General Sir John Kotelawala Defence University

Faculty of Management, Social Sciences and Humanities

Department of Languages

BSc in Applied Data Science Communication

Group - 09

D/ADC/23/0027 – PGD Rodrigo
D/ADC/23/0031 – PRM Perera
D/ADC/23/0034 – AGAUS Gunasekara
D/ADC/23/0040 – PMSS Rathnayaka

SQL for Data Science (LB1224)

Year 1: Semester 2

Group Assignment

30.11.2023

The Report of

Crimes in London

Metropolitan Police Areas

& Dashboard design

Table of content

Task 02

Introduction

This report describes about Crimes in London metropolitan police areas. Metropolitan Police District consists of the 32 London boroughs but does not include the City of London proper – the central financial district – which is policed by a separate force, the City of London Police. All data is broken down by financial year for each crime type and can be filtered by Basic Command Unit (BCU) and Borough.

The raw data has been taken from UK MPS (Metropolitan Police Service) Monthly Crime Datasets, which contains information about the monthly crimes from 2015 - 2023. This report illustrate key metrics and insights into the crime statistics within the Metropolitan Police area. Also this report includes how to import data for Microsoft SQL Server and importing data to Power BI from Microsoft SQL Server and the steps that have followed to create Power BI Dashboard. This report clearly and orderly describes all the steps in designing a dashboard. The data are summarized and viewed through various types of charts to identify the changes that occur during each year.

Exploration of data

Data Set Review

This data set contains both string and numeric data under the column names; Month_Year, Brough_SNT, Area Name, Area Code, Crime Type, Crime Subtype, Measure, Financial Year, Count, Outliers.

Below is a description of them;

1. Month_Year – The date that the crime was happened.
2. Brough_SNT – The Brought Safer Neighbourhoods Team
3. Area Name – Name of the Area
4. Area Code
5. Crime Type
6. Crime Subtype

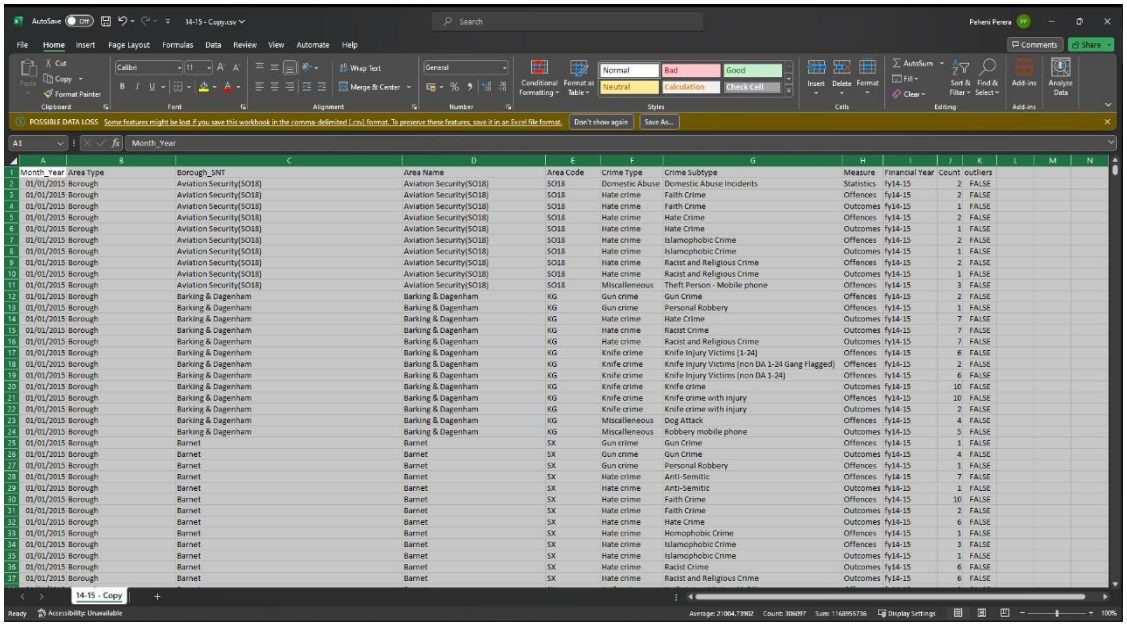
7. Measure – Measurements (Statistics, offences, outcomes)
8. Financial Year
9. Count
10. Outliers – Is outliers occurs or not (TRUE/FALSE)

Importing Data from Excel to a Microsoft SQL Server Database

1. Download the datasets from the below link.

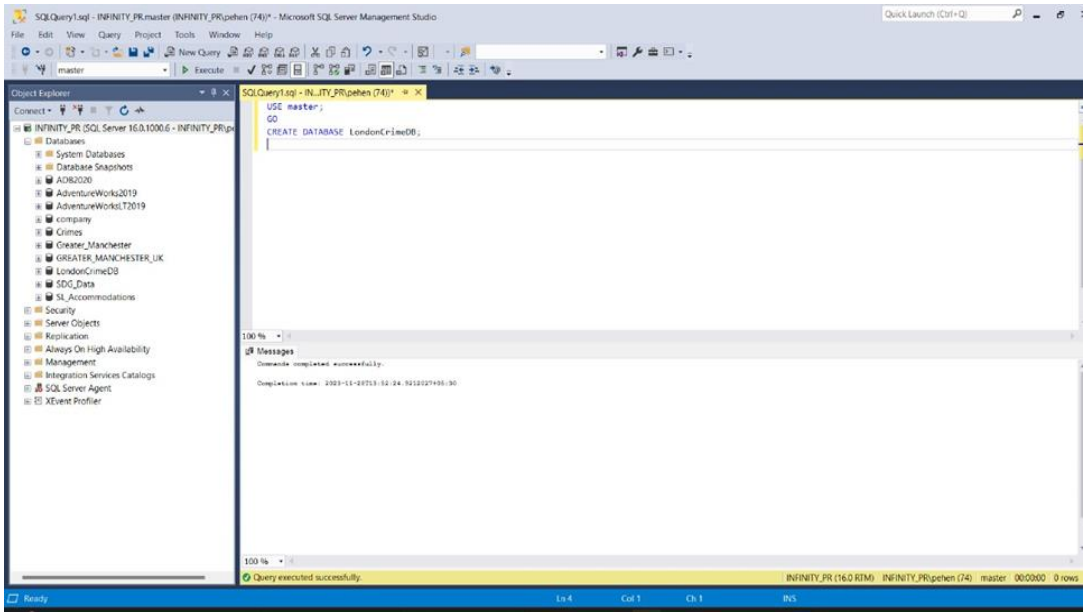
(https://data.london.gov.uk/dataset/mps-monthly-crime-dahboard-data)

2. Remove the outliers, blank spaces, Not known values from the datasets.



Month_Year	Area Type	Borough_SNT	Area Name	Area Code	Crime Type	Crime Subtype	Measure	Financial Year	Count	outliers
01/01/2015	Borough	Aviation Security(SO18)	Aviation Security(SO18)	SO18	Domestic Abuse	Domestic Abuse Incidents	Statistics	fy14-15	2	FALSE
01/01/2015	Borough	Aviation Security(SO18)	Aviation Security(SO18)	SO18	Hate crime	Faith Crime	Offences	fy14-15	2	FALSE
01/01/2015	Borough	Aviation Security(SO18)	Aviation Security(SO18)	SO18	Hate crime	Faith Crime	Outcomes	fy14-15	1	FALSE
01/01/2015	Borough	Aviation Security(SO18)	Aviation Security(SO18)	SO18	Hate crime	Hate Crime	Offences	fy14-15	2	FALSE
01/01/2015	Borough	Aviation Security(SO18)	Aviation Security(SO18)	SO18	Hate crime	Hate Crime	Outcomes	fy14-15	1	FALSE
01/01/2015	Borough	Aviation Security(SO18)	Aviation Security(SO18)	SO18	Hate crime	Islamophobic Crime	Offences	fy14-15	2	FALSE
01/01/2015	Borough	Aviation Security(SO18)	Aviation Security(SO18)	SO18	Hate crime	Islamophobic Crime	Outcomes	fy14-15	1	FALSE
01/01/2015	Borough	Aviation Security(SO18)	Aviation Security(SO18)	SO18	Hate crime	Racist and Religious Crime	Offences	fy14-15	2	FALSE
01/01/2015	Borough	Aviation Security(SO18)	Aviation Security(SO18)	SO18	Hate crime	Racist and Religious Crime	Outcomes	fy14-15	1	FALSE
01/01/2015	Borough	Aviation Security(SO18)	Aviation Security(SO18)	SO18	Miscalleneous	Theft Person - Mobile phone	Offences	fy14-15	3	FALSE
01/01/2015	Borough	Barking & Dagenham	Barking & Dagenham	KG	Gun crime	Gun Crime	Offences	fy14-15	2	FALSE
01/01/2015	Borough	Barking & Dagenham	Barking & Dagenham	KG	Gun crime	Personal Robbery	Offences	fy14-15	1	FALSE
01/01/2015	Borough	Barking & Dagenham	Barking & Dagenham	KG	Hate crime	Hate Crime	Outcomes	fy14-15	7	FALSE
01/01/2015	Borough	Barking & Dagenham	Barking & Dagenham	KG	Hate crime	Racist Crime	Outcomes	fy14-15	7	FALSE
01/01/2015	Borough	Barking & Dagenham	Barking & Dagenham	KG	Hate crime	Racist and Religious Crime	Outcomes	fy14-15	7	FALSE
01/01/2015	Borough	Barking & Dagenham	Barking & Dagenham	KG	Knife crime	Knife Injury Victims (1-24)	Offences	fy14-15	6	FALSE
01/01/2015	Borough	Barking & Dagenham	Barking & Dagenham	KG	Knife crime	Knife Injury Victims (non DA 1-24 Gang Flagged)	Offences	fy14-15	2	FALSE
01/01/2015	Borough	Barking & Dagenham	Barking & Dagenham	KG	Knife crime	Knife Injury Victims (non DA 1-24)	Offences	fy14-15	6	FALSE
01/01/2015	Borough	Barking & Dagenham	Barking & Dagenham	KG	Knife crime	Knife crime	Outcomes	fy14-15	10	FALSE
01/01/2015	Borough	Barking & Dagenham	Barking & Dagenham	KG	Knife crime	Knife crime with injury	Offences	fy14-15	10	FALSE
01/01/2015	Borough	Barking & Dagenham	Barking & Dagenham	KG	Knife crime	Knife crime with injury	Outcomes	fy14-15	2	FALSE
01/01/2015	Borough	Barking & Dagenham	Barking & Dagenham	KG	Miscalleneous	Dog Attack	Offences	fy14-15	4	FALSE
01/01/2015	Borough	Barking & Dagenham	Barking & Dagenham	KG	Miscalleneous	Robbery mobile phone	Outcomes	fy14-15	5	FALSE
01/01/2015	Borough	Barnet	Barnet	5X	Gun crime	Gun Crime	Offences	fy14-15	1	FALSE
01/01/2015	Borough	Barnet	Barnet	5X	Gun crime	Gun Crime	Outcomes	fy14-15	4	FALSE
01/01/2015	Borough	Barnet	Barnet	5X	Gun crime	Personal Robbery	Offences	fy14-15	1	FALSE
01/01/2015	Borough	Barnet	Barnet	5X	Hate crime	Anti-Semitic	Offences	fy14-15	7	FALSE
01/01/2015	Borough	Barnet	Barnet	5X	Hate crime	Anti-Semitic	Outcomes	fy14-15	1	FALSE
01/01/2015	Borough	Barnet	Barnet	5X	Hate crime	Faith Crime	Offences	fy14-15	10	FALSE
01/01/2015	Borough	Barnet	Barnet	5X	Hate crime	Faith Crime	Outcomes	fy14-15	2	FALSE
01/01/2015	Borough	Barnet	Barnet	5X	Hate crime	Hate Crime	Outcomes	fy14-15	6	FALSE
01/01/2015	Borough	Barnet	Barnet	5X	Hate crime	Homophobic Crime	Offences	fy14-15	1	FALSE
01/01/2015	Borough	Barnet	Barnet	5X	Hate crime	Islamophobic Crime	Offences	fy14-15	3	FALSE
01/01/2015	Borough	Barnet	Barnet	5X	Hate crime	Islamophobic Crime	Outcomes	fy14-15	1	FALSE
01/01/2015	Borough	Barnet	Barnet	5X	Hate crime	Racist Crime	Outcomes	fy14-15	6	FALSE
01/01/2015	Borough	Barnet	Barnet	5X	Hate crime	Racist and Religious Crime	Outcomes	fy14-15	6	FALSE

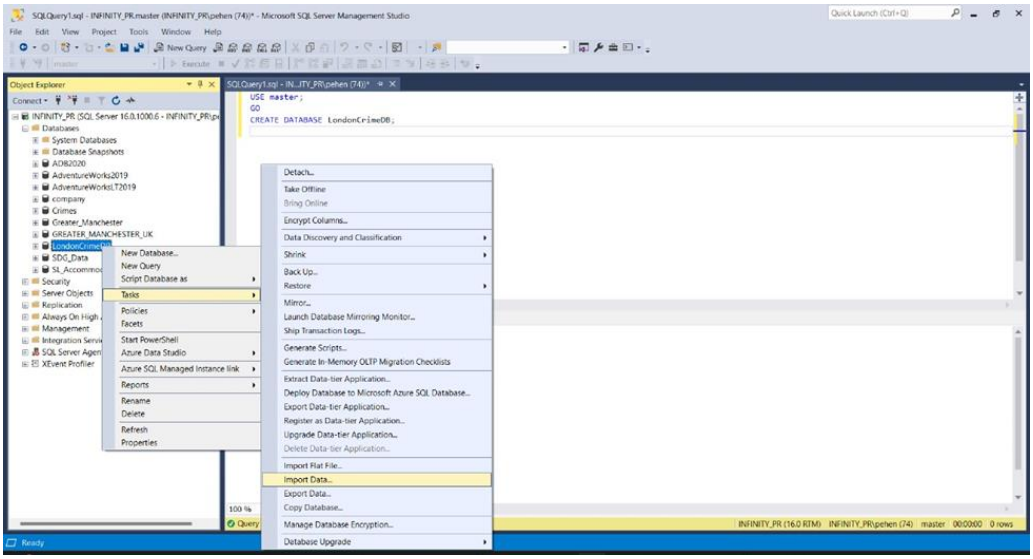
3. Open SSMS and connect to SQL server instance.
4. Create a new database called “LondonCrimeDB”.



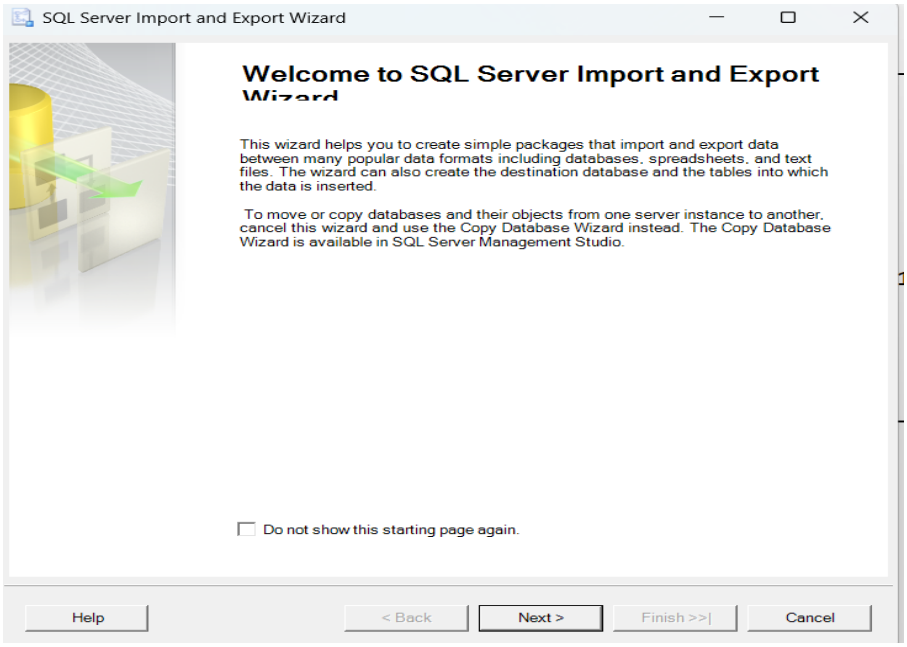
5. Import the CSV file to the SQL server database “LondonCrimeDB”.

   a) Right-click the ‘LondonCrimeDB’ database.

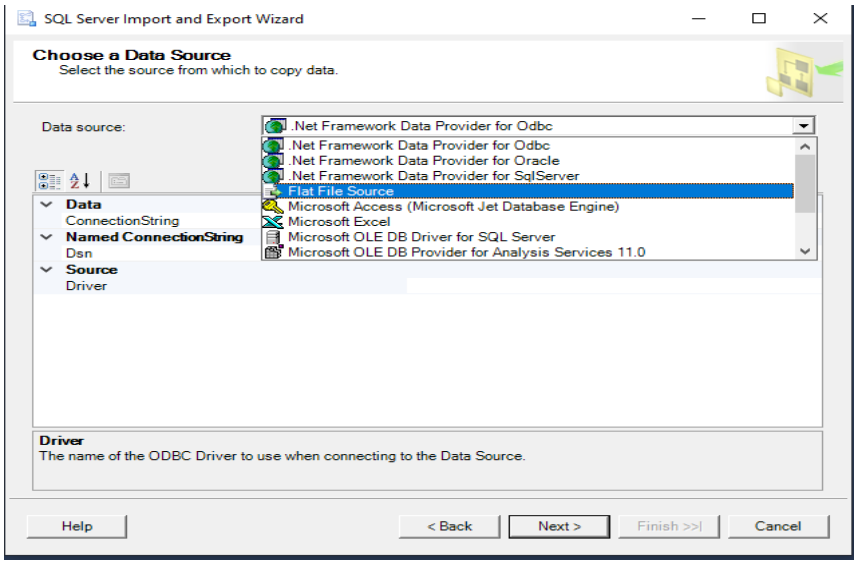
   b) Select Tasks → Import Data

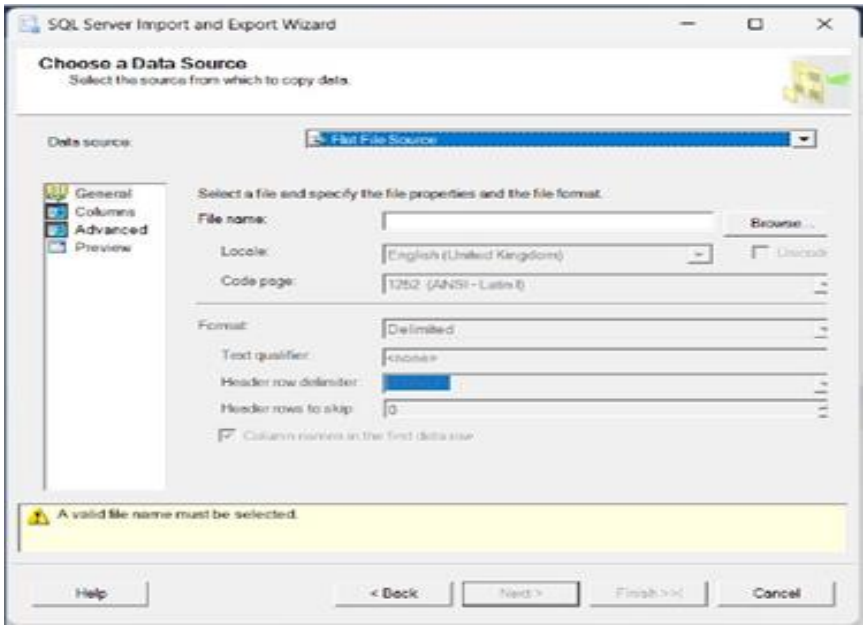


c) Click Next on the SQL Server Import and Export Wizard welcome page.

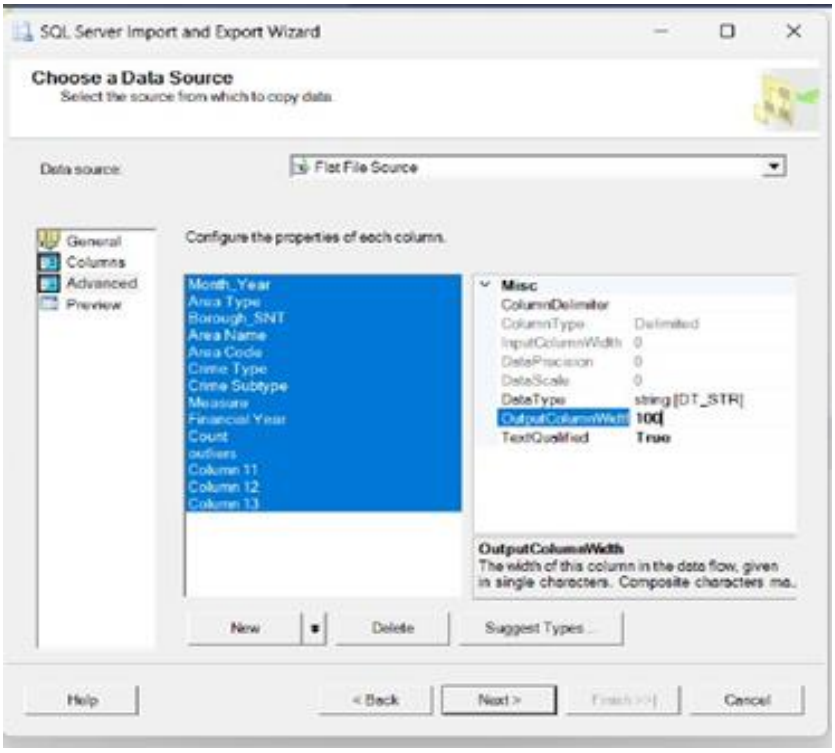


d) Select Flat File Source as the Data Source, and enter or browse for the file to import.

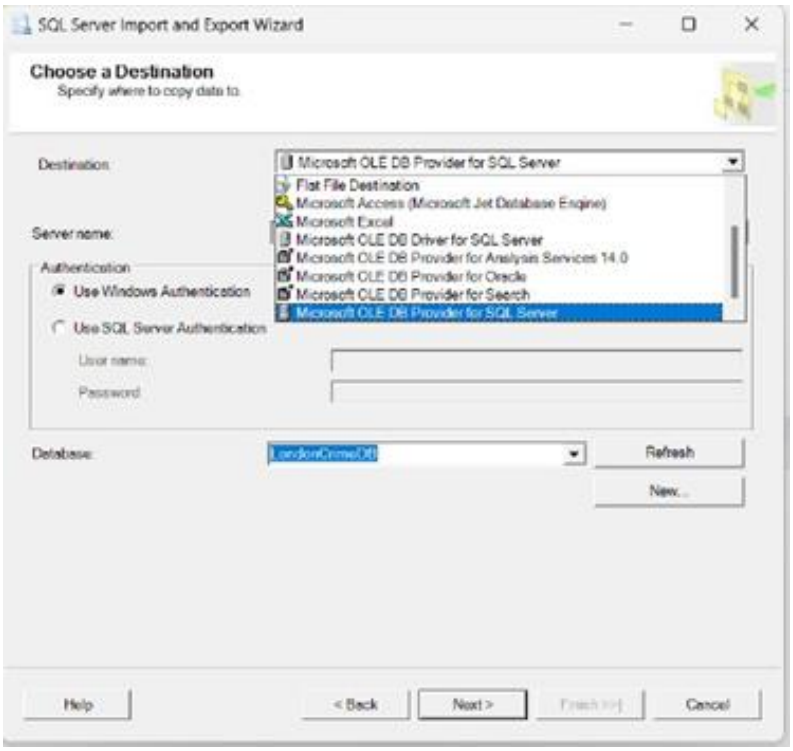




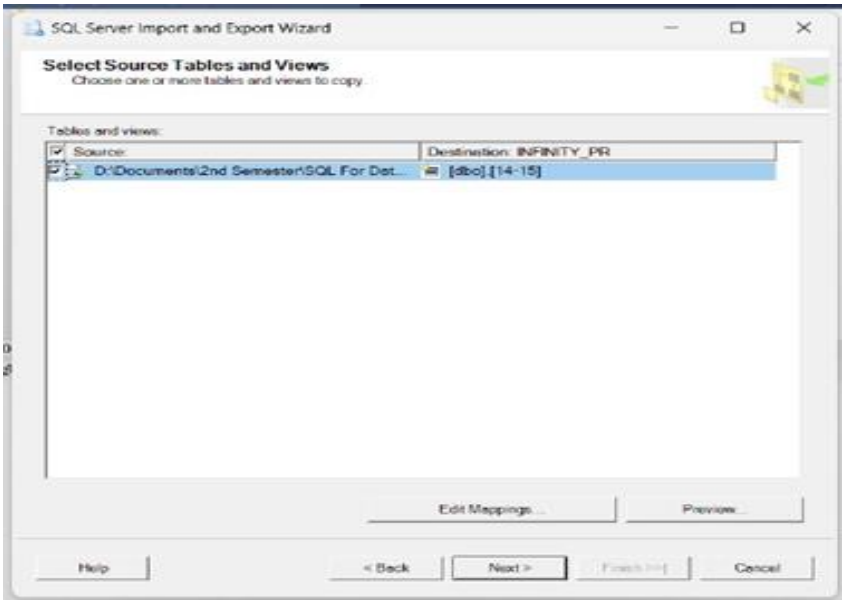
e) Go to the Advanced tab and change all the column widths from 50 to 100 and click Next.

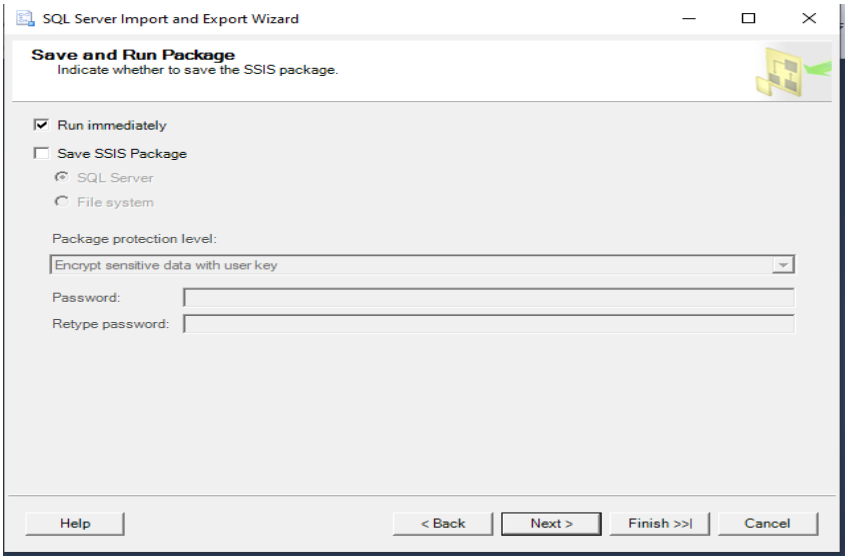


f) Select Microsoft OLE DB Provider for SQL Server and click next.

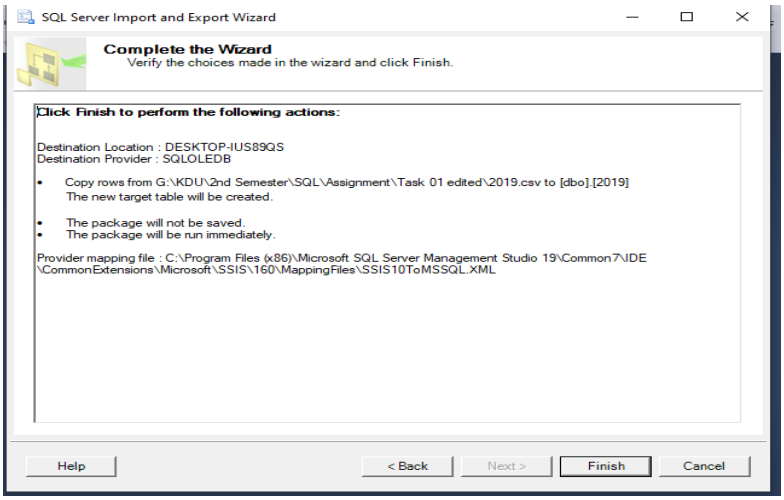


g) Accept the default and click next.

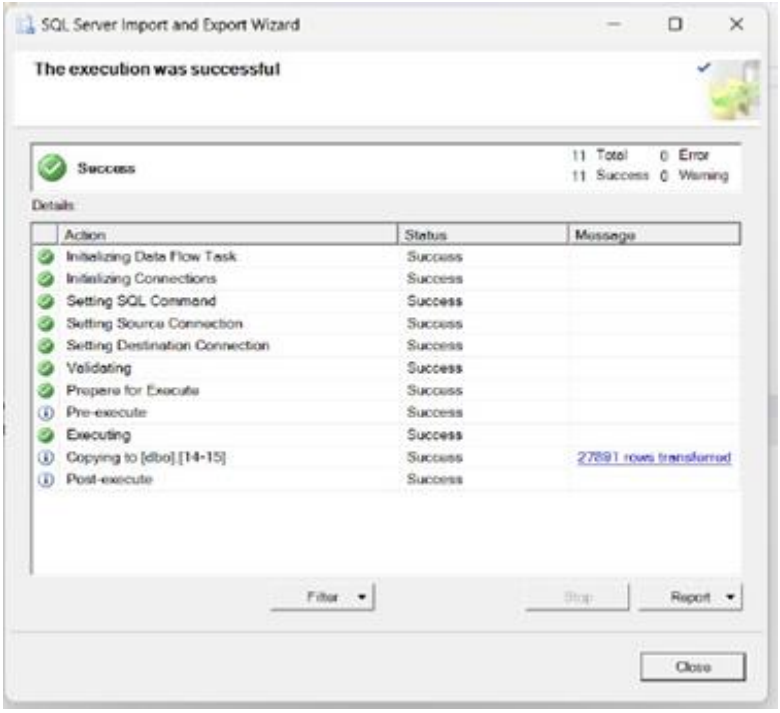




h) Click Finish.



i) The Execution Results dialog box appears. Assuming that all went well, the data has loaded successfully.

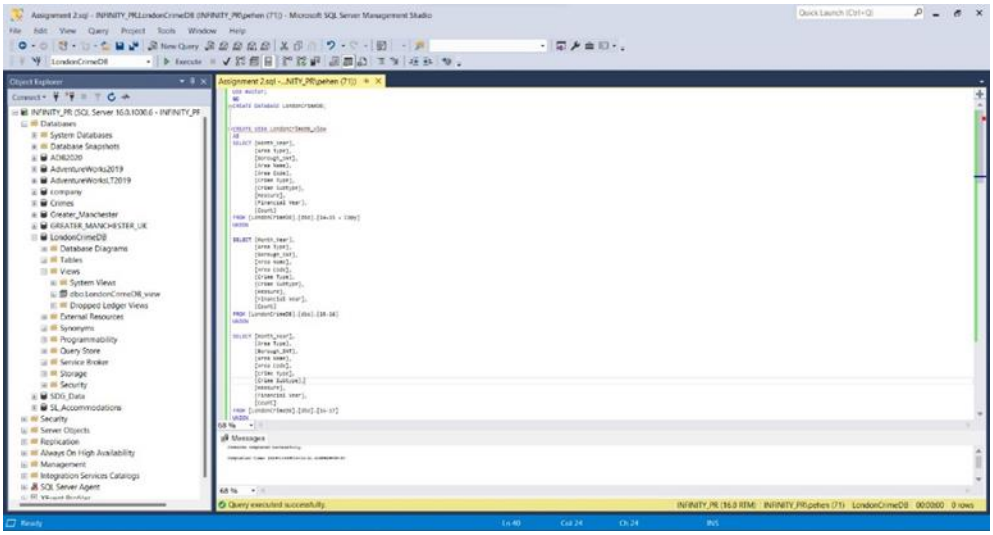


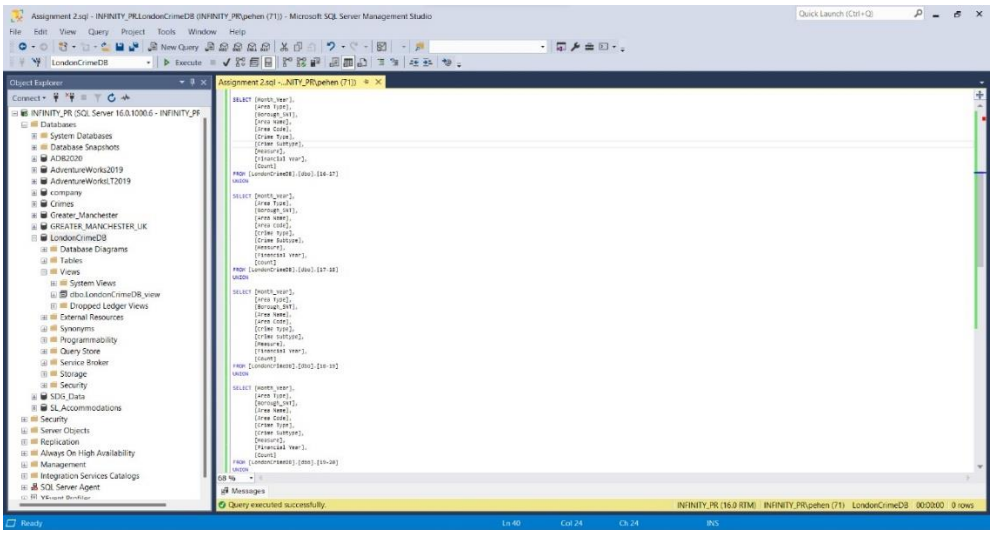
After we can see the new table in the ‘LondonCrimeDB’ database.

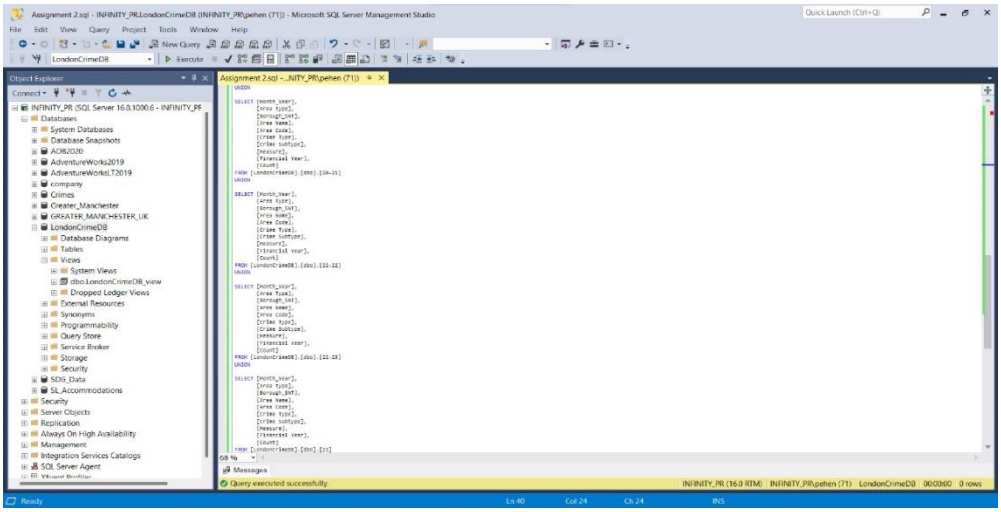
You must repeat the same procedure to add the other Excel files to the ‘LondonCrimeDB’ database.

Create View

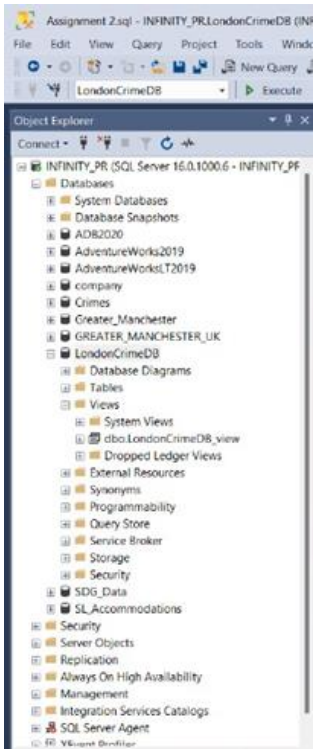
Under a new query, enter the following code to create view ‘LondonCrimeDB_view’.







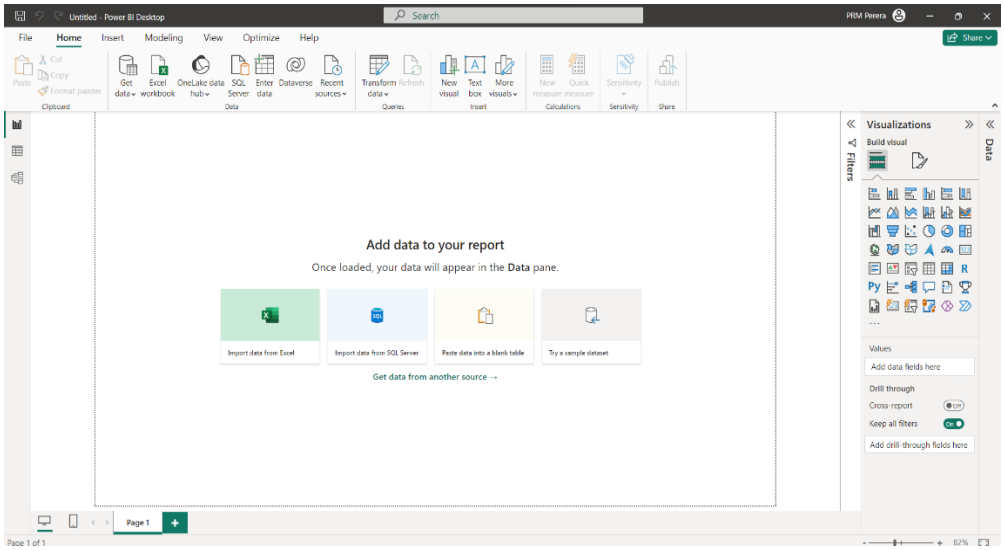
You can see the ‘dbo.LondonCrimeDB_view’ under the views, in ‘LondonCrimeDB’ database.



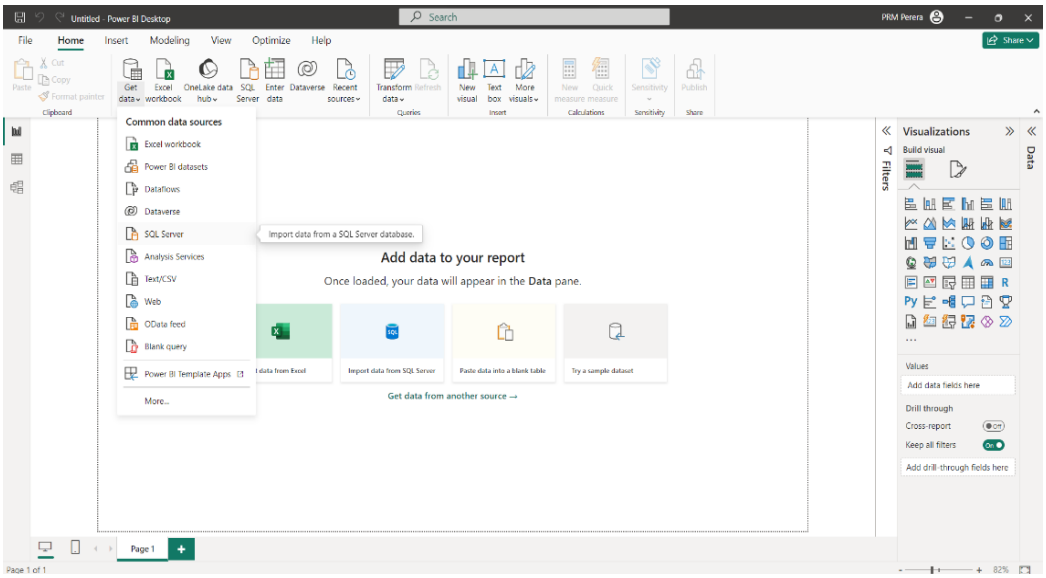
Dashboard design and Implementation

Bring Data into Power BI

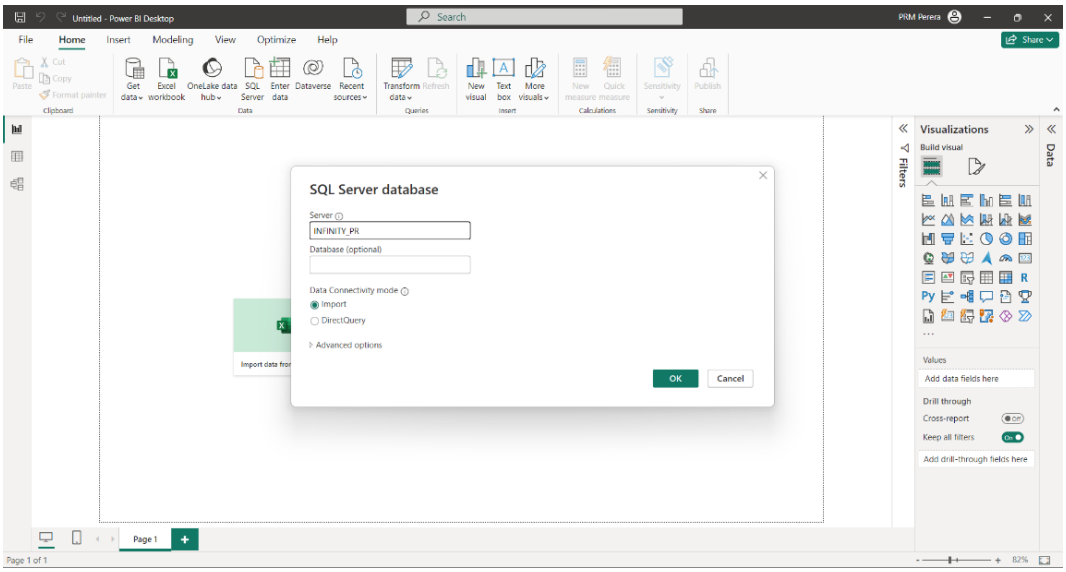
1. Open Power Bi desktop



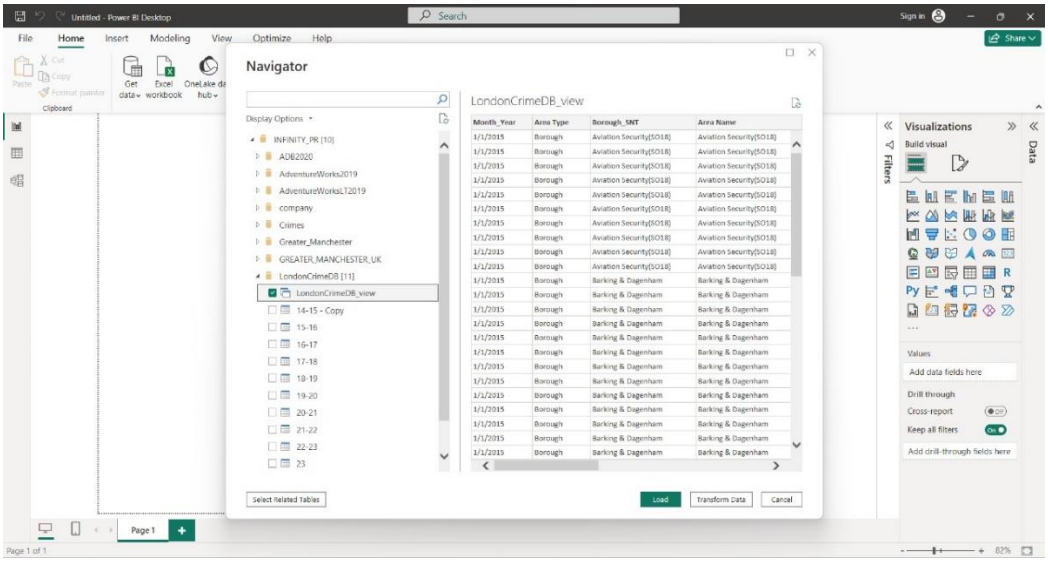
2. Select Get Data → SQL Server



3. From SQL Server Database Server connect to your server. Then select Import and OK.



4. In Navigator Tab, select ‘LondonCrimeDB_view’ view from ‘LondonCrimeDB’ Database.



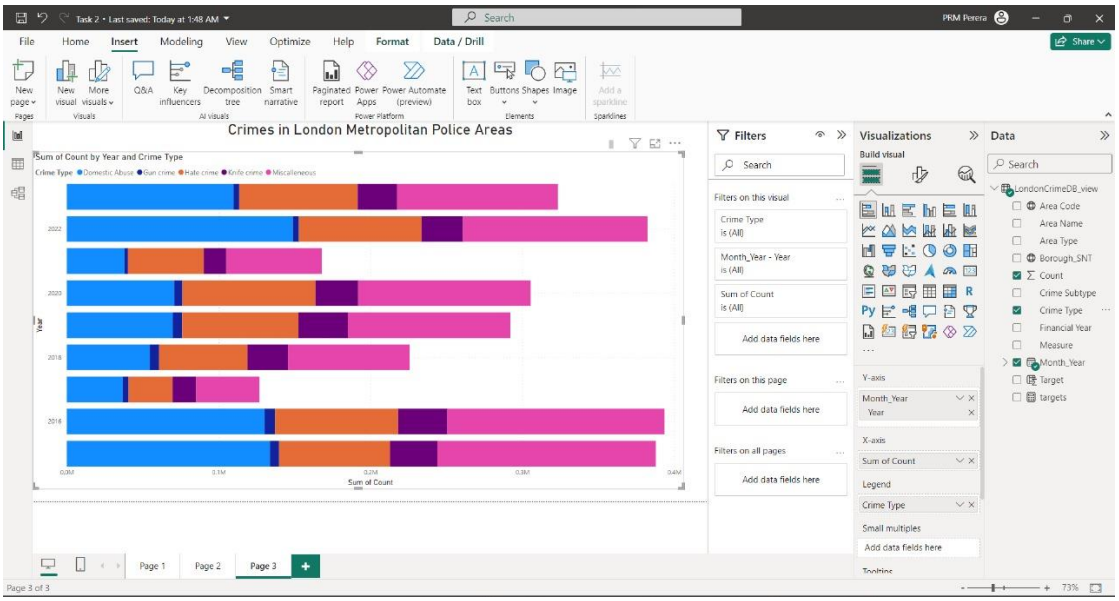
Dashboard draw up

1. <u>Creating the Bar chart.</u>

   First go to visualizations & select stacked bar chart.

   Then, go to values and add column ‘Month_Year’ (Year) into X-axis. Add column ‘Sum of Count’ into Y-axis. Add legend as ‘Crime Type’.

   The column chart views as follows.



The above bar chart visualizes the incidents per crime category.

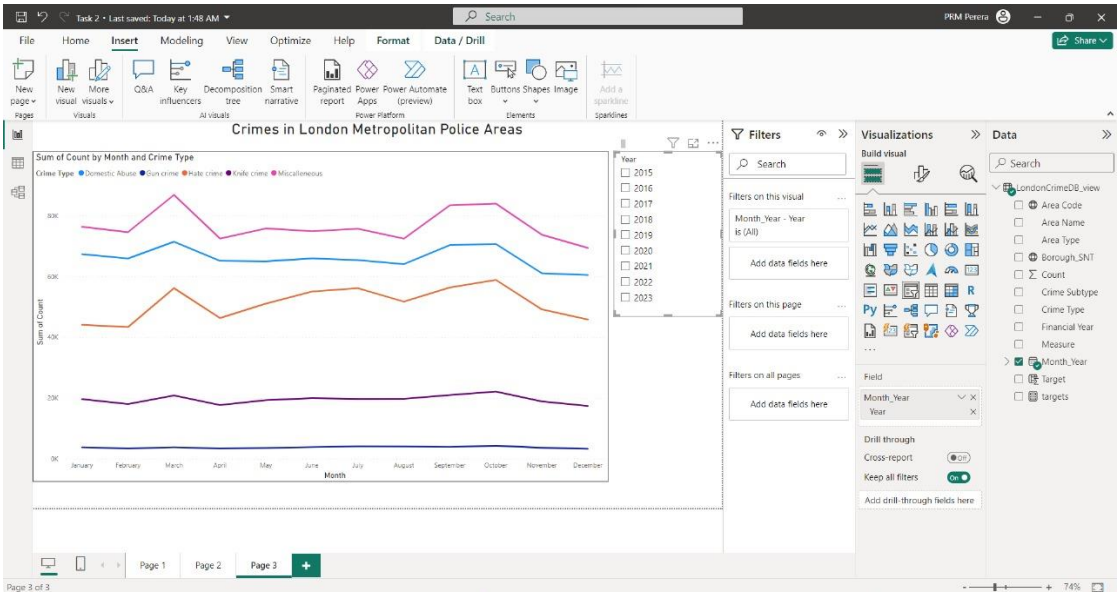
2. <u>Creating the Line chart.</u>

   First go to visualization & select line chart.

   Then, go to values and add column ‘Month_Year’ (Month) into X-axis. Add column ‘Sum of count’ into Y-axis. Add legend as ‘Crime Type’.

   A new slice also added to compare crime types with years.

   The line chart views as follows.



   The above line chart shows the monthly variations in crime incidents.

3. <u>Creating the Map.</u>

   First go to visualizations & select ARCGIS Maps for Power BI.

   Then, enter the values as follows.

   ‘Location’ → ‘Borough_SNT’

   ‘Size’ → ‘Sum of Count’

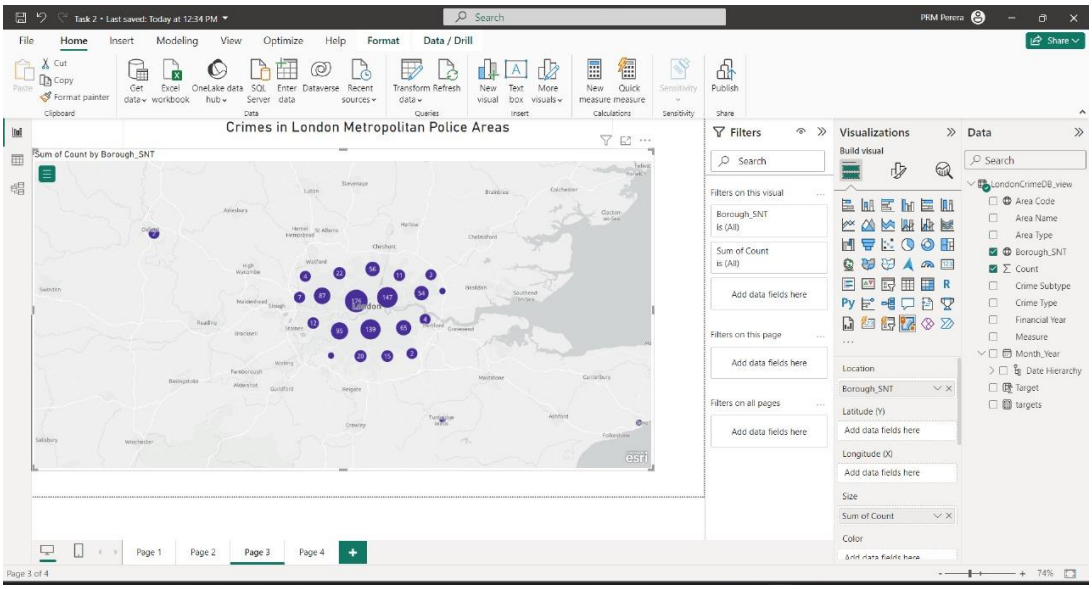
   Then select collapse map tools → view a list of layers on the map

   Layers → ‘Borough_SNT’ →Layer options → Location type → Change many countries into one country, United Kingdom → OK

   Go to Clustering →Enable

   Go to Labeling → Enable

   The map view as follows.



The above map illustrate crime hotspots across different regions.

4. <u>Creating the KPI.</u>

First, select KPI from visualizations. You have to create 3 KPIs as follows.

1 – Count of Measure.

Value → 'Sum of Count'

Trend Axis → 'Measure'

2 – Count of Crime type.

Value → 'Sum of Count'

Trend Axis → 'Crime Type'

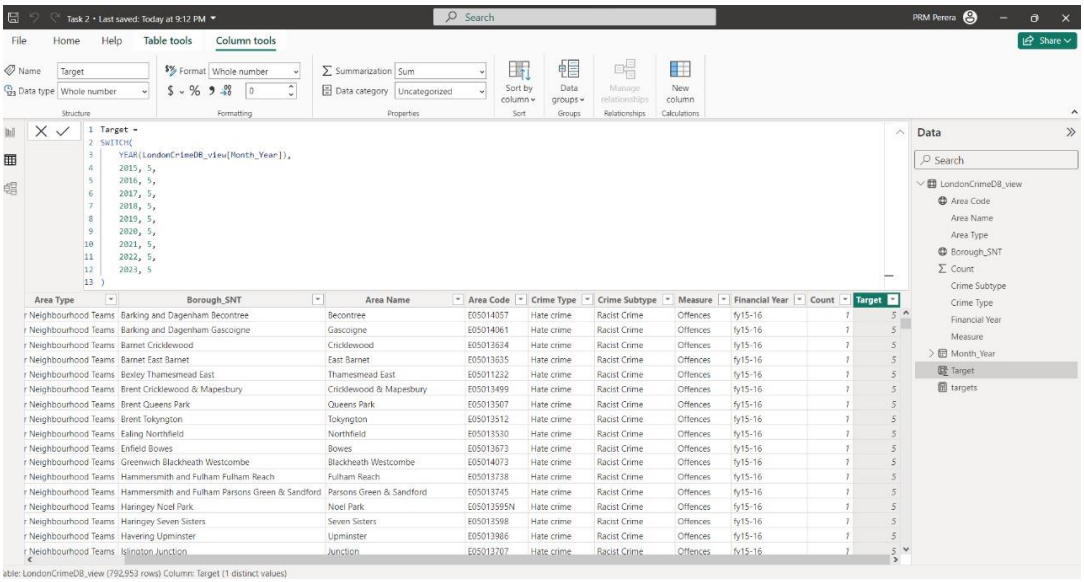
Target → Sum of Target

3 – Count of Crime type by year

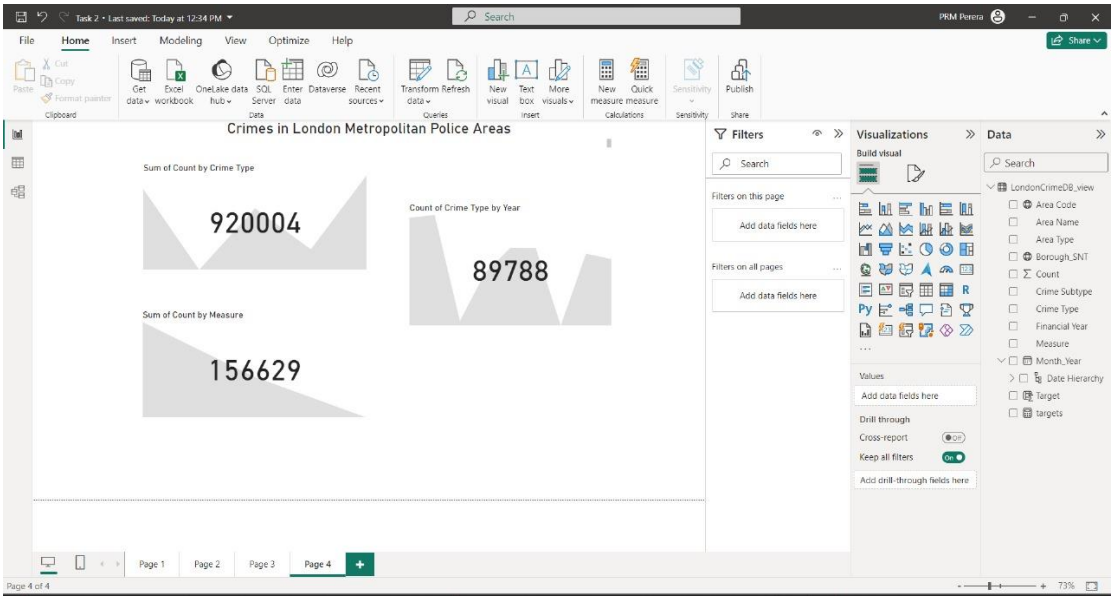
Value → 'Count of Crime type'

Trend Axis → 'Month_Year' (Year)

In 2nd KPI we have added a new target column to include five crimes per day in yearly. The below code entered to create the target column:

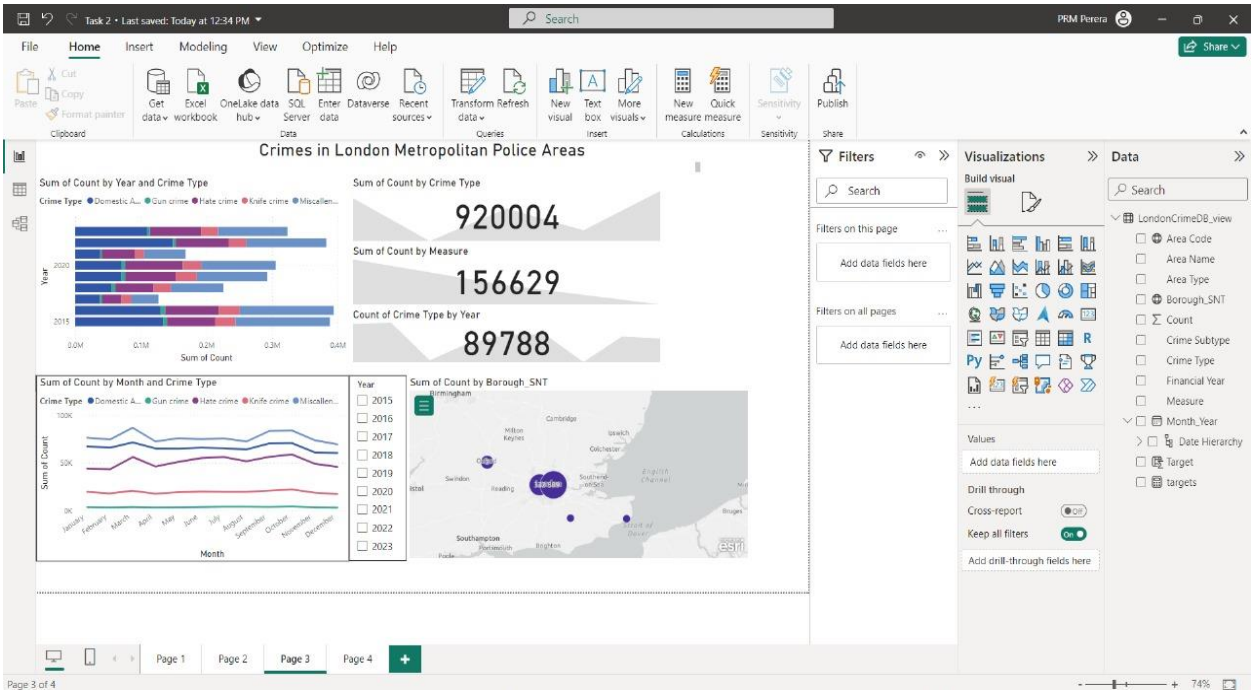


The above 3 KPIs view as follows.



Dashboard Illustration

The above charts combination shows as follows.



The final dashboard views as follows.

Conclusion

This report discusses crime in London's metropolitan police regions. The Metropolitan Police area includes the 32 London boroughs but excludes the City of London proper - the key financial area - which is policed by a distinct agency, the City of London Police. All data is broken down by fiscal year for each crime type and may be filtered by Basic Command Unit (BCU) and Borough. The raw data was obtained from the UK MPS (Metropolitan Police Service) Monthly Crime Datasets, which feature information on monthly crimes from 2015 to 2023. Crimes in London Metropolitan Police Areas monitor is a simple and low-cost power BI-based reporting solution that can be used to analyses the raw data has been taken from UK MPS (Metropolitan Police Service) Monthly Crime Datasets, which contains information about the monthly crimes from 2015 – 2023 according to the type of the crime as Miscalleneous, Domestic Abuse, Hate crime, Knife crime and Gun crime. The map in the dashboard shows the crime distribution in London Metropolitan Police area. Percentage pie chart depicts the percentages of crime by the type; it shows highest percentage of crimes occurred as Miscalleneous (35.31%, 920K) and lowest percentage of crimes occurred as Gun crimes. There is a slight difference between Domestic Abuse crimes and Hate crimes. Crime Comparison by Category and Year shows sum of count of crimes occurred according to the year and crime type. It shows maximum count of crimes in 2016 (nears to 0.4M) when minimum crimes in 2017. The line chart Monthly Crime Distribution depicts sum count of crimes occurred according to the month and crime type. According to the dashboard; count of measure is 156629, count of crime type is 920004 and count of crime type by year is 89788.