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Department of Languages

BSc in Applied Data Science Communication

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SQL for data science- (LB 1224)

Assignment 2

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DASHBOARD DESIGN REPORT

Task01 - Great Manchester Property Sales

Group-03

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TASK 01

Introduction

An ambitious project called the Greater Manchester Property Price Monitor is being carried out by our respected customer, a renowned research firm located in Greater Manchester, UK. Our job as the data analyst assigned to this project is to develop, construct, and test a complete solution that makes use of Power BI visualization technologies in addition to SQL database administration.

The goal is to provide an affordable, user-friendly reporting tool that can analyze the dynamic Greater Manchester real estate market. We will describe the proposed architecture and implementation of the SQL database, together with the tables, views, and stored procedures required to support the Greater Manchester Price Paid Dataset, in the parts that follow in this report. Furthermore, we'll direct the development of a Power BI dashboard that not only shows data in an eye-catching way but also enables users to assess and comprehend the nuances of the neighbourhood real estate market.

Geospatial analysis, price distribution, sales volume, and sales trend analysis are some of the important elements of the Power BI Dashboard that provide unique insights into the real estate industry. Exquisite and imaginative visualizations will be used to improve the user experience, guaranteeing that the conclusions drawn from the data are understandable and useful. This all-inclusive solution will include a complete database backup as well as extensive T-SQL statements with the necessary comments for the database setup. To provide a smooth comprehension of the analytical process, the Power BI Dashboard will be supported with functional T-SQL queries, screenshots, and a comprehensive description of each visual aspect.

The report's final parts will cover the methods used for the study, emphasize the most important conclusions drawn from the data, and examine the limits and consequences of the results. In addition to meeting the needs of the customer in full, this assignment aims to provide insightful and useful information to researchers, policymakers, and industry players that are active in the Greater Manchester real estate market.

Exploration of Data Set

Review of Data set

The study's methodology, the key findings derived from the data, and the limitations and implications of the findings will all be covered in the report's concluding sections. This project is to satisfy the demands of the client in full while also offering researchers, decision-makers, and industry participants involved in the Greater Manchester real estate market valuable and practical information.

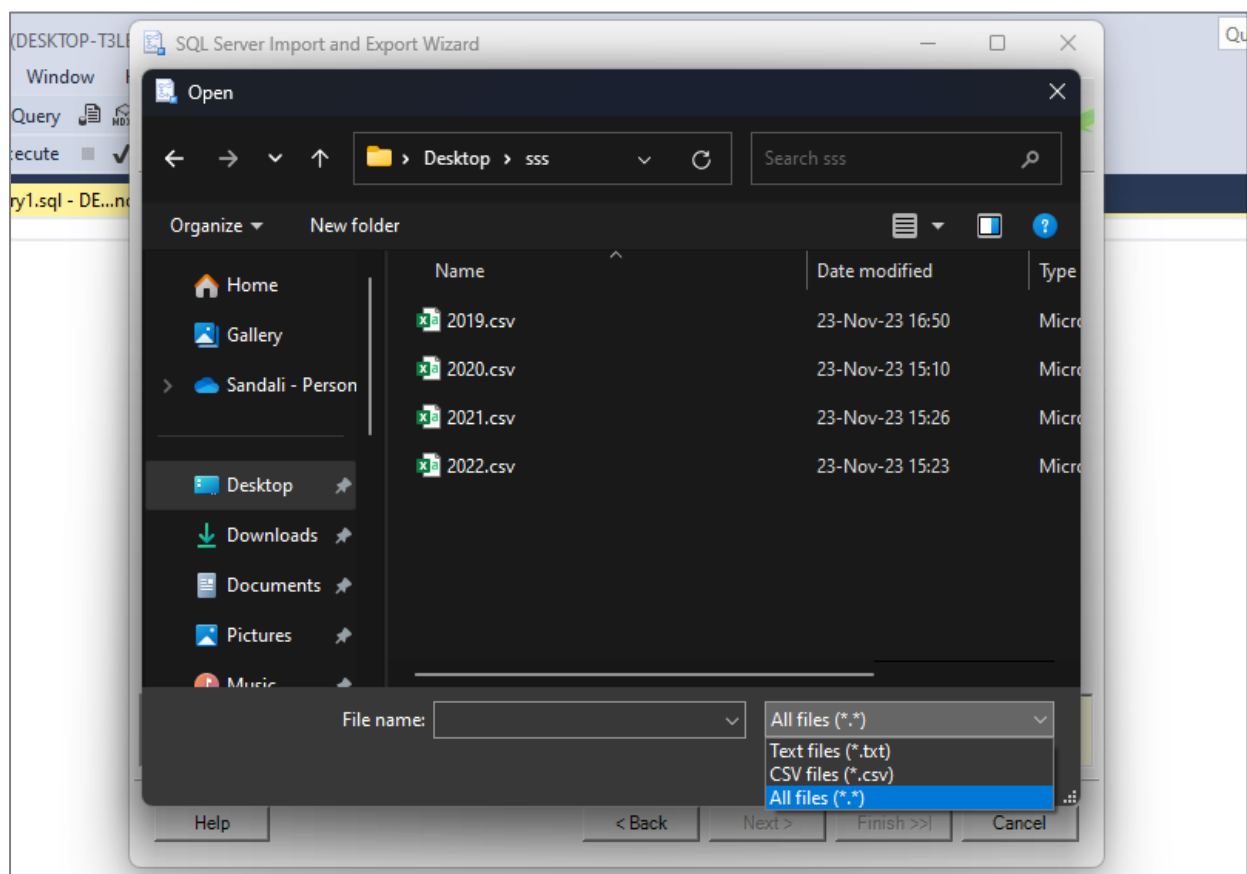
Below is a description of them.

1. Transaction ID - A reference number which is generated automatically recording each published sale. The number is unique and will change each time a sale is recorded.
2. Sales Price - The sale price is stated on the transfer deed.
3. Date of Transfer - Date when the sale was completed, as stated on the transfer deed.
4. Postcode - This is the postcode used at the time of the original transaction. Note that postcodes can be reallocated, and these changes are not reflected in the Price Paid Dataset.
5. Property Type (D = Detached, S = Semi-Detached, T = Terraced, F = Flats/Maisonettes, O = Other)
6. Old/New - Indicates the age of the property and applies to all price-paid transactions, residential and non-residential. (Y = a newly built property, N = an established residential building)
7. Duration – Relates to the tenure. (F = Freehold, L= Leasehold etc.)
8. PAON (Primary Addressable Object Name) - Typically, the house number or name.
9. SAON (Secondary Addressable Object Name) - Where a property has been divided into separate units (for example, flats), the PAON (above) will identify the building and a SAON will be specified that identifies the separate unit/flat.
10. Street
11. Locality
12. Town/City
13. District

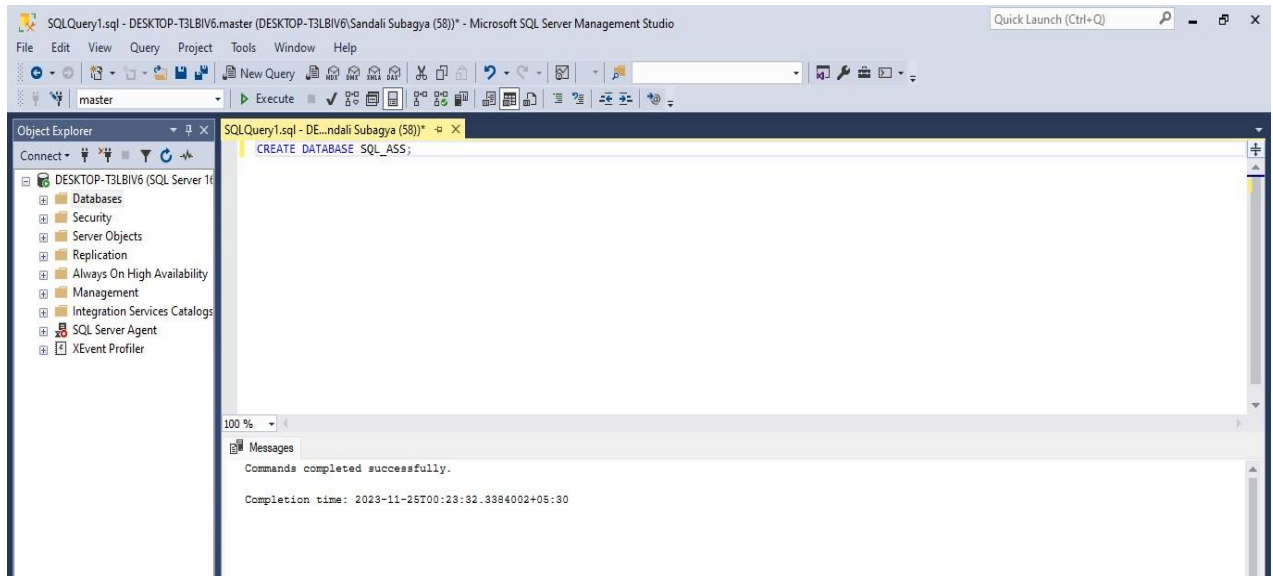
14. County
15. Type of Price Paid - Indicates the type of Price Paid transaction. (A = Additional Price paid entry includes single residential property sold for value, B = Additional Price paid entry including transfers under power of sale)
16. Record Status - Indicates additions, changes, and deletions to the records. (A = Addition, C = Change, D = Delete)

Importing data set to SQL Server

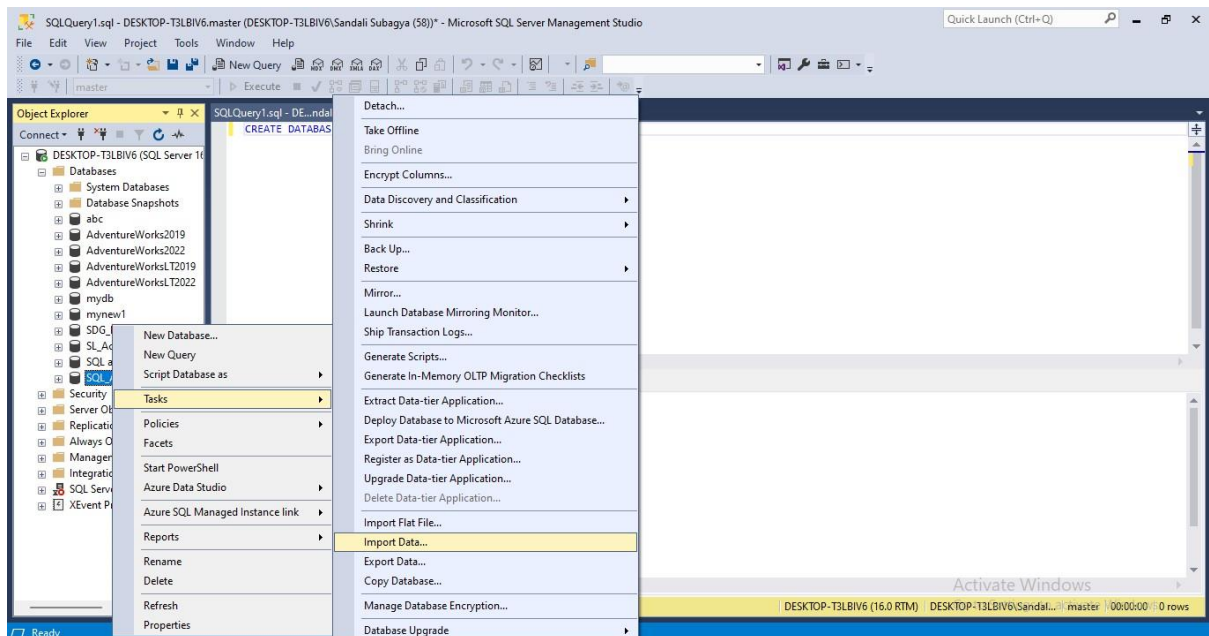
Download the four files from this link <https://www.gov.uk/government/statistical-data-sets/price-paid-data-downloads> (2019,2020,2021,2022) move those four files to the folder. Create a database called 'Assignment' in the SQL server by using the following code.



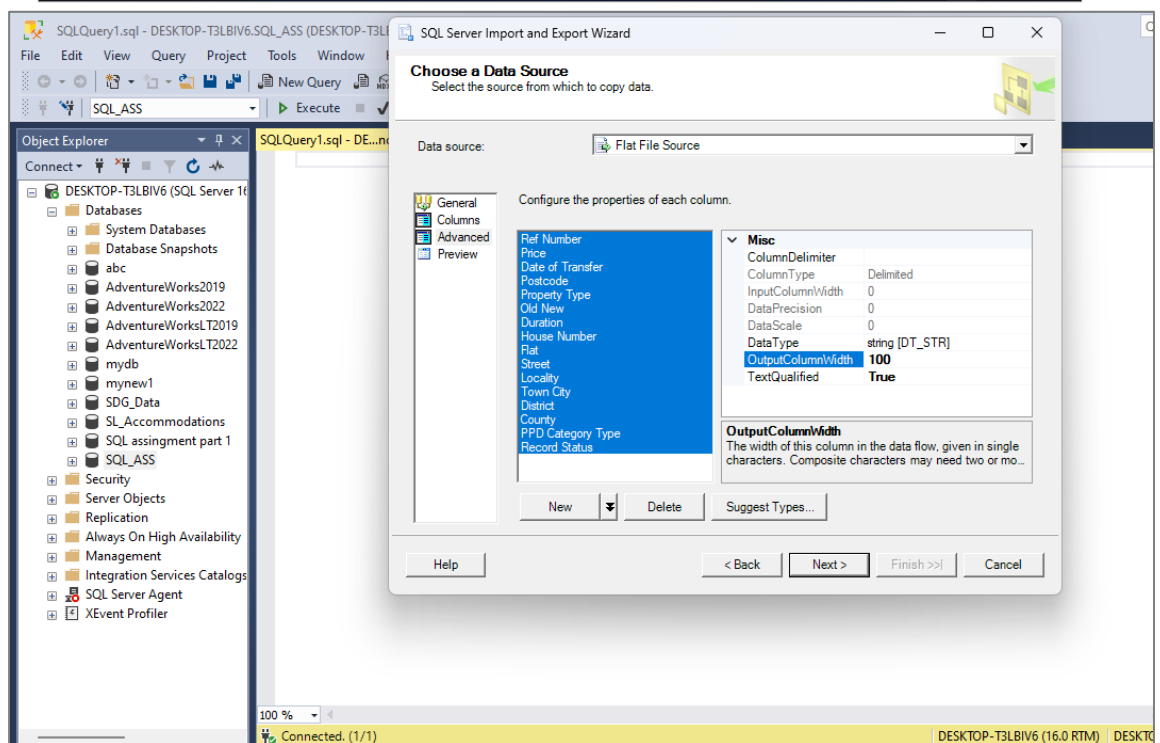
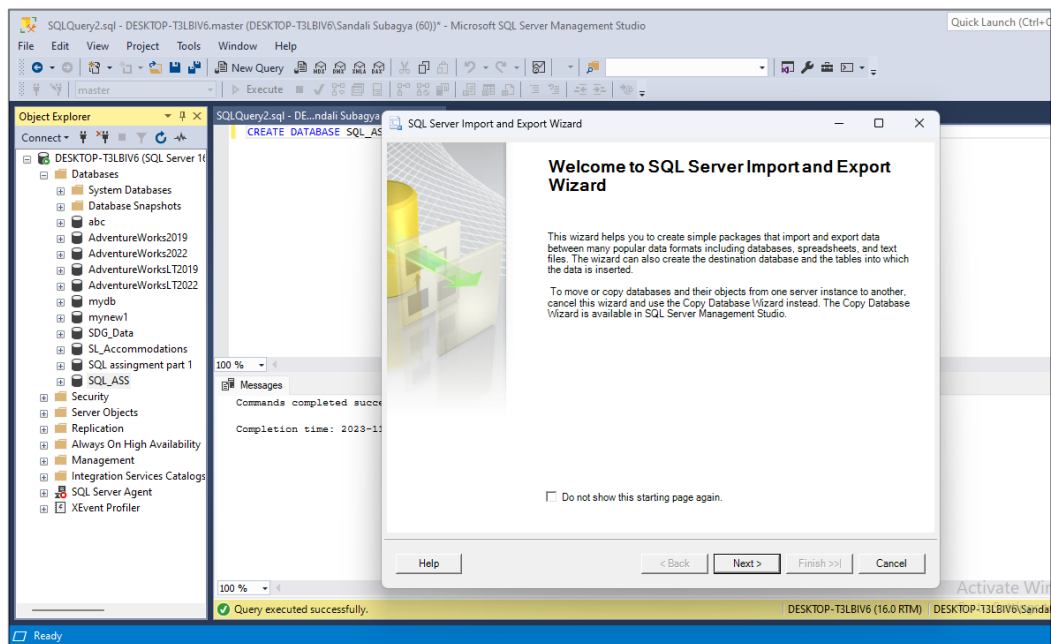
- Create the database



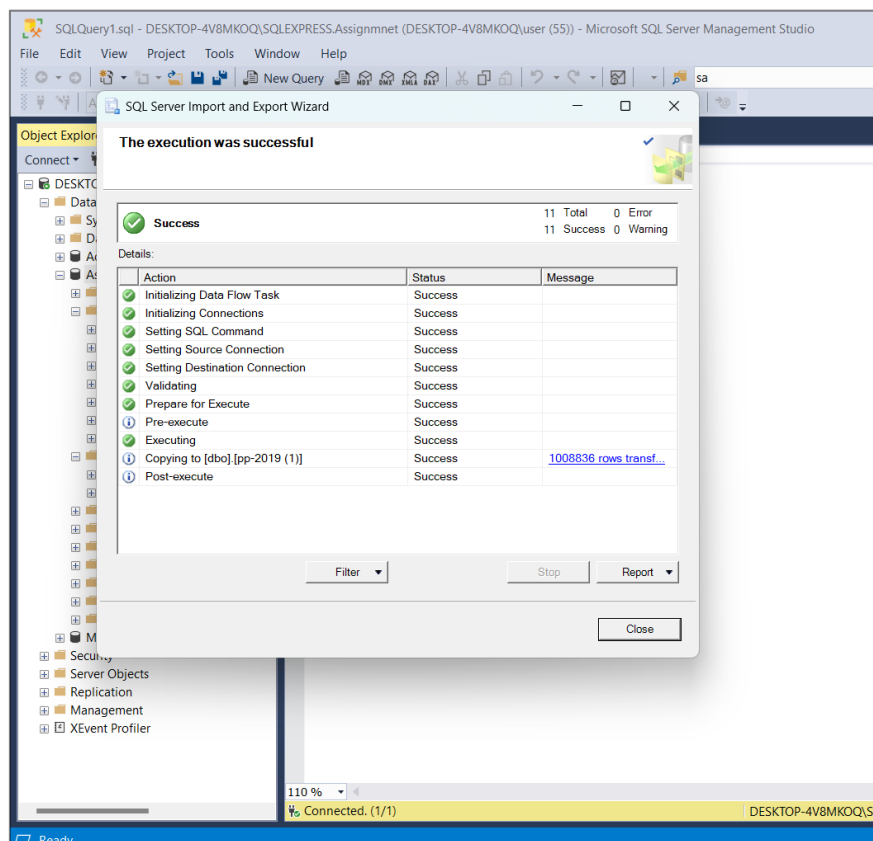
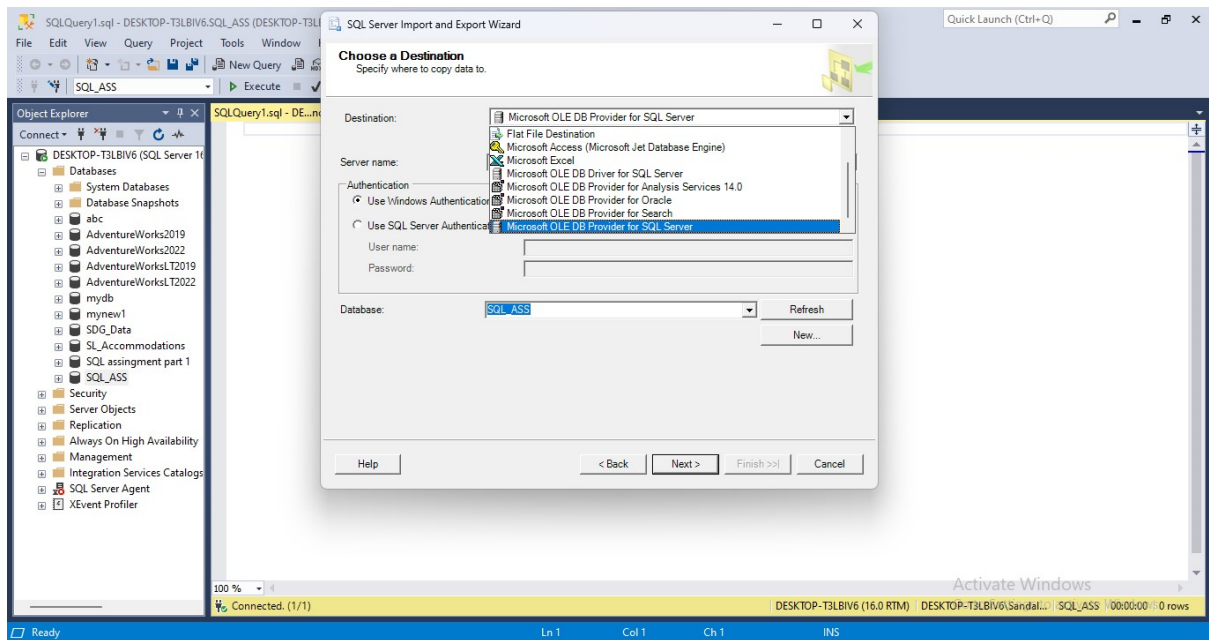
- Import four data sets to the created database by using the import data function.



- Click Next on the SQL Server Import and Export Wizard welcome page.
- Select Flat File Source as the data Source and enter or browse for the file to import



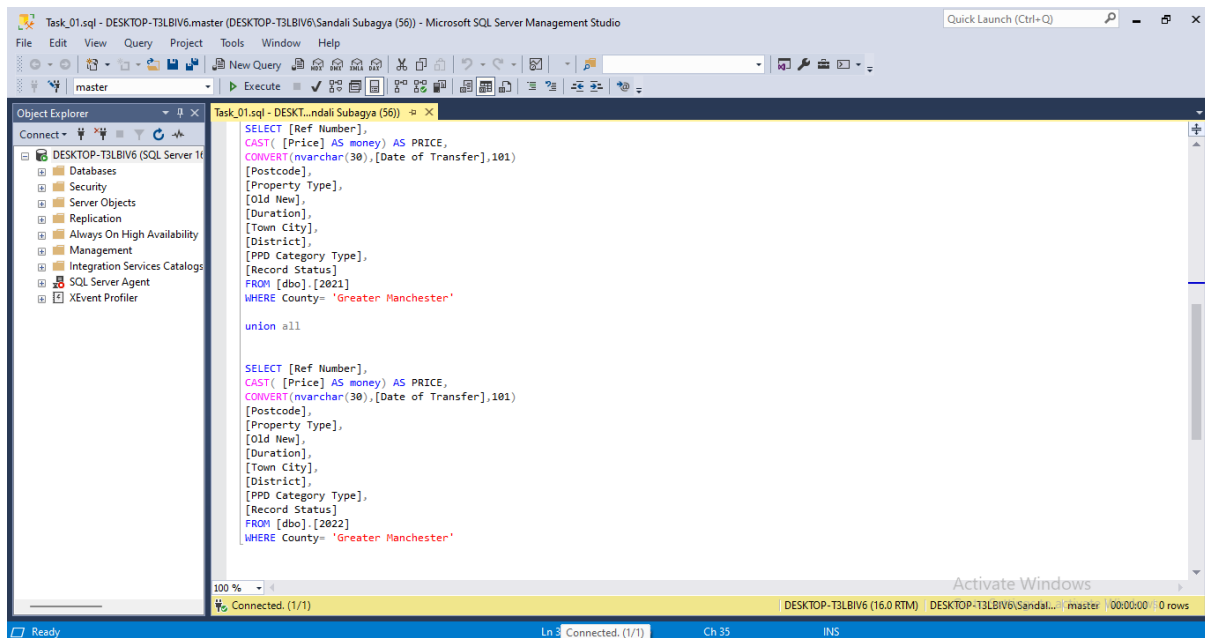
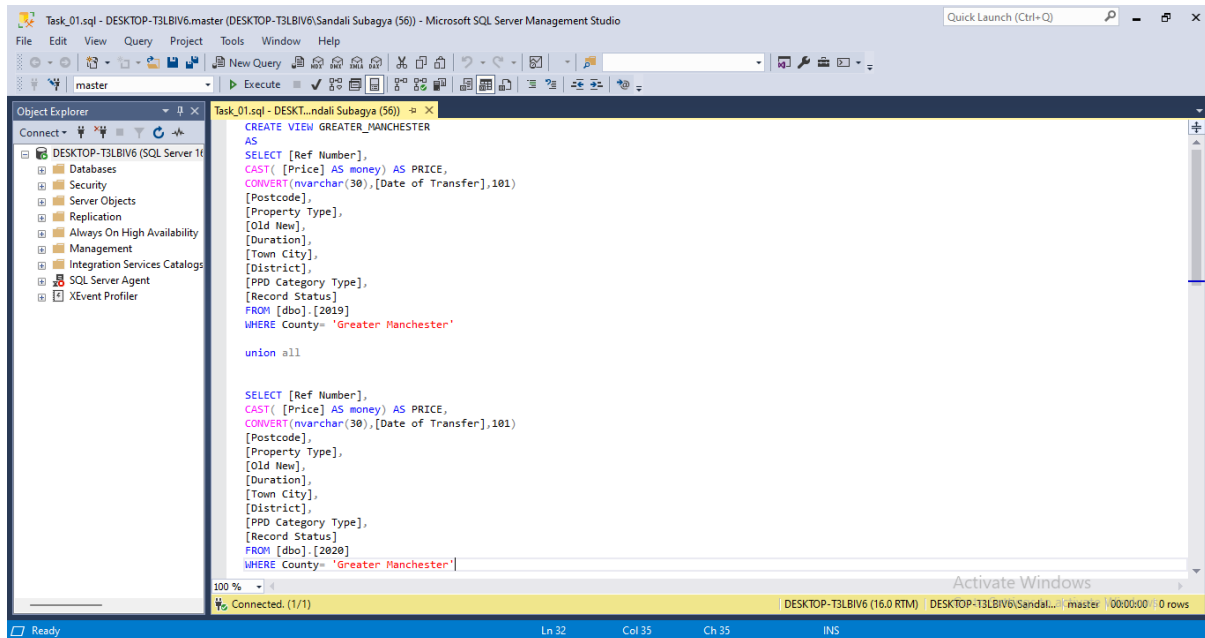
- Click Next to move forward make changes if necessary.
- Click Next and Accept the default.
- Click Finish



- If all the data has loaded, click close.

Create View table.

These are the SQL queries wrote in order to create tables and pivot tables for creating database.



View Created as follows.

SQLQuery1.sql - DESKTOP-4V8MKOQ\SQLEXPRESS.Assignmnt (DESKTOP-4V8MKOQ\user (65)) Executing... - Microsoft SQL Server Management Studio

Object Explorer: DESKTOP-4V8MKOQ\SQLEXPRESS (S) > Databases > System Databases > AdventureWorksLT2019 > Assignmnt

Results: 100% | Messages

Ref Number	Price	Date of Transfer	Postcode	Property Type	Old New	Duration	House Number	Flat	Street	Locality
SCAC1318-BEEC-0253-E053-6B04A8C08E51	550000	5/24/2019 0:00	SW4 0BD	F	N	L	ASCOT HOUSE	65	FLAT 5	VENN ST
SCAC1318-BEEC-0253-E053-6B04A8C08E51	628000	6/19/2019 0:00	SW18 5AN	T	N	L	9	NULL	ASTONVILLE STREET	NULL
SCAC1318-BEEF-0253-E053-6B04A8C08E51	525000	3/28/2019 0:00	SW18 4HU	F	N	L	2	APARTMENT 26	HARDWICKS SQUARE	WANDSW
SCAC1318-BEEF-0253-E053-6B04A8C08E51	425000	4/29/2019 0:00	SE10 8JP	F	N	L	15	FLAT 20	TARVER WAY	GREENWH
SCAC1318-BEF0-0253-E053-6B04A8C08E51	345000	5/29/2019 0:00	SW14 7HG	F	N	L	1	FLAT 6	ROSEMA	NULL
SCAC1318-BEF1-0253-E053-6B04A8C08E51	367000	5/21/2019 0:00	SE8 4XD	F	N	L	342	FLAT 1A	STANSTEAD ROAD	NULL
SCAC1318-BEF2-0253-E053-6B04A8C08E51	400000	5/24/2019 0:00	SE15 2DU	F	N	L	64A	NULL	ST MARYS ROAD	NULL
SCAC1318-BEF3-0253-E053-6B04A8C08E51	761000	4/18/2019 0:00	SW11 2AJ	F	N	L	30	FLAT B	COLOGNE ROAD	NULL
SCAC1318-BEF4-0253-E053-6B04A8C08E51	382500	5/30/2019 0:00	SW16 5LJ	F	N	L	43	FLAT 1A	KEMPSHOTT ROAD	STREATH
SCAC1318-BEF5-0253-E053-6B04A8C08E51	520000	6/12/2019 0:00	SE11 4BG	F	N	L	1	FLAT 3	COLESHILL ROAD	GEORGE
SCAC1318-BEF7-0253-E053-6B04A8C08E51	450000	5/14/2019 0:00	TW11 0LL	F	N	L	17	NULL	BYTON ROAD	NULL
SCAC1318-BEF8-0253-E053-6B04A8C08E51	470000	6/19/2019 0:00	SW17 9HE	F	N	L	10	FLAT 31	LYNTON F	NULL
SCAC1318-BEFA-0253-E053-6B04A8C08E51	164500	6/13/2019 0:00	SE1 5Z8	F	N	L	1	FLAT 31	GABLES CLOSE	NULL
SCAC1318-BEFB-0253-E053-6B04A8C08E51	342000	6/7/2019 0:00	SE12 0UD	T	N	F	29	FLAT 34	CLARENC	NULL
SCAC1318-BEFC-0253-E053-6B04A8C08E51	193000	5/28/2019 0:00	SW4 8HZ	F	N	L	1	FLAT A	BRALSFORD ROAD	NULL
SCAC1318-BEFD-0253-E053-6B04A8C08E51	599950	4/5/2019 0:00	SW2 2TE	F	N	L	26	NULL	WALLIS CLOSE	NULL
SCAC1318-BEFF-0253-E053-6B04A8C08E51	440000	5/31/2019 0:00	SW11 2BA	F	N	L	11	NULL	BEESFORD ROAD	NULL
SCAC1318-BF00-0253-E053-6B04A8C08E51	410000	5/29/2019 0:00	SW4 7RH	F	N	L	53A	NULL	WALTON HEIGHTS	WALWOR
SCAC1318-BF02-0253-E053-6B04A8C08E51	850000	5/17/2019 0:00	SE17 1FZ	F	Y	L	143	FLAT 513	CUTTER LANE	NULL
SCAC1318-BF03-0253-E053-6B04A8C08E51	505000	3/7/2019 0:00	SE10 0DX	F	Y	L	10	FLAT 4	BLACKFRARS ROAD	NULL
SCAC1318-BF04-0253-E053-6B04A8C08E51	1049...	4/30/2019 0:00	SW18 1S2	F	Y	L	1	FLAT 16	PONTON I	NULL
SCAC1318-BF05-0253-E053-6B04A8C08E51	708700	5/24/2019 0:00	SW11 7AA	F	Y	L	1	FLAT 4	DALBERG ROAD	NULL
SCAC1318-BF06-0253-E053-6B04A8C08E51	600000	5/22/2019 0:00	SW2 1AP	F	Y	L	124A	FLAT 1	APARTMENT ...	NULL
SCAC1318-BF07-0253-E053-6B04A8C08E51	2880...	5/17/2019 0:00	SE1 9QQ	F	Y	L	1	FLAT 102	CUTTER LANE	NULL
SCAC1318-BF08-0253-E053-6B04A8C08E51	460000	3/7/2019 0:00	SE10 0DX	F	Y	L	10	FLAT 408	CUTTER LANE	NULL
SCAC1318-BF09-0253-E053-6B04A8C08E51	520000	3/7/2019 0:00	SE10 0DX	F	Y	L	10	FLAT 413	CUTTER LANE	NULL
SCAC1318-BF10-0253-E053-6B04A8C08E51	500000	3/25/2019 0:00	SE10 0DX	F	Y	L	10	FLAT 1002	PEGLER I	NULL
SCAC1318-BF11-0253-E053-6B04A8C08E51	527250	3/6/2019 0:00	SE3 9FX	F	Y	L	1	FLAT 74	ST JOSEPH	NULL
SCAC1318-BF12-0253-E053-6B04A8C08E51	600000	5/17/2019 0:00	SW8 4EU	F	Y	L	1	FLAT 201	PEGLER I	NULL
SCAC1318-BF13-0253-E053-6B04A8C08E51	380000	5/16/2019 0:00	SE3 9FX	F	Y	L	1	FLAT 902	CUTTER LANE	NULL
SCAC1318-BF14-0253-E053-6B04A8C08E51	565000	3/19/2019 0:00	SE10 0DX	F	Y	L	10	FLAT 612	CUTTER LANE	NULL
SCAC1318-BF15-0253-E053-6B04A8C08E51	540000	4/29/2019 0:00	SE10 0DX	F	Y	L	10	FLAT 1011	CUTTER LANE	NULL
SCAC1318-BF16-0253-E053-6B04A8C08E51	475000	2/28/2019 0:00	SE10 0DX	F	Y	L	10	FLAT 801	DEACON I	NULL
SCAC1318-BF17-0253-E053-6B04A8C08E51	704800	5/21/2019 0:00	SE17 1GB	F	Y	L	1	FLAT 3	HORRINI	NULL
SCAC1318-BF18-0253-E053-6B04A8C08E51	489995	6/28/2019 0:00	SE17 9FW	F	Y	L	1	FLAT 3	HORRINI	NULL

Executing query... VB8MKOQ\SQLEXPRESS ... DESKTOP-4V8MKOQ\user (65) Assignmnt 00:00:07 0 rows

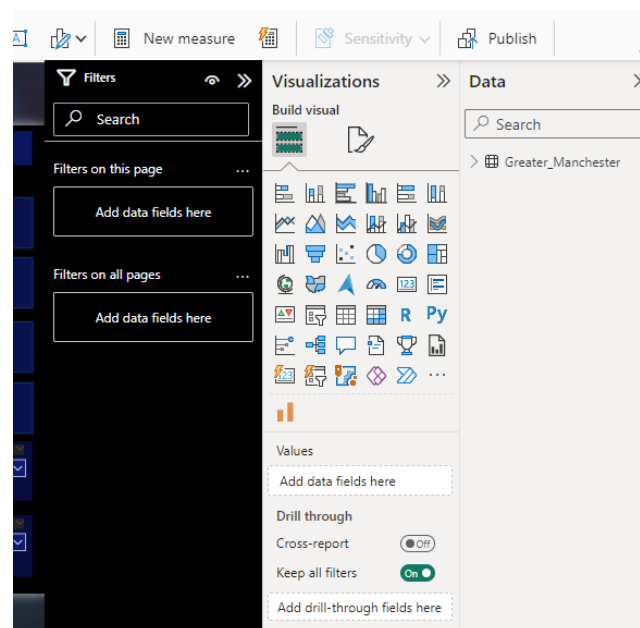
Dashboard Design

Import the data to the Power BI

- Open power BI software
- Select SQL Server to data import.
- Load data to power BI

	District	County	PPD Category Type	Record Status	Price Range
1	TAMESIDE	GREATER MANCHESTER	B	A	0-10000000
2	TRAFFORD	GREATER MANCHESTER	A	A	0-10000000
3	WIGAN	GREATER MANCHESTER	A	A	0-10000000
4	MANCHESTER	GREATER MANCHESTER	B	A	0-10000000
5	BOLTON	GREATER MANCHESTER	A	A	0-10000000
6	WIGAN	GREATER MANCHESTER	A	A	0-10000000
7	OLDHAM	GREATER MANCHESTER	A	A	0-10000000
8	MANCHESTER	GREATER MANCHESTER	A	A	0-10000000
9	BOLTON	GREATER MANCHESTER	A	A	0-10000000
10	OLDHAM	GREATER MANCHESTER	A	A	0-10000000
11	OLDHAM	GREATER MANCHESTER	A	A	0-10000000
12	TAMESIDE	GREATER MANCHESTER	A	A	0-10000000
13	BOLTON	GREATER MANCHESTER	A	A	0-10000000
14	MANCHESTER	GREATER MANCHESTER	A	A	0-10000000
15	TAMESIDE	GREATER MANCHESTER	A	A	0-10000000
16	TRAFFORD	GREATER MANCHESTER	A	A	0-10000000
17	TRAFFORD	GREATER MANCHESTER	A	A	0-10000000
18	TAMESIDE	GREATER MANCHESTER	A	A	0-10000000
19	BOLTON	GREATER MANCHESTER	B	A	0-10000000
20	MANCHESTER	GREATER MANCHESTER	A	A	0-10000000
21	ROCHDALE	GREATER MANCHESTER	B	A	0-10000000
22	SALFORD	GREATER MANCHESTER	B	A	0-10000000
23	MANCHESTER	GREATER MANCHESTER	R	A	0-10000000

- Then we have to create dashboard using bar graphs, pie charts, maps etc. (to visualization)



Dashboard purpose

Creating a Power BI Dashboard for the Greater Manchester Property Price Monitor involves designing visuals that serve the purpose of providing actionable insights into the local property market. The dashboard aims to help users, including industry stakeholders, researchers, and policymakers to understand,

- sales trends
- price distribution
- geospatial patterns
- sales volume in Greater Manchester area.

Sales Trends Analysis

- **Visualisation Method :** Line Chart
- **Purpose :** Recognize peak months, seasonal trends, and market trends to better understand the long-term trends in real estate sales.



The image shows a configuration window for a Power BI visual. It has two main sections: 'X-axis' and 'Y-axis'. The 'X-axis' section contains three items: 'Date_of_Transfer', 'Year', and 'Month'. The 'Y-axis' section contains one item: 'Sum of Price'. Each item has a dropdown arrow and an 'X' icon to its right, indicating it can be selected or removed.

X-axis	
Date_of_Transfer	▼ X
Year	X
Month	X

Y-axis	
Sum of Price	▼ X

Legend

Date_of_Transfer

Year

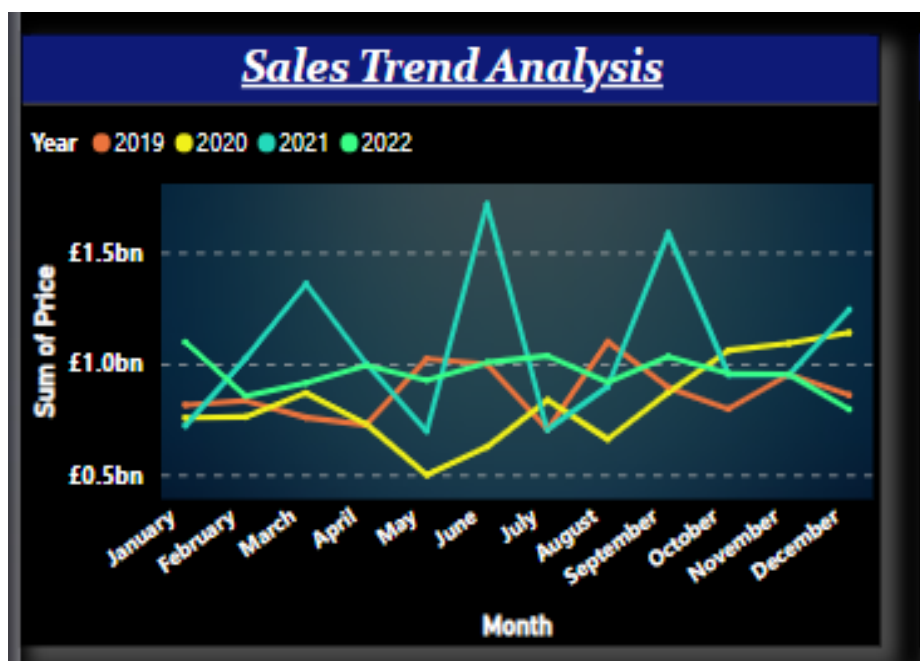
Small multiples

Add data fields here

Tooltips

Add data fields here

Drill through



Price Distribution

- **Visualization Method :** Histogram
- **Purpose :** Examine the distribution of property prices, noting common price ranges and anomalies to gain specific market information.

X data

Price

Y data

Price (bins)

Drill through

Cross-report

Keep all filters

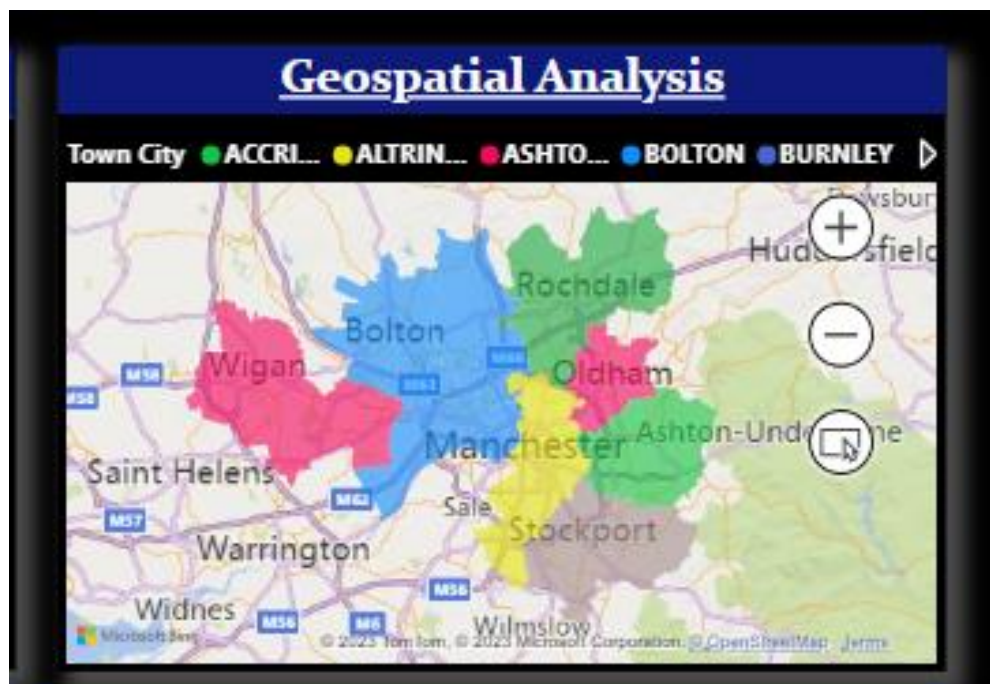
Add drill-through fields here



Geospatial Analysis

- **Visualization Method** : Map
- **Purpose** : Find regions with different sales activity to provide geographical insights for the real estate market's strategic decision-making.

Location
District ▼ ×
Legend
Town City ▼ ×
Latitude
Add data fields here
Longitude
Add data fields here



Sales Volume

- **Visualization Method** : Column or bar chart representing the number of sales in different price brackets.
- **Purpose** : Examine sales volume within particular price ranges to provide information about consumer preferences and market segmentation.

X-axis

Price (bins) ▼ ×

Y-axis

Sum of Price ▼ ×

Legend

Add data fields here

Small multiples

Add data fields here



Final Dashboard



CONCLUSION

The Greater Manchester Property Price dashboard helps users analyze data on the UK real estate market. The Greater Manchester region real estate market for the years 2019, 2020, 2021, and 2022 may be analyzed with Greater Manchester Property Price Monitor, a straightforward and reasonably priced power BI-based reporting tool. Bolton, Bury, Manchester, Oldham, Rochdale, Salford, Stockport, Tameside, Trafford, and Wigan are among the ten districts that make up the Greater Manchester area. The dashboard has provided us with some crucial information.

The dashboard findings showed that the following data was gathered. The Sales Trend Analysis line chart indicates that the lowest sales occurred in May 2020 and the highest sales occurred in June 2021. Property Price Distribution is depicted by the histogram, which has a big right tail and positive skewness. The Sales Volume bar graph illustrates that the maximum price range for properties is 0 to 10000000. The dashboard shows that the total sales price is £44.65 billion, the average sales price is £25.2K, and the maximum sales price is £292M. To provide efficient data management and user-friendliness, this approach required the creation of tables, views, and stored procedures.

Using this large dataset, a complete Energy BI dashboard was developed to satisfy user expectations and accurately assess the local real estate market. For effective market analysis, a simple visualization dashboard should have the following:

A dynamic line chart illustrates the patterns in monthly real estate sales over time. A clear and understandable representation of sales distribution across various areas can be obtained by using map visualization, whereas volume of goods sold is represented by a bar or bar chart that shows sales volumes in various price categories. This illustrates the relationship between price ranges and sales. Property price distribution primarily highlights price ranges and unusual patterns in the market. Integrating information from several sources allows for a comprehensive analysis of the Greater Manchester real estate market.

Users may obtain actionable information to make wise judgments in the real estate industry by utilizing the Power BI dashboard.

