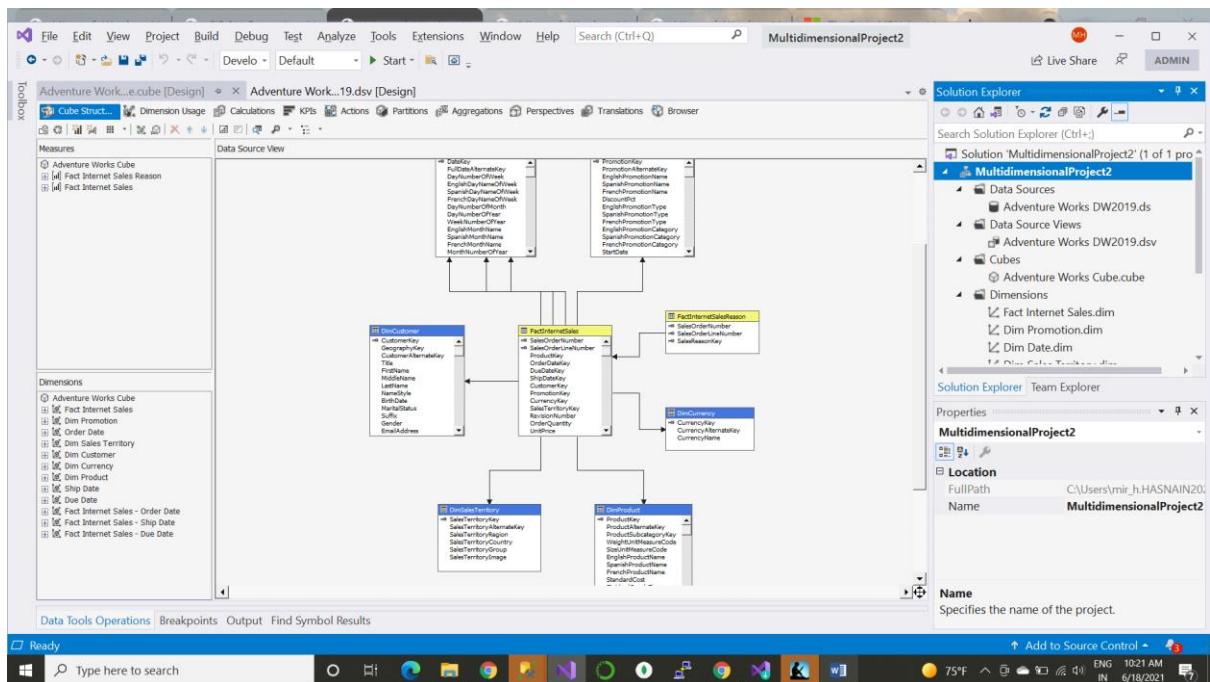




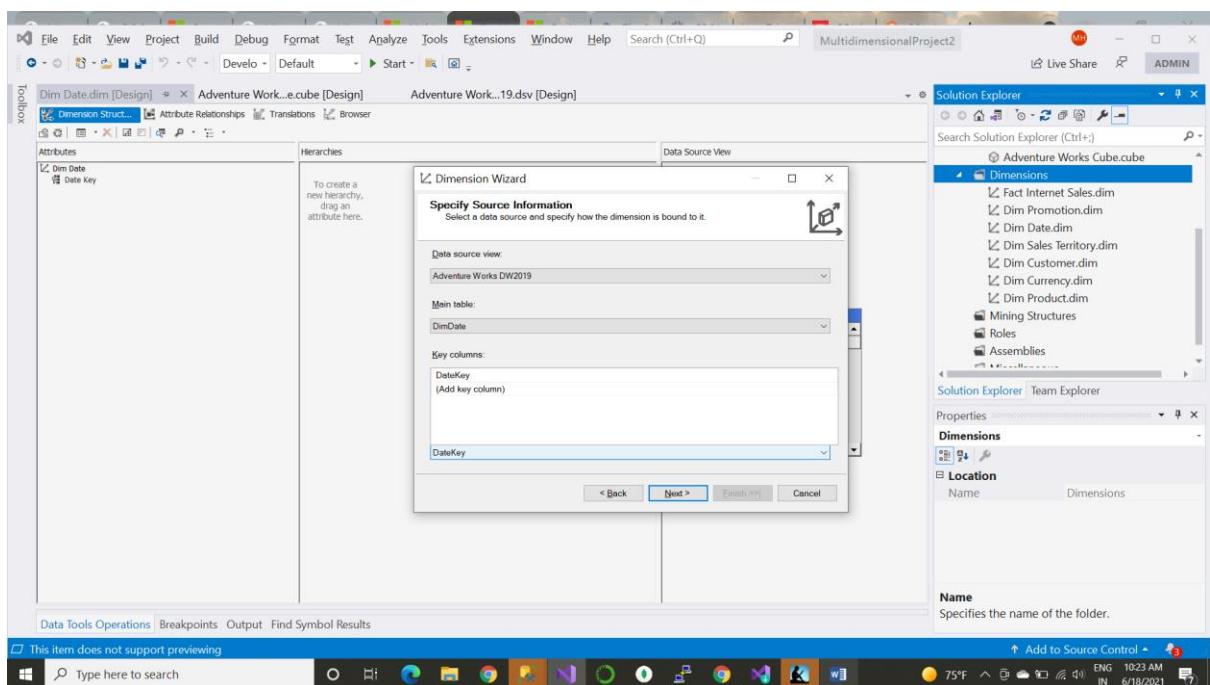
## CUBE creation

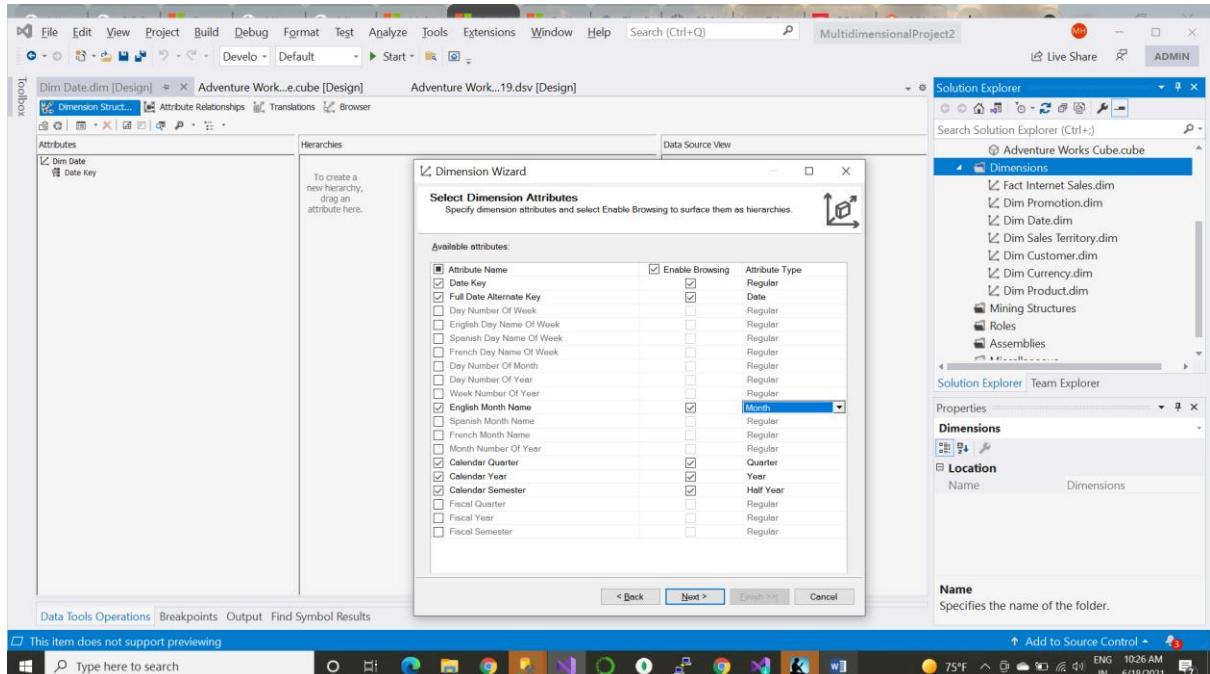
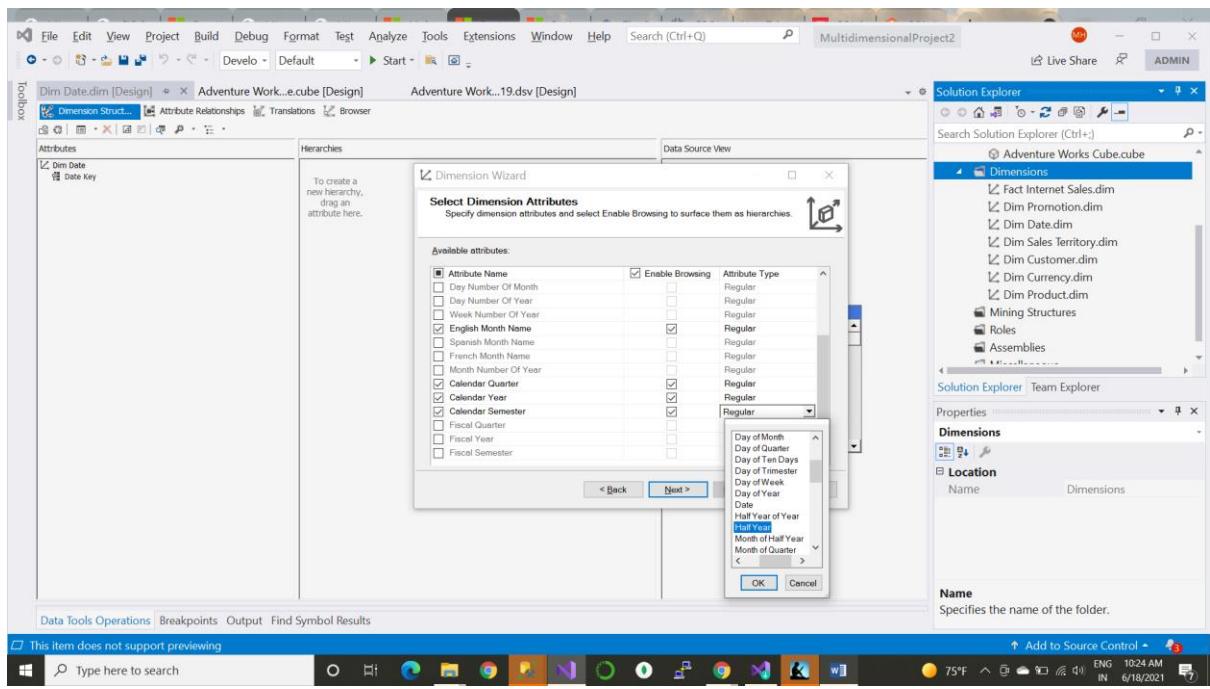


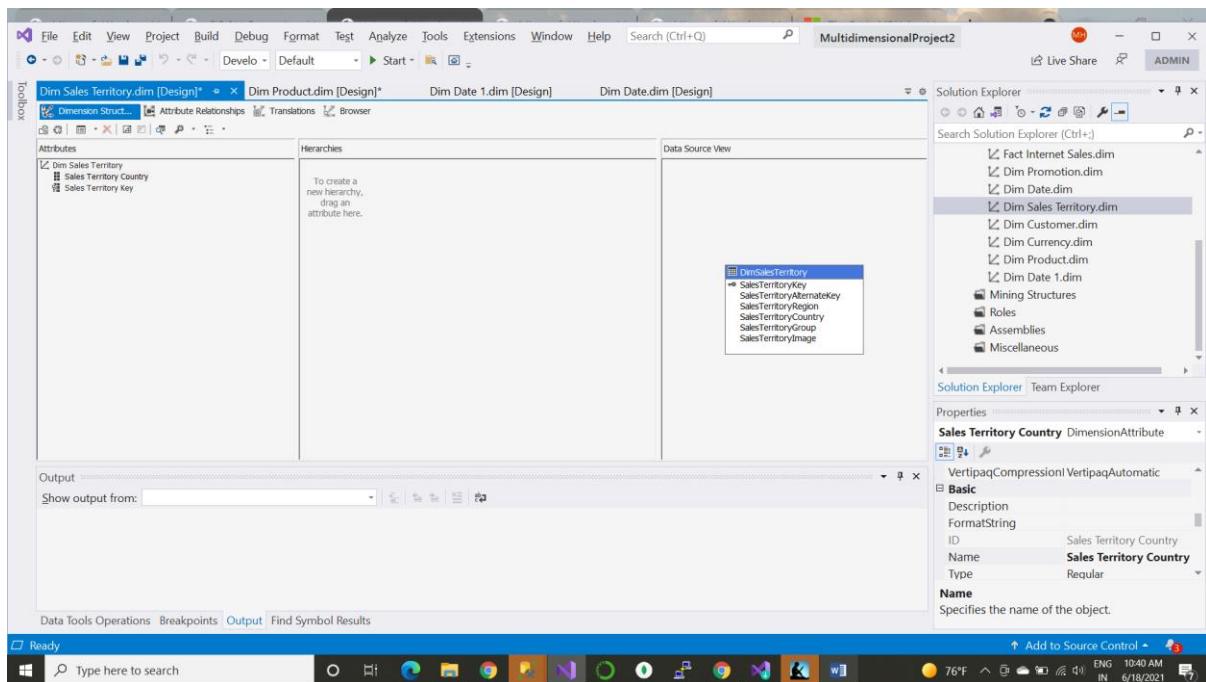




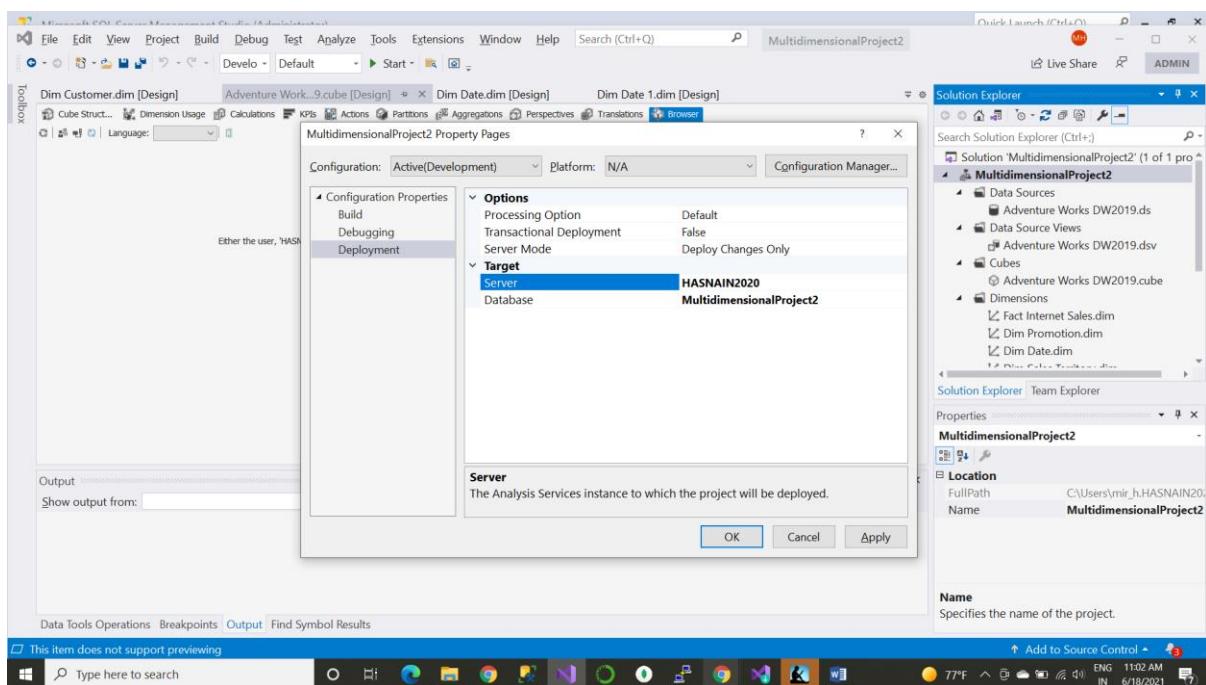
## Dimension Creation

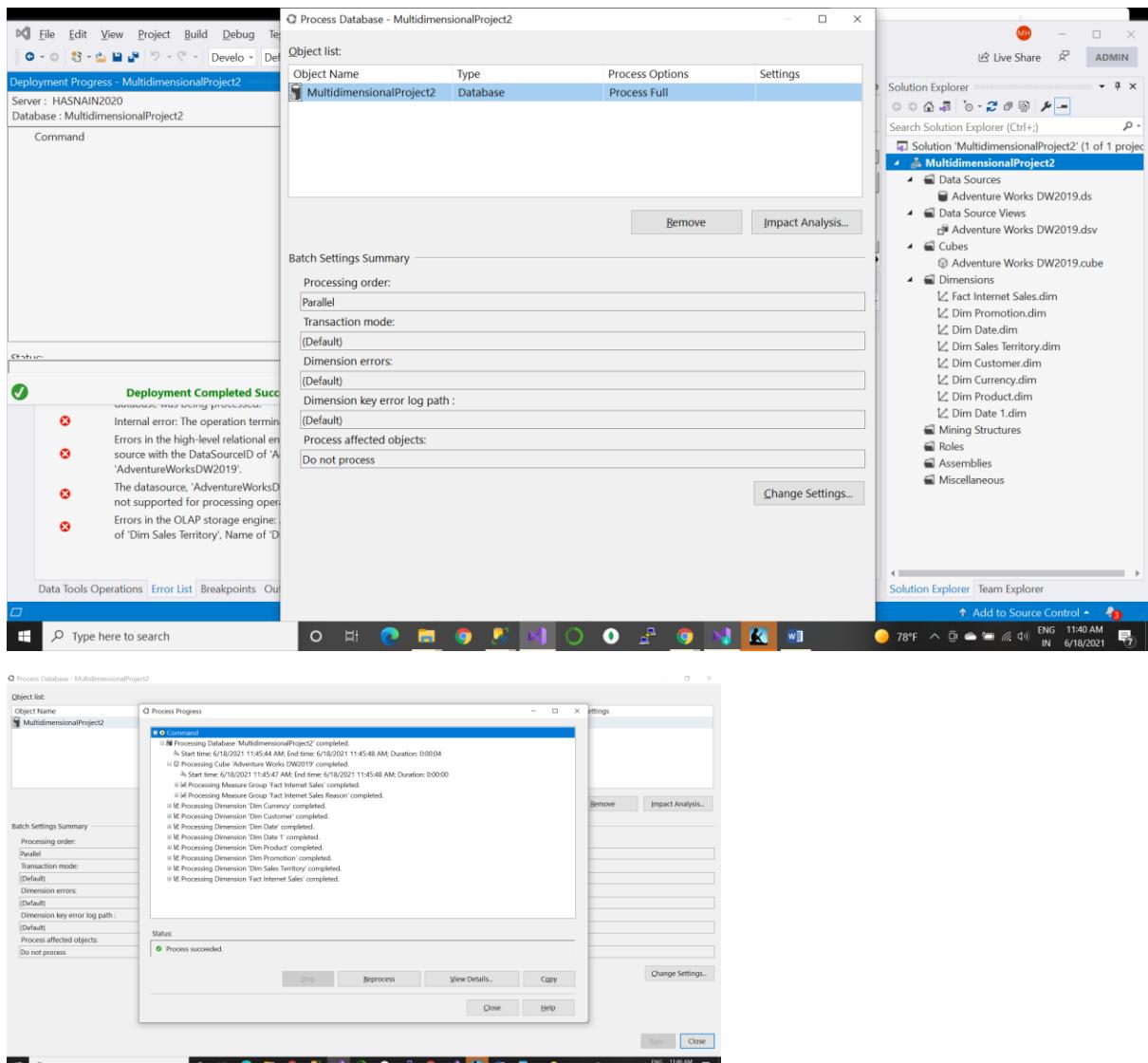






## Deployment of the cube





## Writing Queries on the deployed cube:

The screenshot shows the Microsoft SQL Server Management Studio (SSMS) interface with the 'Adventure Works DW2019 [Browse]' window open. The 'Object Explorer' on the left shows the database structure, including 'Adventure Works DW2019' and 'HASNAIN2020 (Microsoft Analysis Server 15.0.32.50 - HASNAIN2020)'. The central pane shows the 'MDX Editor' with three tabs: 'SQLQuery13.sql...020\mir.h (76)', 'SQLQuery12.sql...020\mir.h (73)', and 'SQLQuery11.sql...020\mir.h (72)'. The editor displays MDX code related to dimensions like Dim Customer, Dim Date, and Dim Product. The status bar at the bottom shows the date and time as 6/18/2021 11:51 AM.

1.

Show the cities in United States where the total sales amount is more than \$1 Million for all the products

```
SELECT [Measures].[Sales Amount - Fact Reseller Sales] on 0,
{ Filter([Reseller geography].[geographies].[City], [Measures].[Sales Amount - Fact Reseller Sales] > 1000000) } ON 1
FROM [Adventure Works DW2019]
WHERE [Reseller geography].[Country-Region].[United States]
```

The screenshot shows the SSMS interface with the following details:

- Object Explorer:** Shows the database structure, including the Adventure Works DW2019 cube.
- MDXQuery12.mdx - HASNAIN2020.MultidimensionalProject2 (HASNAIN2020\mir\_h)\* - Microsoft SQL Server Management Studio (Administrator)**: The current query window.
- Results:** The Results pane shows the output of the MDX query:

City	Sales Amount - Fact Reseller Sales
Nashua	1103370.4656
Memphis	1104968.391
Garland	1123139.9222
Seattle	1494860.5324
- Status Bar:** Shows "Query executed successfully." and the execution time "00:00:01".

2. predict the colour of each bike based in gender

```
select
nonempty( [dim customer].[gender].children) on columns,
( nonempty([dim product].[Model Name].children),
 nonempty([dim product].[color].children)
)on rows
```

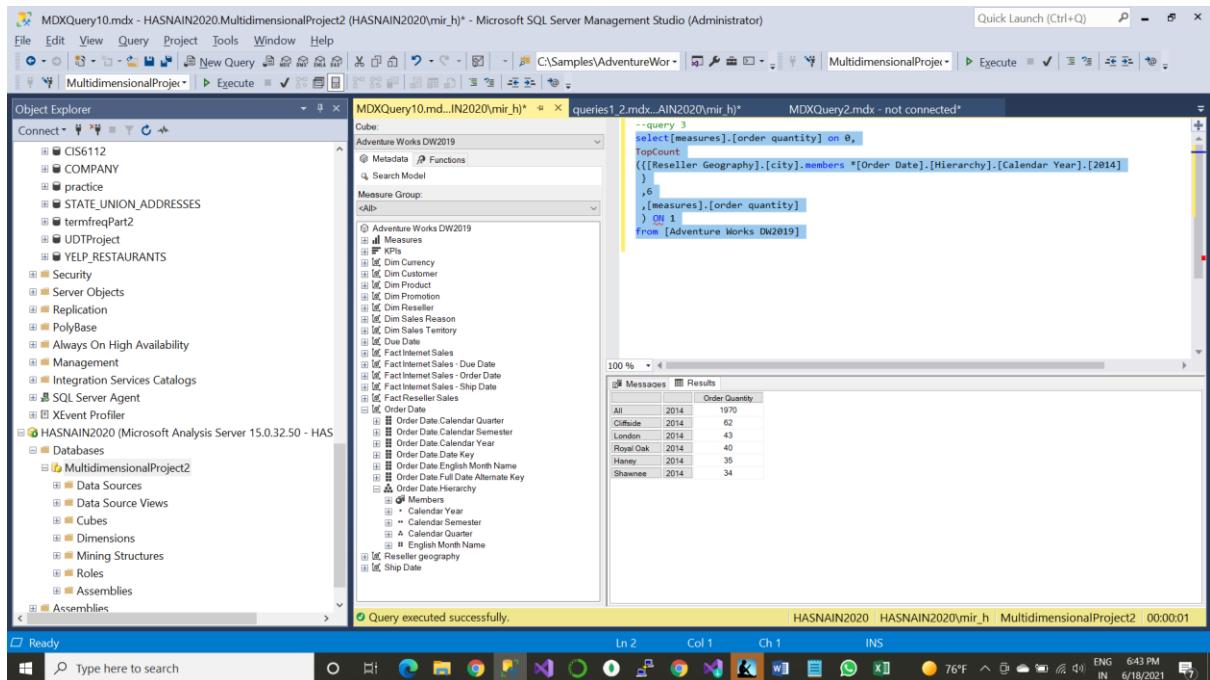
```
from [Adventure Works DW2019]
```

	F	M
All-Purpose Bike Stand	NA	140 109
Bike Wheel	NA	110 100
Bike Seat	Black	276 287
Cycling Cap	Multi	1052 1068
Fender Set - Mountain	NA	1044 1077
Half-Finger Gloves	Black	692 738
Hitch Rack - 4-Bike	NA	154 174
HL Mountain Tire	NA	694 702
HL Road Tire	NA	441 417
Handle Pack	Silver	307 365
HL Mountain Tire	NA	456 457
LL Mountain Tire	NA	526 518
Long-Sleeve Logo Jersey	Multi	878 858
ML Mountain Tire	NA	554 607
ML Road Tire	NA	461 465
Mountain Bottle Cage	NA	1004 1021
Mountain Pump Tube	NA	1027 1048
Mountain-180	Black	112 99
Mountain-190	Silver	98 90
Mountain-200	Black	913 903
Mountain-200	Silver	897 838
Mountain-450-W	Silver	286 257
Mountain-500	Black	121 131
Mountain-500	Silver	115 112
Patch Kit	NA	1575 1616
Shoeless Gloves	NA	276 293

3. Predict which cities we need more bikes supply to in next year. Decide top 5 cities that we need put more bike supply. Hint: Try to see how many bikes have been sold in a particular city at a particular time, find top 5 of those cities in the last year (last year in 2017DW is 2013). Note that 2017 DW has only up to 2014 and 2012 DW has only up to 2008 data)

```
select[measures].[order quantity] on 0,
TopCount
({{[Reseller Geography].[city].members * [Order Date].[Hierarchy].[Calendar Year].[2014]
}
,5
,[measures].[order quantity]
) ON 1
from [Adventure Works DW2019]
```

The cities that need more bike supplies are :Cliffside, London, Royal oak, Hayney and Shawnee



4. Drill down more in last year (last year in 2017 DW is 2013) to see the purchase of bikes in each quarter and each month respectively in different cities then find out any unusual sales trend we should know about to prepare for the next year.

```
SELECT
Non Empty Order
([Reseller geography].[geographies].[City], [Measures].[Order Quantity - Fact Reseller Sales], BDESC )on 1,
( [Measures].[Order Quantity - Fact Reseller Sales],
DrilldownMember
(
[Order Date].[Hierarchy].[Calendar Quarter].Members,
{ [Order Date].[Hierarchy].[Calendar Quarter], [Order Date].[Hierarchy].[English Month Name] }
)
) on 0
FROM [Adventure Works DW2019]
WHERE ( [order date].[calendar year].[2013], [Dim Product].[Category].Bikes
```

MDXQuery10.mdx - HASNAIN2020.MultidimensionalProject2 (HASNAIN2020\mir\_h)\* - Microsoft SQL Server Management Studio (Administrator)

```
--query 3
select {[measures].[order quantity]} on 0,
TopCount
({{[Reseller Geography].[city].members * [Order Date].[Hierarchy].[Calendar Year].[2014]}}
),
6
,[measures].[order quantity]
) ON 1
from [Adventure Works DW2019]
```

```
--query 4
select {[order date].[calendar quarter].members}on columns,
Filter({[Reseller Geography].[city].members,
[order date].[calendar year].[2013]}) on rows
from [Adventure Works DW2019]
where {[measures].[sales amount]}
```

	All	1	2	3	4
Ballard	45308.9957	12886.07	8970.399999999999	9728.125699999999	13724.4
Basingate Hants	3271.6782	735.2682	(null)	2538.31	(null)
Bayton	25.48	(null)	(null)	25.48	(null)
Bawerton	161959.427	44302.84069999999	31997.63850000000	40168.76780000001	45490.19
Bell Gardens	5920.45	(null)	(null)	2341.97	3578.27
Bellflower	30229.8957	53275.39999999999	75000.39999999999	68402.76000000001	10057.0352
Bentham	207913.2533	31073.35850000001	49561.152	62111.17456000000	83012.26000000000
Berding	314568.7193	67786.4042	71408.5973	72301.7224	9703.99540000002
Berkley	258138.4605	50664.55069999999	66535.06029999999	44555.9432	96082.9063000001
Berks	46935.107	6503.78	21181.9278	3721.3896	14891.0096
Berkshire	58119.8532	9321.6357	8789.7	15923.2725	24079.255
Berlin	269030.6271	37891.6171	69765.67309999999	71084.7852	82188.5517
Beverly Hills	202696.9643	36115.2221	50097.8078	51189.33999999999	65294.0456999998
Biloxi	84337.0892000001	22829.5857	28287.6782	14016.9757	18659.8496
Billing	92.08	(null)	92.05	(null)	(null)

Query executed successfully.

MDXQuery12.mdx - HASNAIN2020.MultidimensionalProject2 (HASNAIN2020\mir\_h)\* - Microsoft SQL Server Management Studio (Administrator)

```
{ filter({[Reseller Geography].[City].[Measures].[Sales Amount - Fact Reseller Sales] > 1000000}) ON 1
FROM [Adventure Works DW2019]
WHERE [dim Reseller].Country.[United States]
```

```
SELECT
Non Empty Order
({[Reseller geography].[geographies].[City].[Measures].[Order Quantity - Fact Reseller Sales], BDESC} ON 1,
 {[Measures].[Order Quantity - Fact Reseller Sales]},
DrilldownMember
(
[Order Date].[Hierarchy].[Calendar Quarter].Members,
{[Order Date].[Hierarchy].[Calendar Quarter], [Order Date].[Hierarchy].[English Month Name] }
)
) ON 0
FROM [Adventure Works DW2019]
WHERE ([order date].[calendar year].[2013], [Dim Product].[Model Name])
```

	Order Quantity - Fact Reseller Sales				
	January	March	May	April	June
Toronto	809	212	1413	574	120
London	347	241	739	243	143
Paris	640	183	611	504	106
Burnaby	377	(null)	521	279	(null)
Montreal	72	34	534	35	21
Orleans	476	(null)	447	342	(null)
Richmond	1	112	151	60	60
Edmonton	211	242	339	131	200
Reno	484	(null)	368	368	(null)
Seattle	290	165	316	186	130
Inning	(null)	(null)	330	(null)	(null)
Loveland	389	(null)	346	346	(null)
Saint Ouen	(null)	(null)	296	(null)	(null)
Union City	(null)	(null)	261	(null)	(null)
Miami	93	290	278	64	206

Query executed successfully.