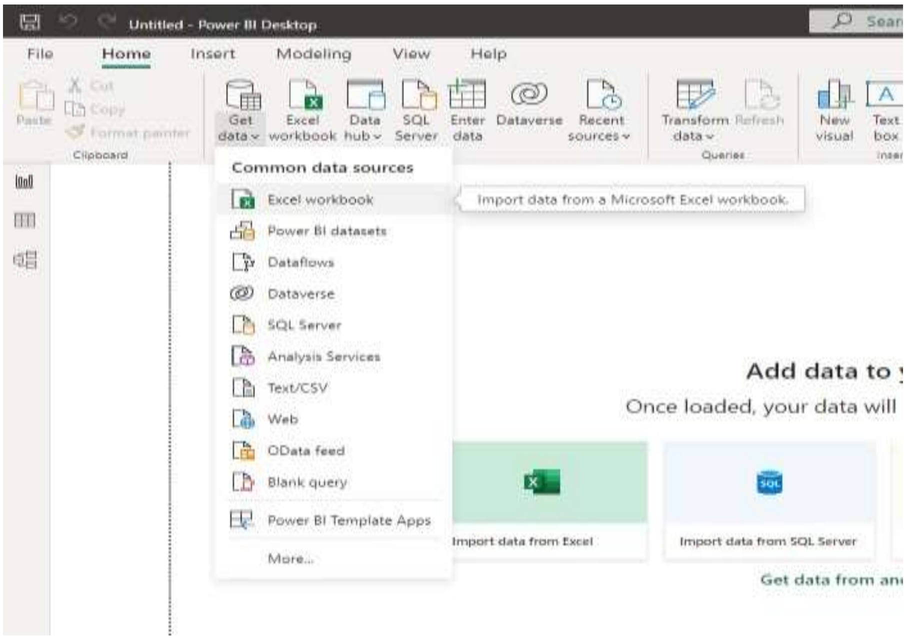
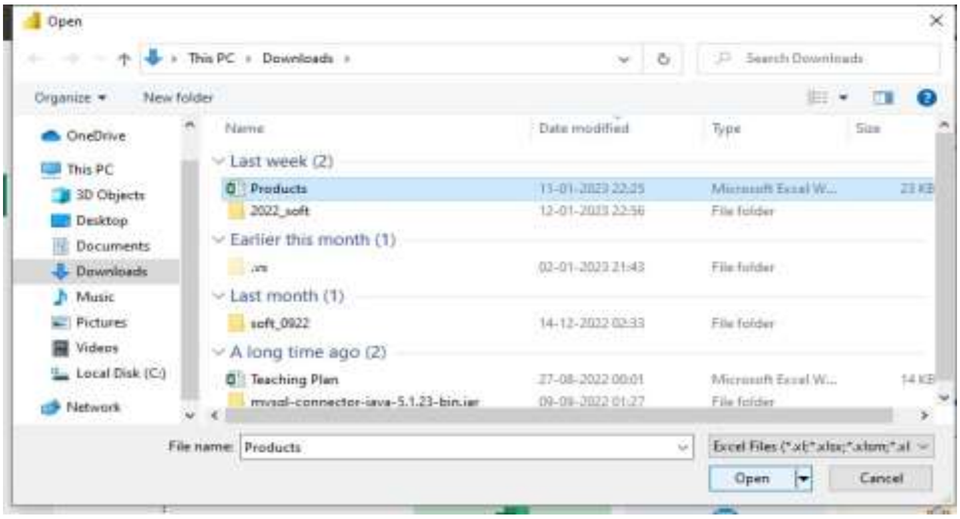
PRACTICALS

Practical 1: Import Excel and odata feed.

Step 1 - Launch Power BI Desktop.
Step 2 - From the Home ribbon, select Get Data. Excel is one of the Most Common data connections, so you can select it directly from the Get Data menu.
Step 3- select File > Excel and select
Connect.

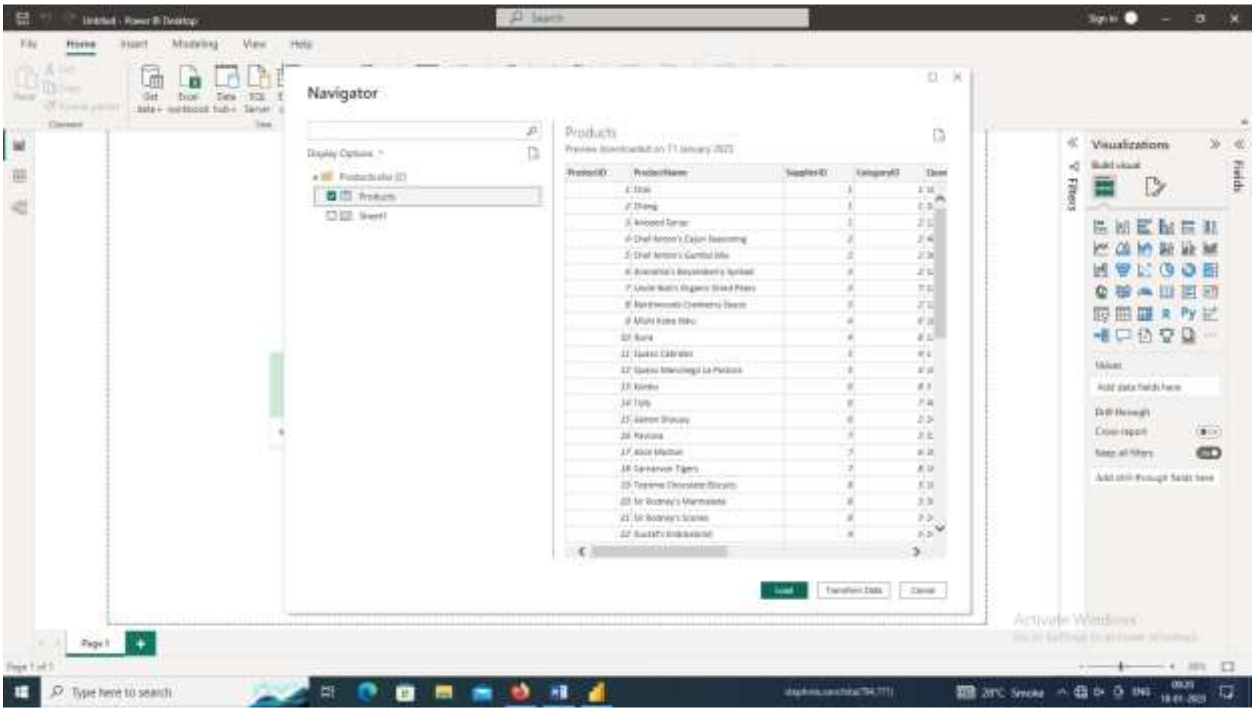


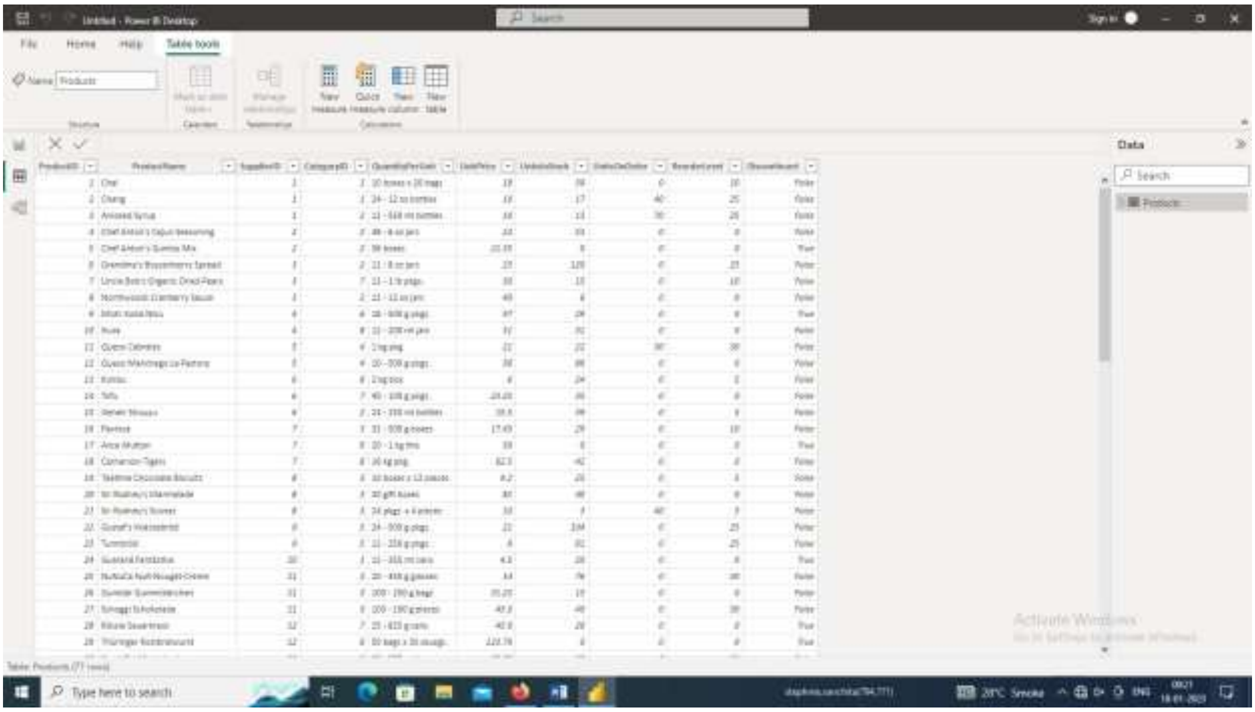
Step 4 - In the Open File dialog box, select the Products.xlsx file.



Name	Date modified	Type	Size
Last week (2)			
Products	13-01-2023 22:25	Microsoft Excel W...	23 KB
2022_soft	12-01-2023 22:56	File folder	
Earlier this month (1)			
.vs	02-01-2023 21:43	File folder	
Last month (1)			
soft_0922	14-12-2022 02:33	File folder	
A long time ago (2)			
Teaching Plan	27-08-2022 00:01	Microsoft Excel W...	14 KB
mysql-connector-java-5.1.23-bin.jar	09-09-2022 01:27	File folder	

Step 5 - select the Products table and then select load



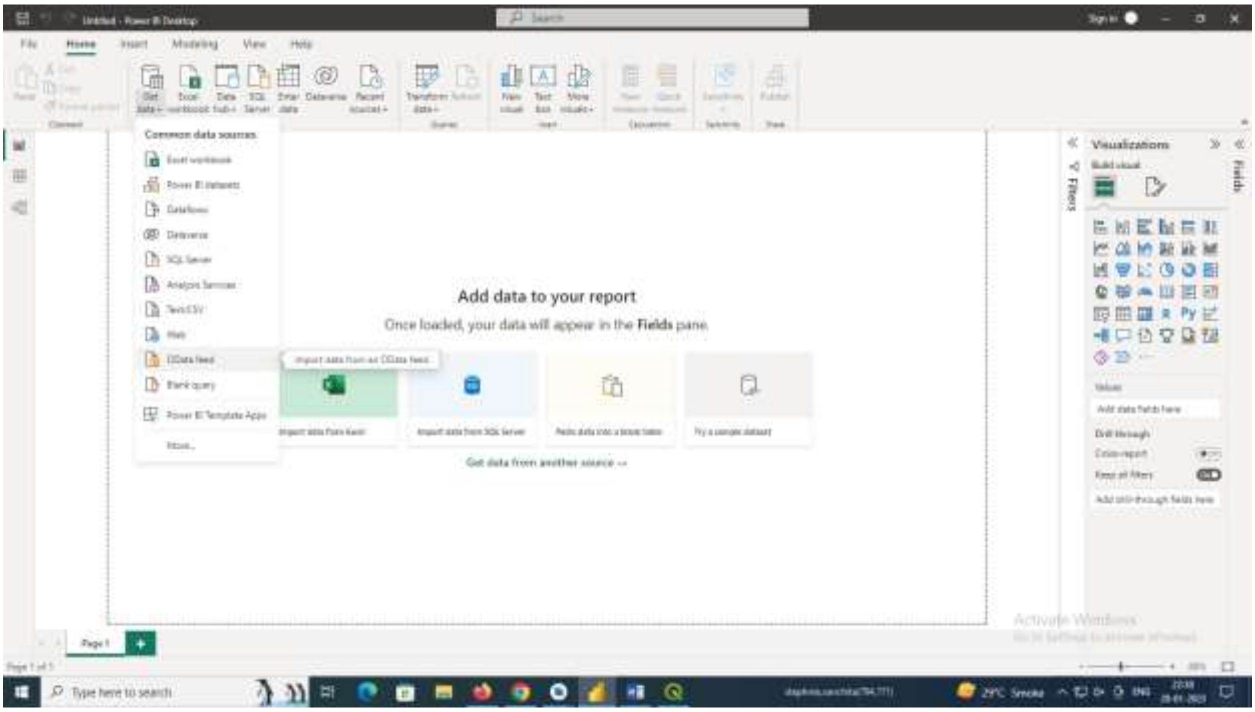


Import odata feed.

Connect to an OData feed:

1) From the Home ribbon tab in Query Editor, select Get Data.

2) Browse to the OData Feed data source.



Add data to your report

Once loaded, your data will appear in the **Fields** pane.

Import data from Excel

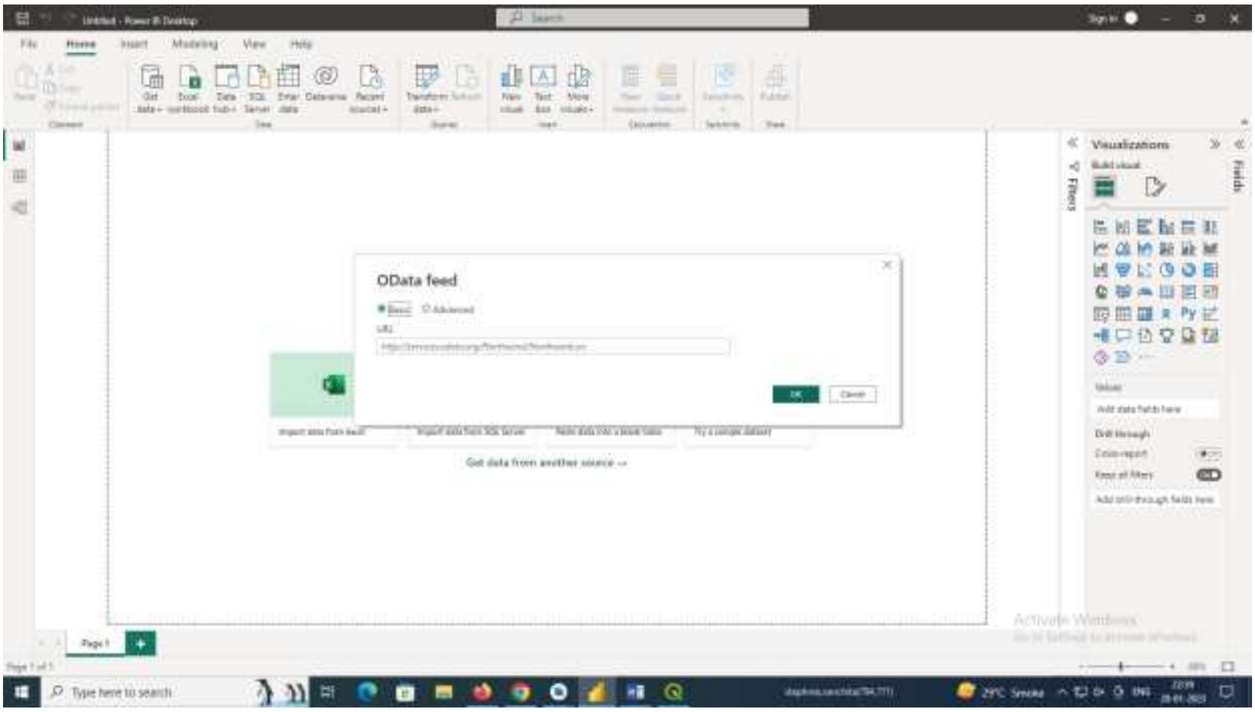
Import data from SQL Server

Paste data into a blank table

Try a sample dataset

Get data from another source →

3) In the OData Feed dialog box, paste the URL for the Northwind ODatafeed.
4) Select OK.



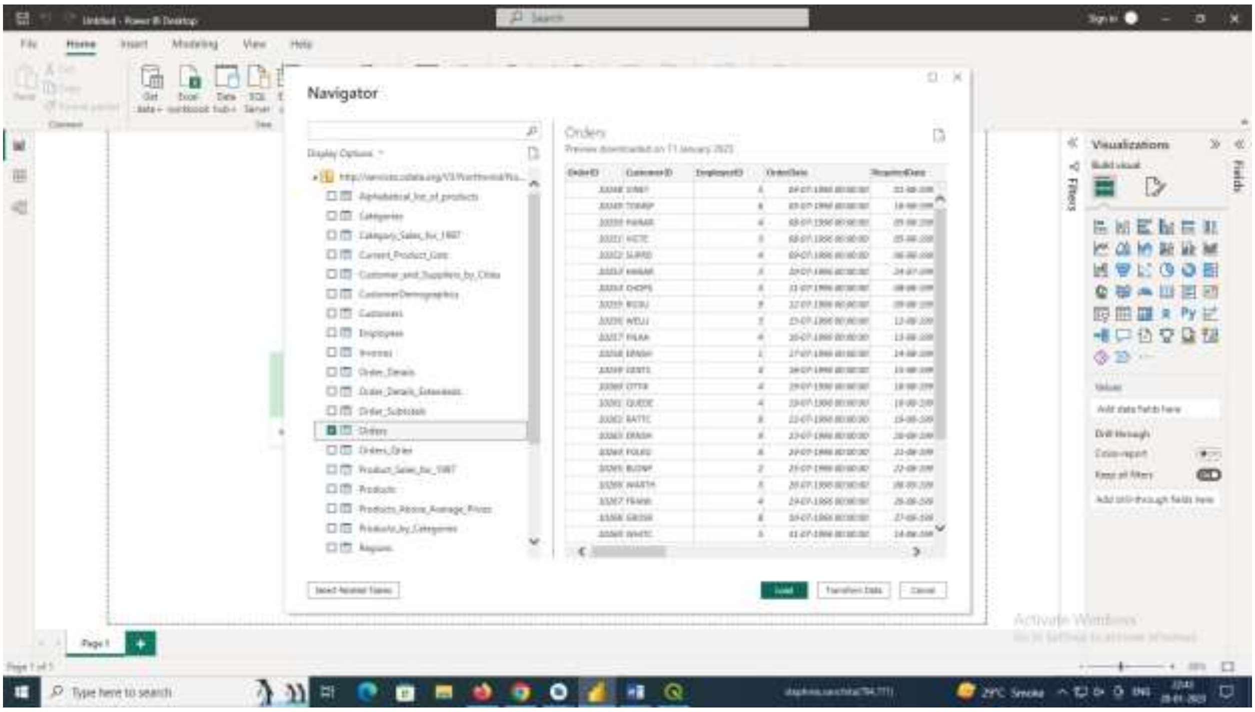
OData feed

● Basic ○ Advanced

URL

http://services.odata.org/Northwind/Northwind.svc

5) In the Navigator pane, select the Orders table, and then select Edit.



Navigator

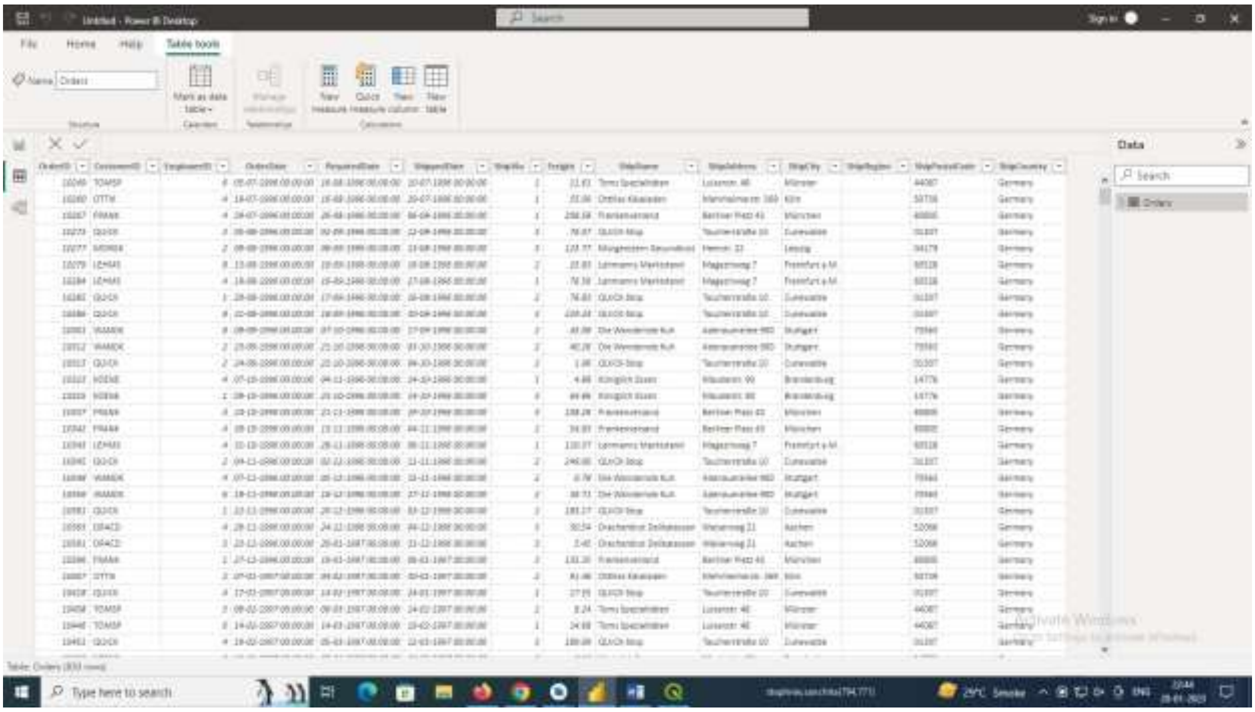
Display Options

- http://services.odata.org/V3/Northwind/No...
  - ☐ Alphabetical_list_of_products
  - ☐ Categories
  - ☐ Category_Sales_for_1997
  - ☐ Current_Product_Lists
  - ☐ Customer_and_Suppliers_by_Cities
  - ☐ CustomerDemographics
  - ☐ Customers
  - ☐ Employees
  - ☐ Invoices
  - ☐ Order_Details
  - ☐ Order_Details_Extendeds
  - ☐ Order_Subtotals
  - ☑ Orders
  - ☐ Orders_Qries
  - ☐ Product_Sales_for_1997
  - ☐ Products
  - ☐ Products_Above_Average_Prices
  - ☐ Products_by_Categories
  - ☐ Regions

Orders

Preview downloaded on 11 January 2023

OrderID	CustomerID	EmployeeID	OrderDate	RequiredDate



Name: Orders

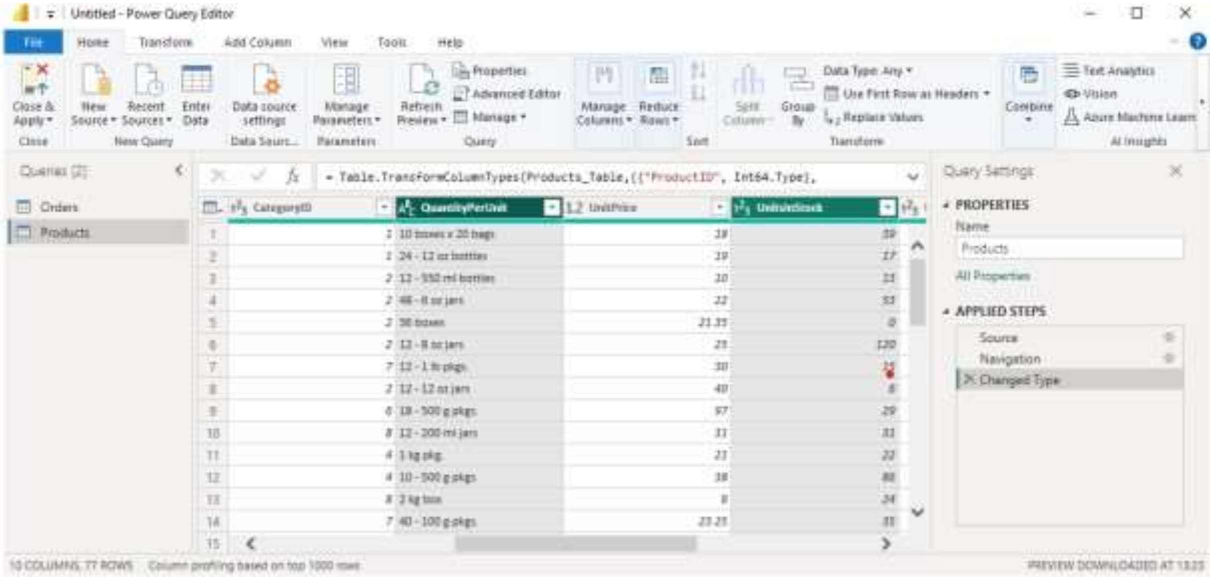
OrderID	CustomerID	EmployeeID	OrderDate	RequiredDate	ShippedDate	ShipVia	Freight	ShipName	ShipAddress	ShipCity	ShipRegion	ShipPostalCode	ShipCountry

Practical 2: Perform the Extraction Transformation and Loading (ETL) process to construct the database in the Power BI.

ETL Process in Power BI

1) Remove other columns to only display columns of interest In this step you remove all columns except ProductID, ProductName, UnitsInStock, and QuantityPerUnit

Step 1 - In Query Editor, select the ProductID, ProductName, QuantityPerUnit, and UnitsInStock columns (use Ctrl+Click to select more than one column, or Shift+Click to select columns that are beside each other).



```
= Table.TransformColumnTypes(Products_Table,{{"ProductID", Int64.Type},
```

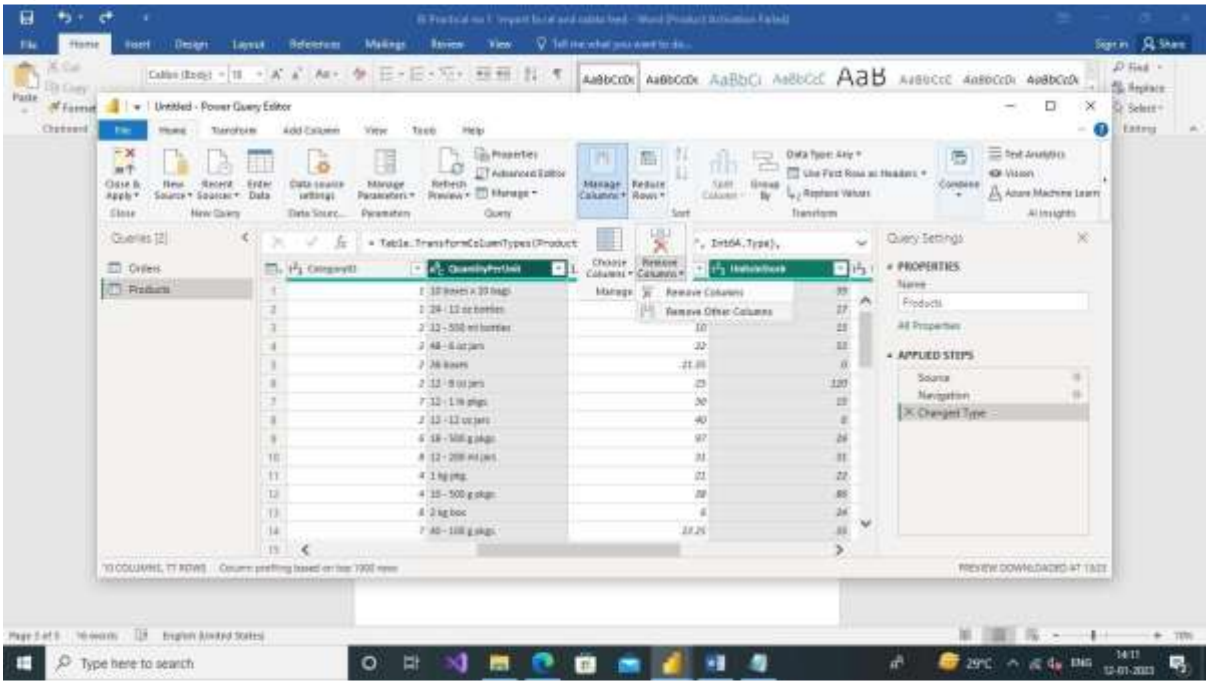
	CategoryID	QuantityPerUnit	UnitPrice	UnitsInStock
1	1	10 boxes x 20 bags	18	39
2	1	24 - 12 oz bottles	19	17
3	2	12 - 550 ml bottles	10	13
4	2	48 - 6 oz jars	22	53
5	2	36 boxes	21.35	0
6	2	12 - 8 oz jars	25	120
7	7	12 - 1 lb pkgs.	30	15
8	2	12 - 12 oz jars	40	6
9	6	18 - 500 g pkgs.	97	29
10	8	12 - 200 ml jars	31	31
11	4	1 kg pkg.	21	22
12	4	10 - 500 g pkgs.	38	86
13	8	2 kg box	6	24
14	7	40 - 100 g pkgs.	23.25	35

PROPERTIES
Name
Products
All Properties

APPLIED STEPS
Source
Navigation
Changed Type

10 COLUMNS, 77 ROWS   Column profiling based on top 1000 rows   PREVIEW DOWNLOADED AT 13:23

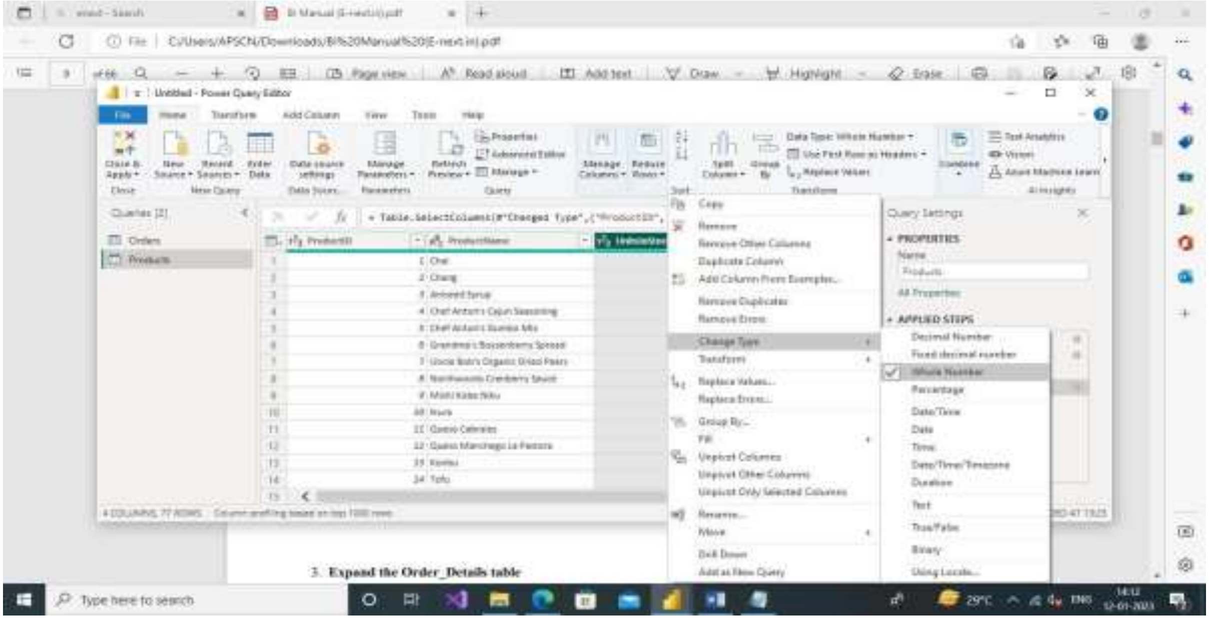
Step 2 - Select Remove Columns > Remove Other Columns from the ribbon, or right-click on a column header and click Remove Other Columns



Change the data type of the UnitsInStock column

1. Select the UnitsInStock column.
2. Select the Data Type drop-down button in the Home ribbon.
3. If not already a Whole Number, select Whole Number for data type from the drop down

(the Data Type: button also displays the data type for the current selection).



Expand the Order_Details table

Step 1 -In the Query View, scroll to the Order_Details column.

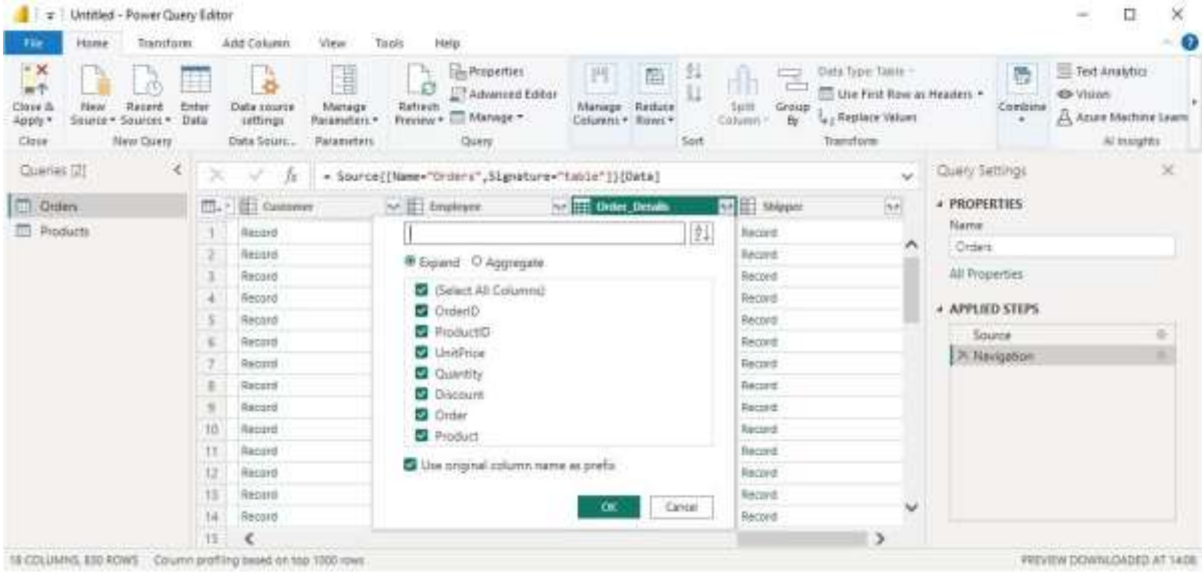
Step 2 -In the Order_Details column, select the expand icon ( ).

Step 3 -In the Expand drop-down:

a. Select (Select All Columns) to clear all columns.

b. Select ProductID, UnitPrice, and Quantity.

c. Click OK.



Untitled - Power Query Editor
File Home Transform Add Column View Tools Help
Close & Apply New Source Recent Sources Enter Data Data source settings Manage Parameters Refresh Preview Properties Advanced Editor Manage Manage Columns Reduce Rows Sort Split Column Group By Data Type: Table Use First Row as Headers Replace Values Combine Text Analytics Vision Azure Machine Learning
Queries [2] Orders Products
Customer Employee Order_Details Shipper
Query Settings PROPERTIES Name Orders All Properties APPLIED STEPS Source Navigation

```
= Source{[Name="Orders",Signature="table"]}[Data]
```

● Expand ○ Aggregate

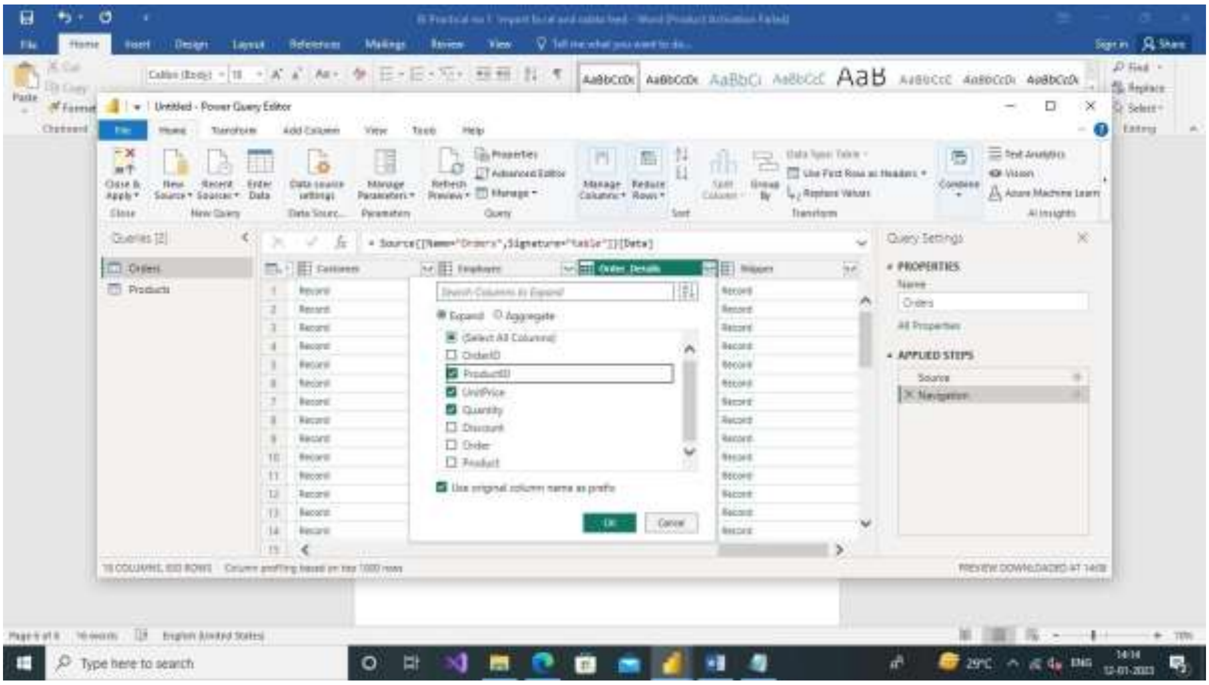
☑ (Select All Columns)
☑ OrderID
☑ ProductID
☑ UnitPrice
☑ Quantity
☑ Discount
☑ Order
☑ Product

☑ Use original column name as prefix

OK Cancel

18 COLUMNS, 830 ROWS Column profiling based on top 1000 rows

PREVIEW DOWNLOADED AT 14:08



Untitled - Power Query Editor
File Home Transform Add Column View Tools Help
Queries [2] Orders Products
Customer Employee Order_Details Shipper
Query Settings PROPERTIES Name Orders All Properties APPLIED STEPS Source Navigation
Type here to search

```
= Source{[Name="Orders",Signature="table"]}[Data]
```

Search Columns to Expand

● Expand ○ Aggregate

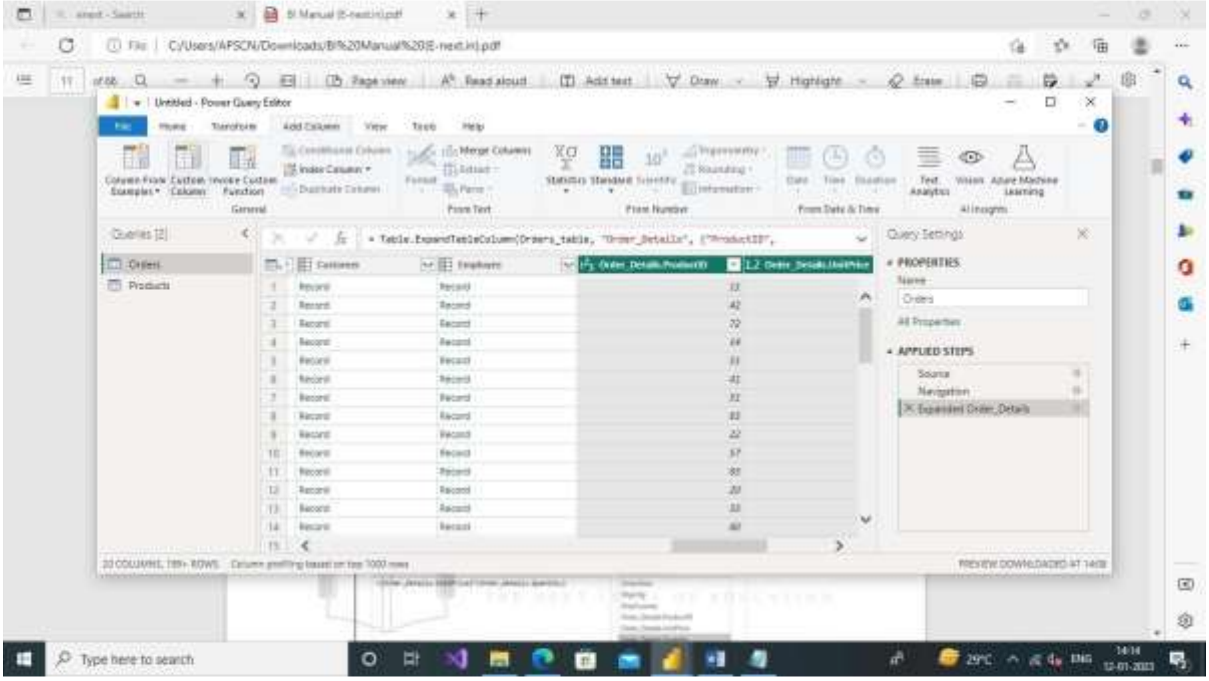
▣ (Select All Columns)
☐ OrderID
☑ ProductID
☑ UnitPrice
☑ Quantity
☐ Discount
☐ Order
☐ Product

☑ Use original column name as prefix

OK Cancel

18 COLUMNS, 830 ROWS Column profiling based on top 1000 rows

PREVIEW DOWNLOADED AT 14:08



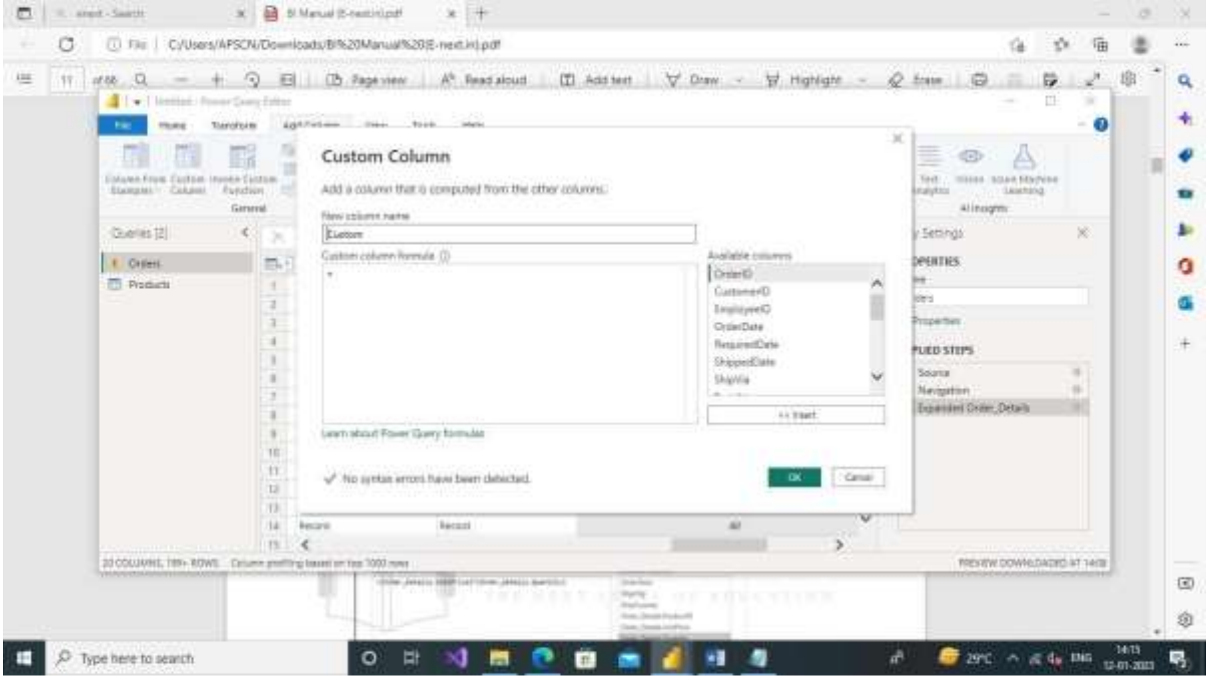
= Table.ExpandTableColumn(Orders_table, "Order_Details", {"ProductID",

	Customers	Employees	Order_Details.ProductID	Order_Details.UnitPrice
1	Record	Record	11	
2	Record	Record	42	
3	Record	Record	72	
4	Record	Record	14	
5	Record	Record	51	
6	Record	Record	41	
7	Record	Record	51	
8	Record	Record	65	
9	Record	Record	22	
10	Record	Record	57	
11	Record	Record	65	
12	Record	Record	20	
13	Record	Record	33	
14	Record	Record	60	

20 COLUMNS, 199+ ROWS Column profiling based on top 1000 rows

Calculate the line total for each Order_Details row

Step 1 - In the Add Column ribbon tab, click Add Custom Column.


Untitled - Power Query Editor
Available columns
<< Insert
OK
Cancel
Learn about Power Query formulas

Custom Column

Add a column that is computed from the other columns.

New column name

Custom

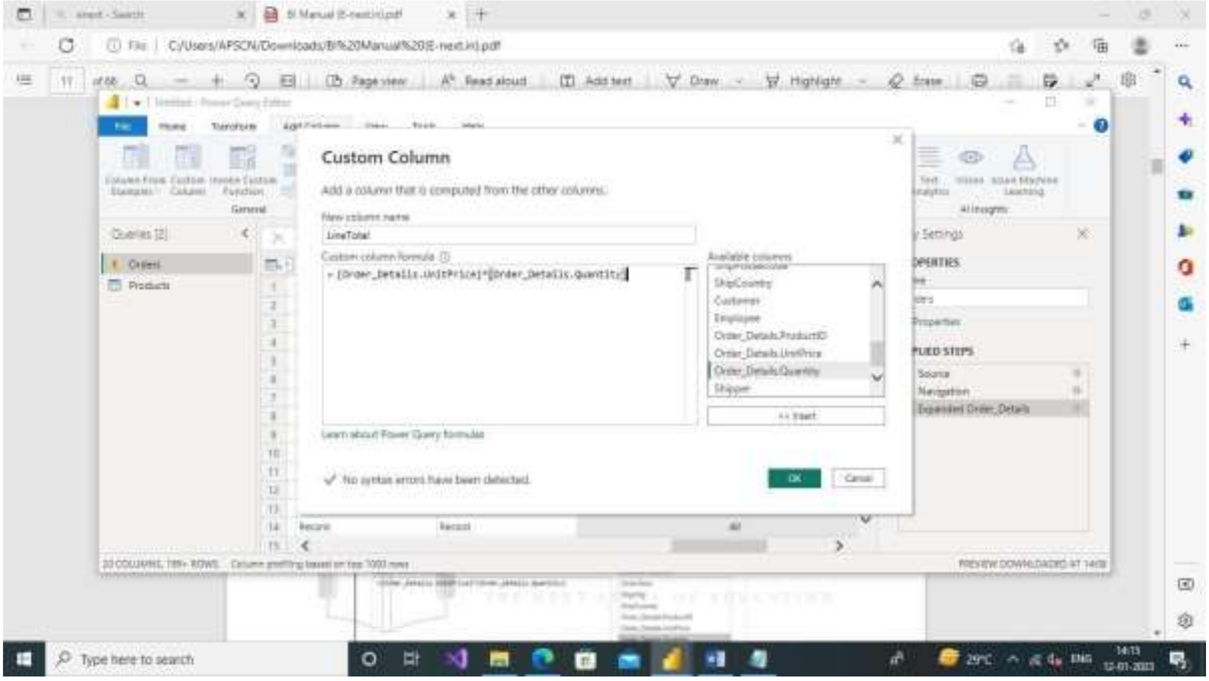
Custom column formula

=

OrderID
CustomerID
EmployeeID
OrderDate
RequiredDate
ShippedDate
ShipVia

✓ No syntax errors have been detected.

Step 2 – In the Add Custom Column dialog box, in the Custom Column Formula textbox, enter [order_Details.UnitPrice]*[Order_Details.Quantity].



Custom Column

Add a column that is computed from the other columns.

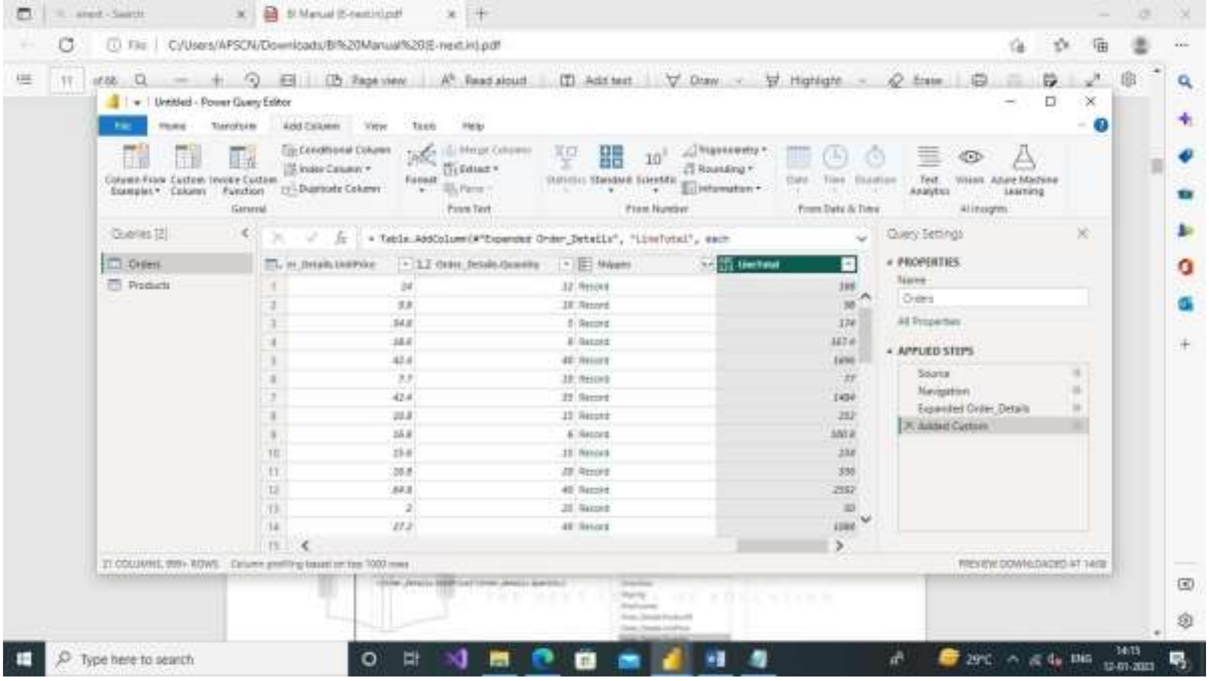
New column name: LineTotal

Custom column formula:

```
= [Order_Details.UnitPrice]*[Order_Details.Quantity]
```

Available columns: ShipCountry, Customer, Employee, Order_Details.ProductID, Order_Details.UnitPrice, Order_Details.Quantity, Shipper

✓ No syntax errors have been detected.

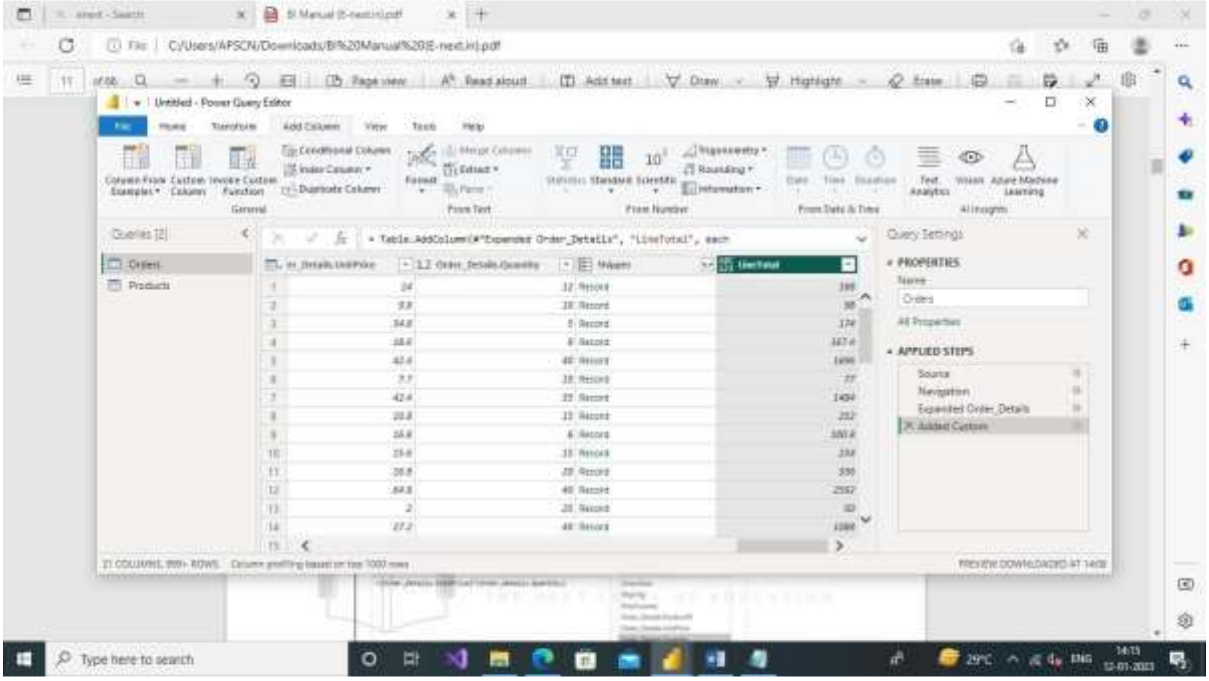


```
= Table.AddColumn(#"Expanded Order_Details", "LineTotal", each
```

	Order_Details.UnitPrice	Order_Details.Quantity	Shipper	LineTotal
1	14	12	Record	168
2	9.8	10	Record	98
3	34.8	5	Record	174
4	18.6	9	Record	167.4
5	42.4	40	Record	1696
6	7.7	10	Record	77
7	42.4	35	Record	1484
8	16.8	15	Record	252
9	16.8	6	Record	100.8
10	15.6	15	Record	234
11	16.8	20	Record	336
12	64.8	40	Record	2592
13	2	25	Record	50
14	27.2	40	Record	1088

Step 3 – In the new column name textbox, enter lineTotal

Step 4 – Click ok.



```
= Table.AddColumn(#"Expanded Order_Details", "LineTotal", each
```

	...er_Details.UnitPrice	1.2 Order_Details.Quantity	Shippers	LineTotal
1	14	12	Record	168
2	9.8	10	Record	98
3	34.8	5	Record	174
4	18.6	9	Record	167.4
5	42.4	40	Record	1696
6	7.7	10	Record	77
7	42.4	35	Record	1484
8	16.8	15	Record	252
9	16.8	6	Record	100.8
10	15.6	15	Record	234
11	16.8	20	Record	336
12	64.8	40	Record	2592
13	2	25	Record	50
14	27.2	40	Record	1088

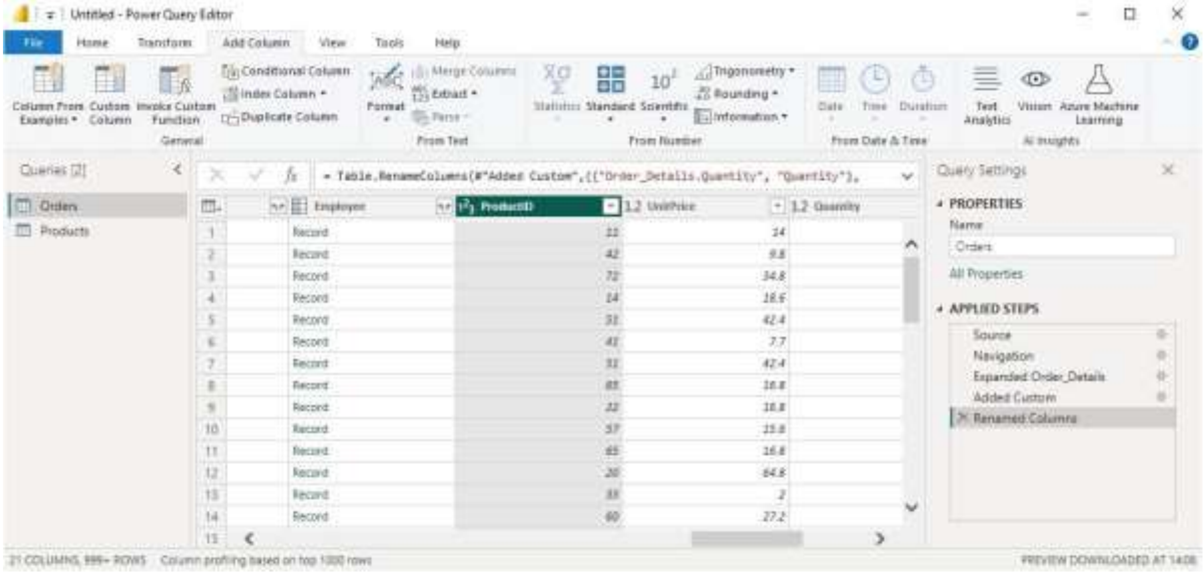
Query Settings: Name: Orders. Applied Steps: Source, Navigation, Expanded Order_Details, Added Custom

21 COLUMNS, 999+ ROWS   Column profiling based on top 1000 rows   PREVIEW DOWNLOADED AT 14:08

Combine the Products and Total Sales queries

Step 1: Confirm the relationship between Products and Total Sales

1. First, we need to load the model that we created in Query Editor into Power BI Desktop. From the Home ribbon of Query Editor, select Close & Load



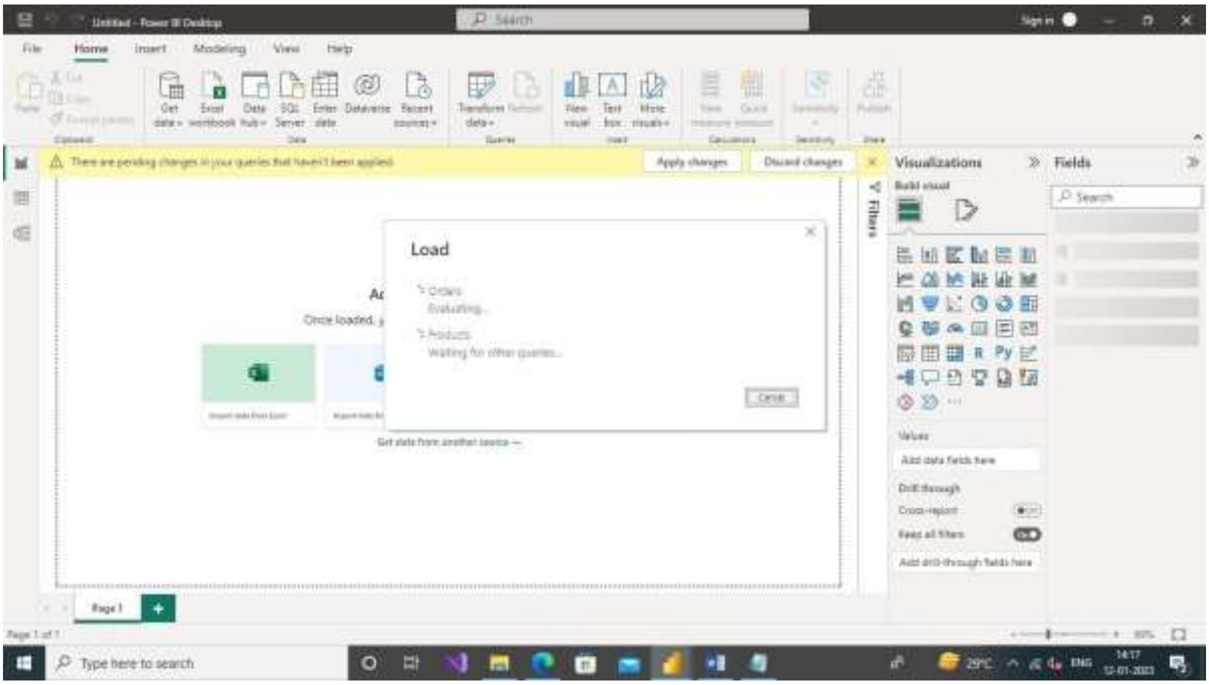
```
= Table.RenameColumns(#"Added Custom",{{"Order_Details.Quantity", "Quantity"},
```

	Employee	ProductID	1.2 UnitPrice	1.2 Quantity
1	Record	11	14	
2	Record	42	9.8	
3	Record	72	34.8	
4	Record	14	18.6	
5	Record	51	42.4	
6	Record	41	7.7	
7	Record	51	42.4	
8	Record	65	16.8	
9	Record	22	16.8	
10	Record	57	15.6	
11	Record	65	16.8	
12	Record	20	64.8	
13	Record	33	2	
14	Record	60	27.2	

Query Settings: Name: Orders. Applied Steps: Source, Navigation, Expanded Order_Details, Added Custom, Renamed Columns

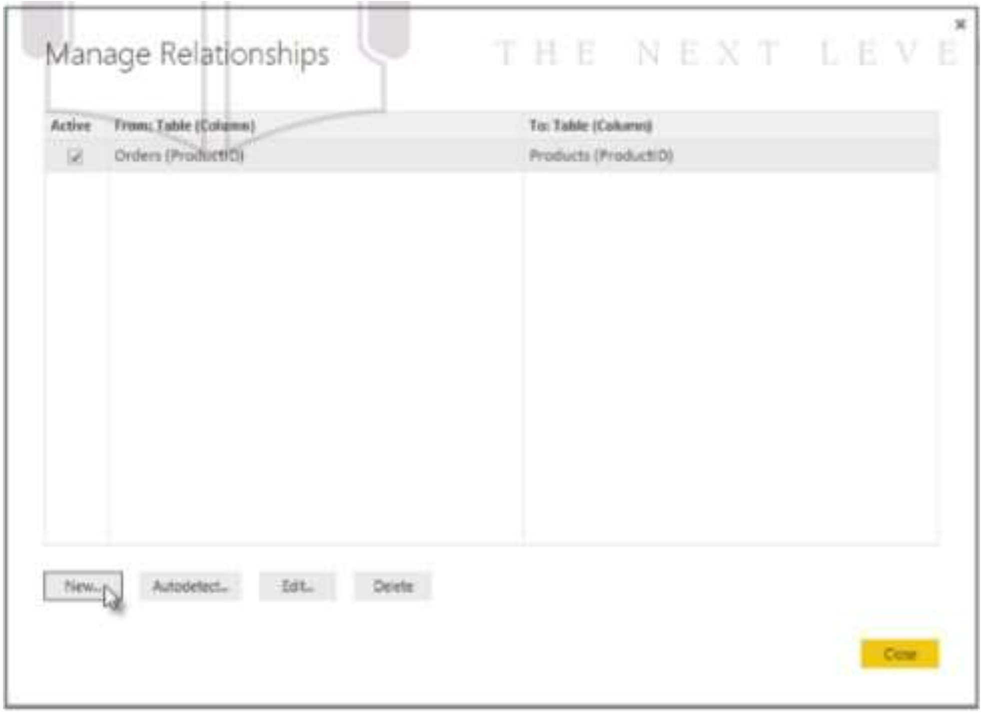
21 COLUMNS, 999+ ROWS   Column profiling based on top 1000 rows   PREVIEW DOWNLOADED AT 14:08

2. Power BI Desktop loads the data from the two queries



3. Once the data is loaded, select the Manage Relationships button Home ribbon

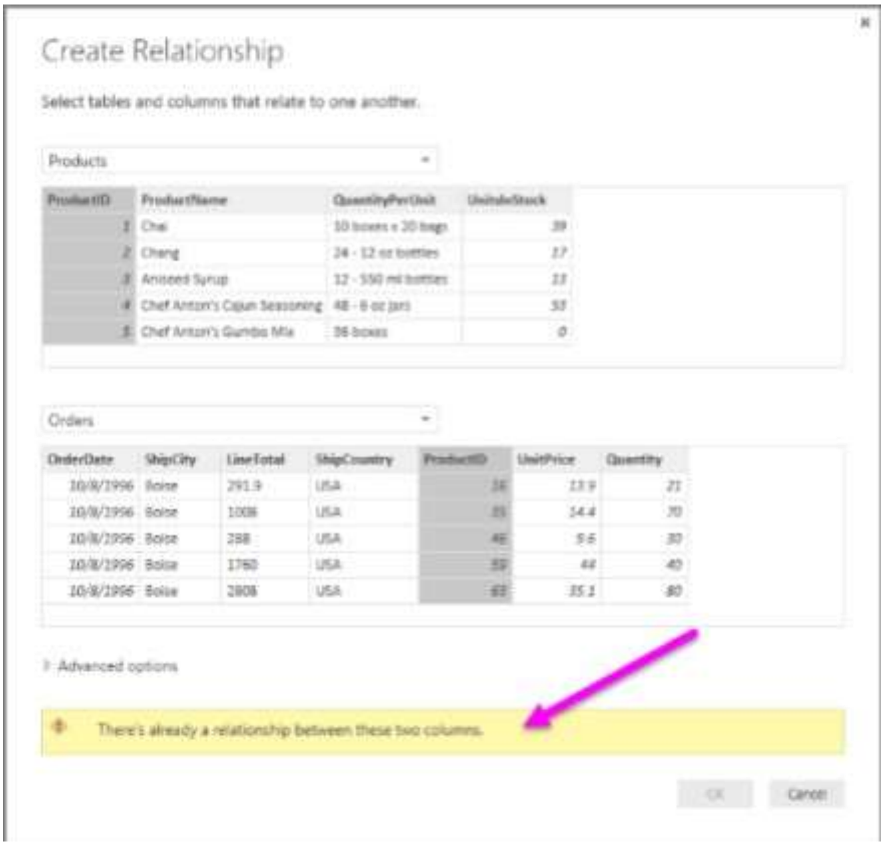
4. Select the new button.



Manage Relationships

Active	From: Table (Column)	To: Table (Column)
☑	Orders (ProductID)	Products (ProductID)

5.When we attempt to create the relationship, we see that one already exists! As shown in the
Create Relationship dialog (by the shaded columns), the ProductsID fields in each query already have an established relationship.



Create Relationship

Select tables and columns that relate to one another.

Products

ProductID	ProductName	QuantityPerUnit	UnitsInStock
1	Chai	10 boxes x 20 bags	39
2	Chang	24 - 12 oz bottles	17
3	Aniseed Syrup	12 - 550 ml bottles	13
4	Chef Anton's Cajun Seasoning	48 - 6 oz jars	53
5	Chef Anton's Gumbo Mix	36 boxes	0

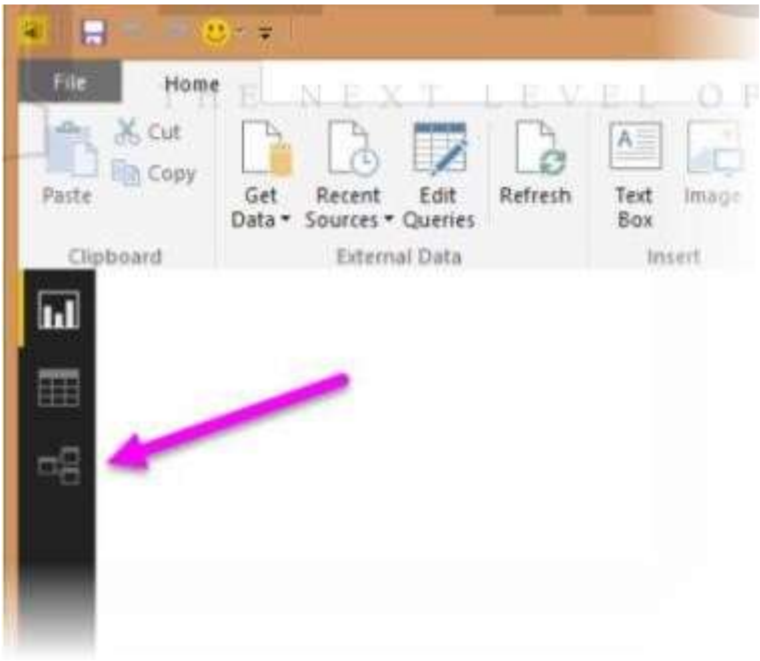
Orders

OrderDate	ShipCity	LineTotal	ShipCountry	ProductID	UnitPrice	Quantity
10/8/1996	Boise	291.9	USA	16	13.9	21
10/8/1996	Boise	1008	USA	35	14.4	70
10/8/1996	Boise	288	USA	46	9.6	30
10/8/1996	Boise	1760	USA	59	44	40
10/8/1996	Boise	2808	USA	63	35.1	80

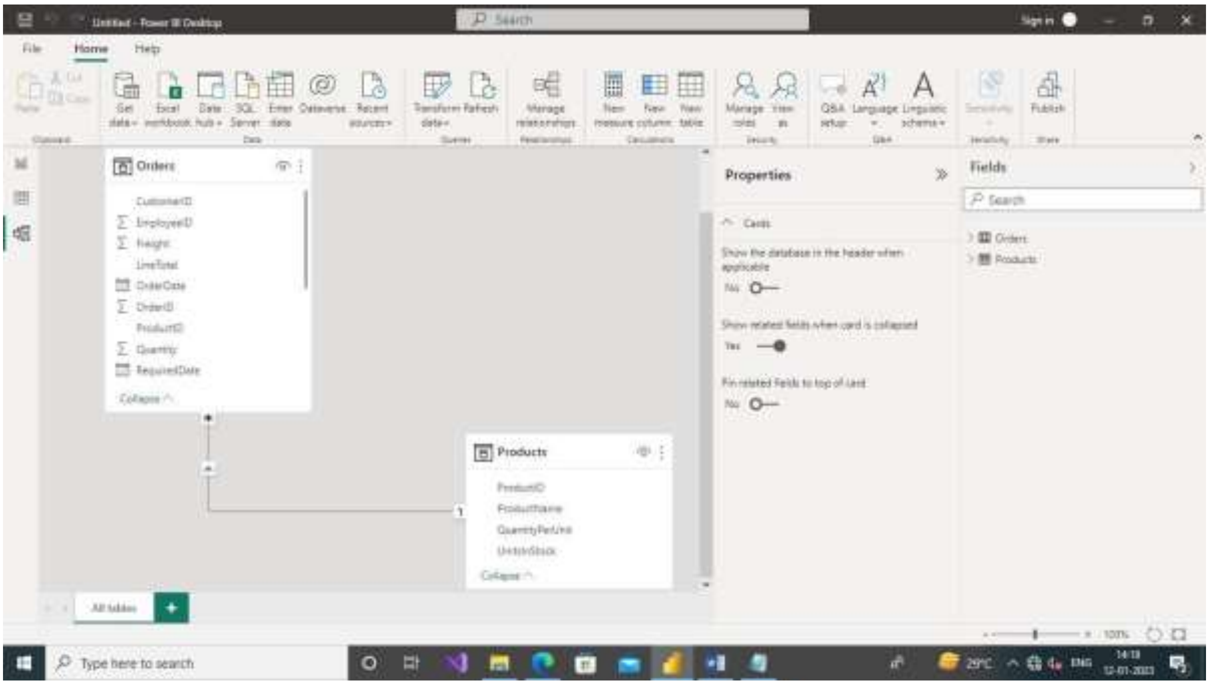
▷ Advanced options

There's already a relationship between these two columns.

5. Select the cancel, and then select relationship view in power BI Desktop



6. We see the following, which visualizes the relationship between the queries



Orders

- CustomerID
- EmployeeID
- Freight
- LineTotal
- OrderDate
- OrderID
- ProductID
- Quantity
- RequiredDate

Collapse ^

Products

- ProductID
- ProductName
- QuantityPerUnit
- UnitsInStock

Collapse ^

Properties

Cards

Show the database in the header when applicable: No

Show related fields when card is collapsed: Yes

Pin related fields to top of card: No

Fields

Search

- Orders
- Products

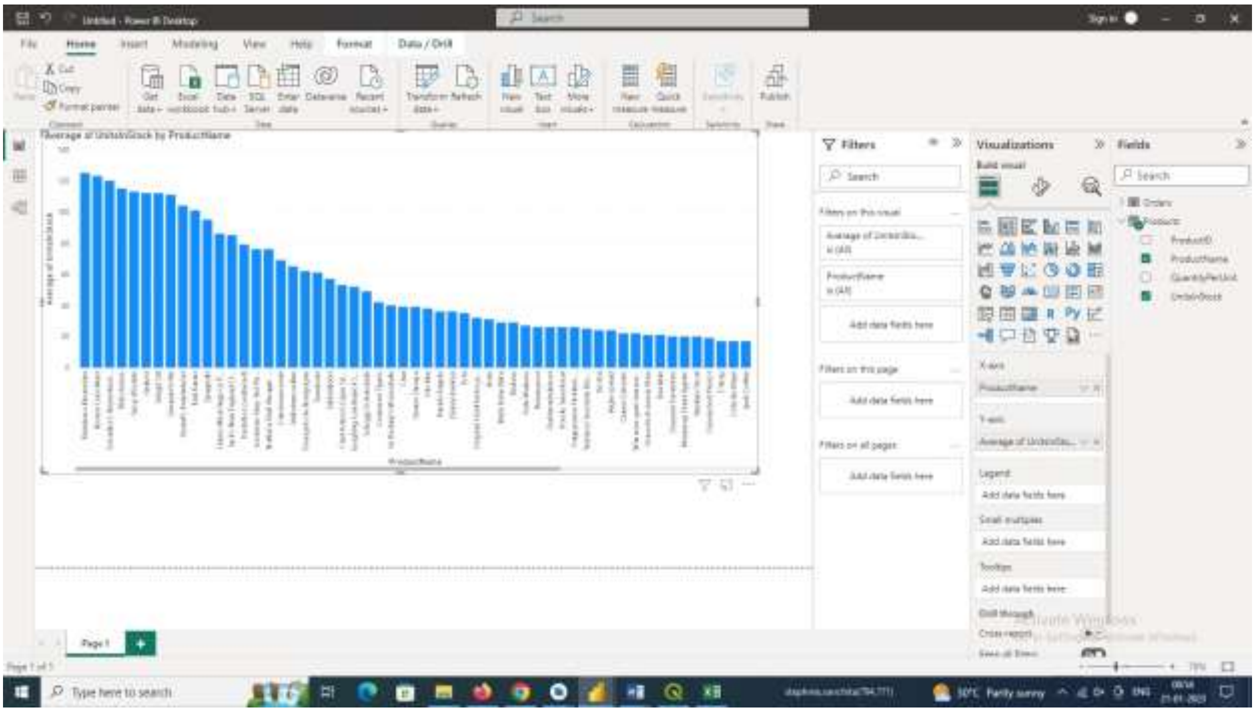
Practical 3: Data Visualization from ETL Process

Step 1: Create charts showing Units in Stock by Product and Total Sales by Year

1 Drag UnitsInStock from the Field pane (the Fields pane is along the right of the screen) onto a blank space on the canvas. A Table visualization is created.

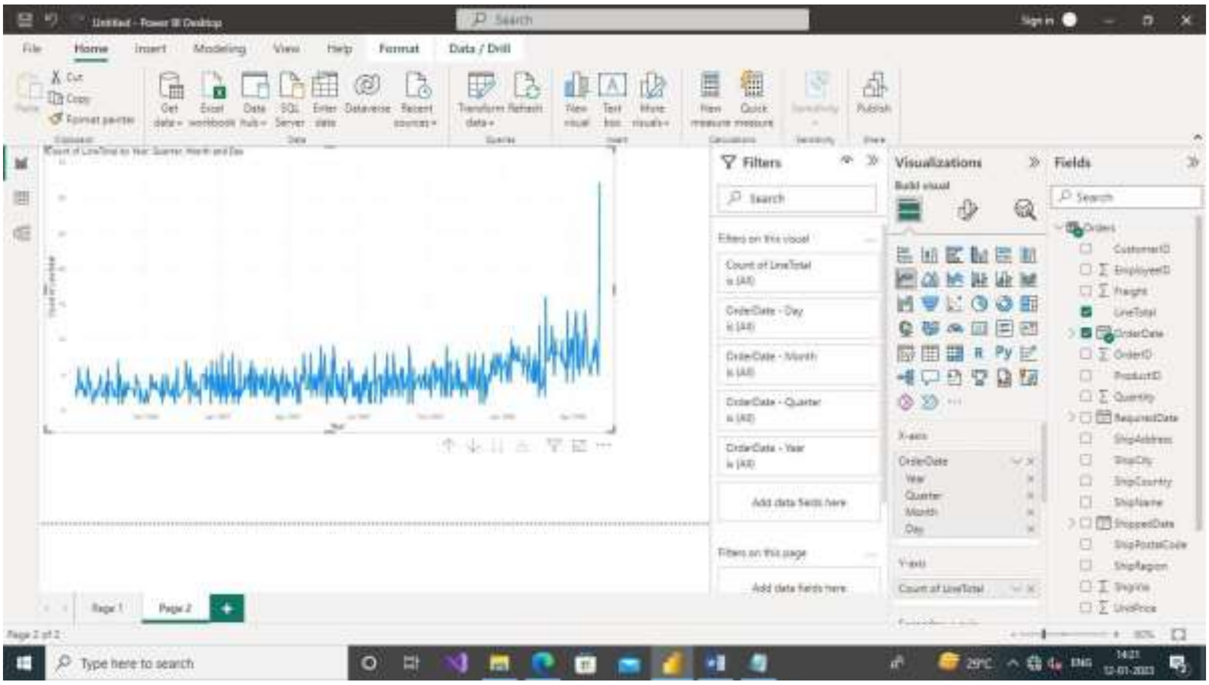
2 Next, drag ProductName to the X Axis box, found in the bottom half of the Visualizations pane.

3 Next, drag average UnitsInStock to the Y Axis box, found in the bottom half of the Visualizations pane.



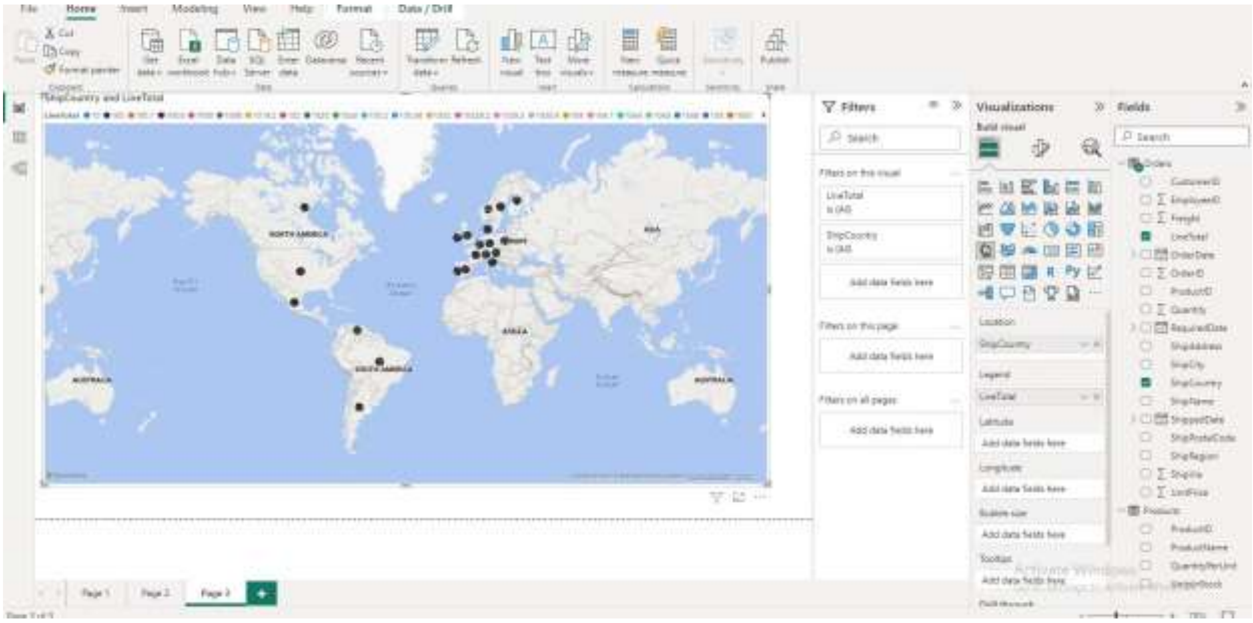
Step 2 :Create line chart

1 Drag OrderDate to the canvas beneath the first chart, then drag LineTotal (again, from the Fields pane) onto the visual, then select Line Chart. The following visualization is created.



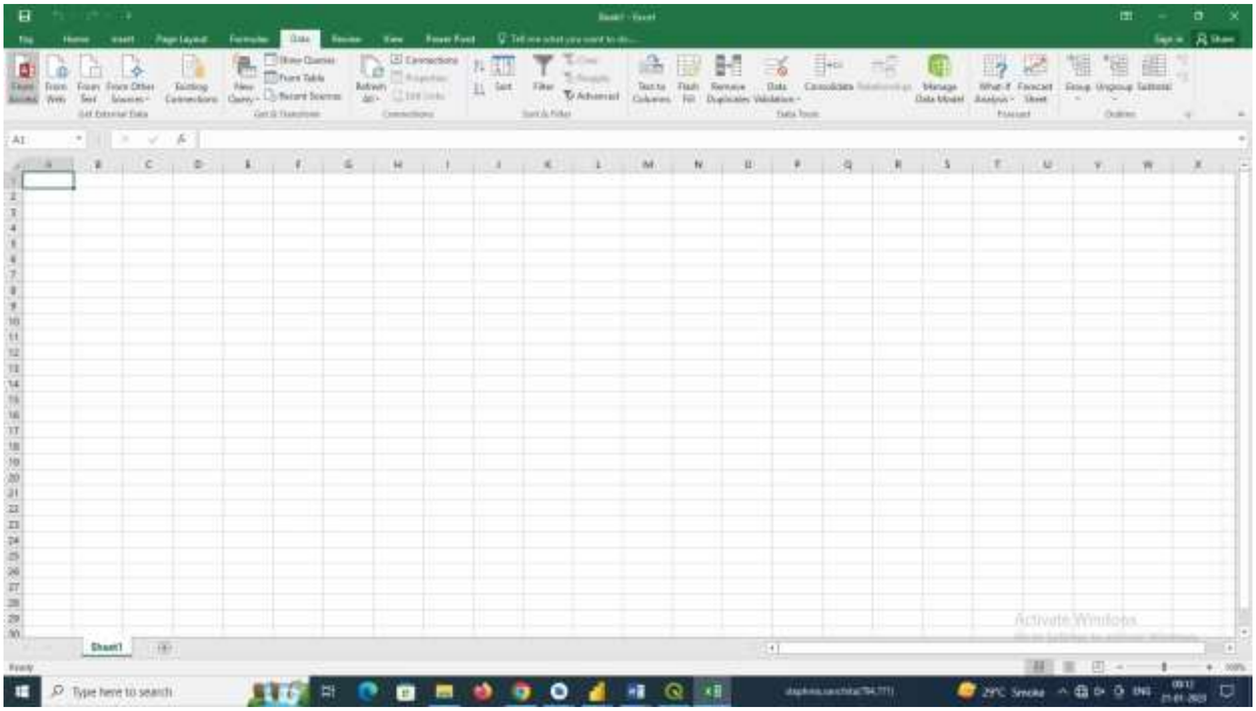
Step 3 :Create Map

1 Drag Ship Country to location, then drag LineTotal (again, from the Fields pane) onto the legend then The following visualization is created.

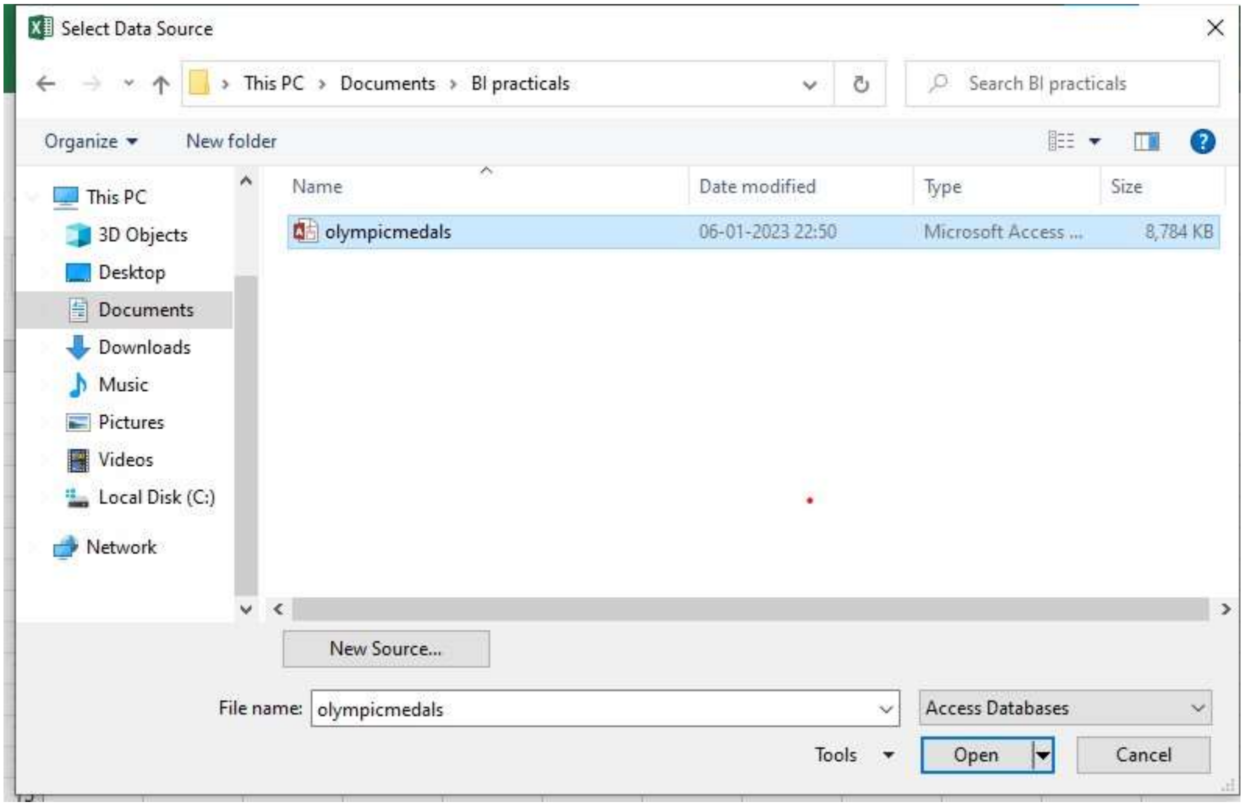


Practical 4 : Import data warehouse data in Microsoft Excel and create pivot table and pivot chart

Step 1 – in Excel open blank workbook
Step 2 – click Data -> From Access



Step 3 – select file olympicmedals and open

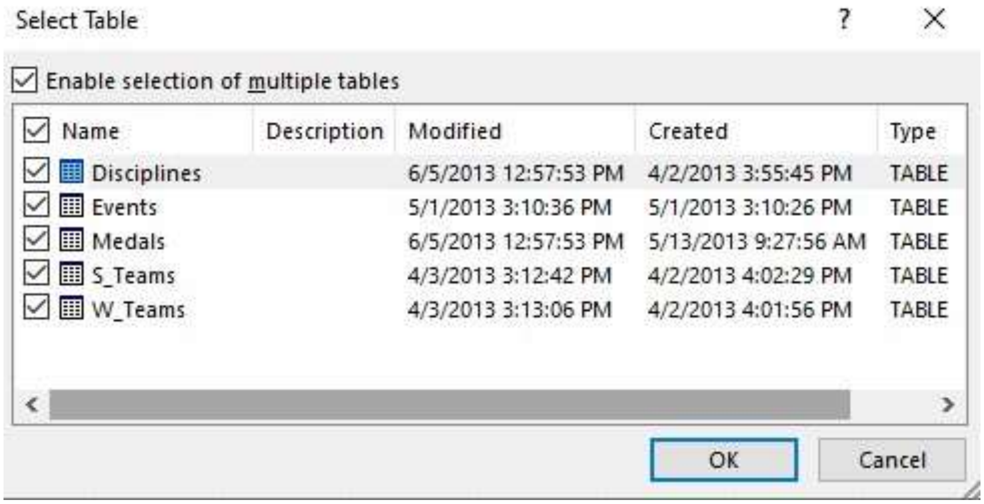


Name	Date modified	Type	Size
olympicmedals	06-01-2023 22:50	Microsoft Access ...	8,784 KB

File name: olympicmedals

Access Databases

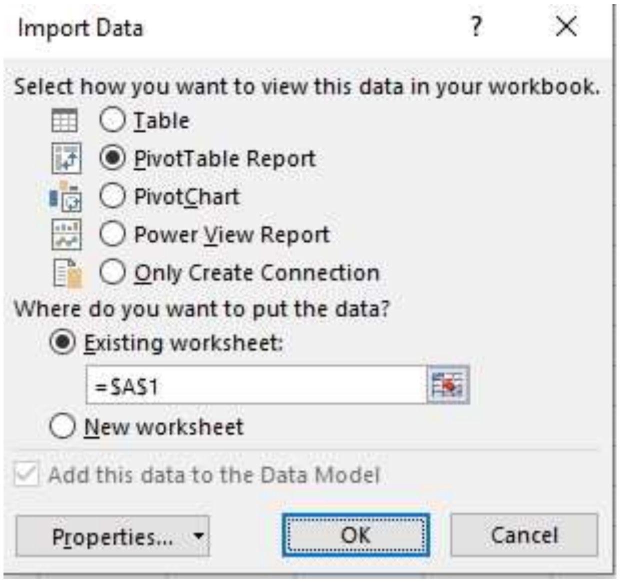
Step 4 – select all columns and click ok



☑ Enable selection of multiple tables

☑ Name	Description	Modified	Created	Type
☑ Disciplines		6/5/2013 12:57:53 PM	4/2/2013 3:55:45 PM	TABLE
☑ Events		5/1/2013 3:10:36 PM	5/1/2013 3:10:26 PM	TABLE
☑ Medals		6/5/2013 12:57:53 PM	5/13/2013 9:27:56 AM	TABLE
☑ S_Teams		4/3/2013 3:12:42 PM	4/2/2013 4:02:29 PM	TABLE
☑ W_Teams		4/3/2013 3:13:06 PM	4/2/2013 4:01:56 PM	TABLE

Step 5- select pivot chat Report and click ok



Import Data

Select how you want to view this data in your workbook.

- ○ Table
- ● PivotTable Report
- ○ PivotChart
- ○ Power View Report
- ○ Only Create Connection

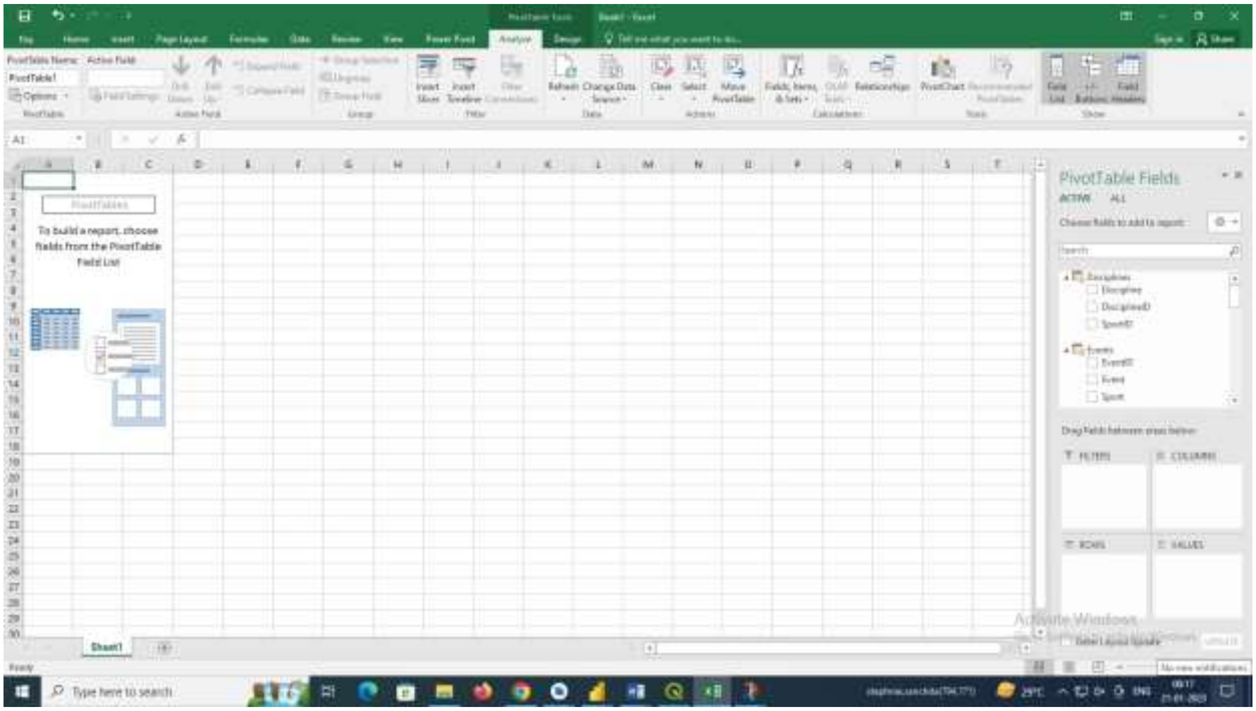
Where do you want to put the data?

- ● Existing worksheet:

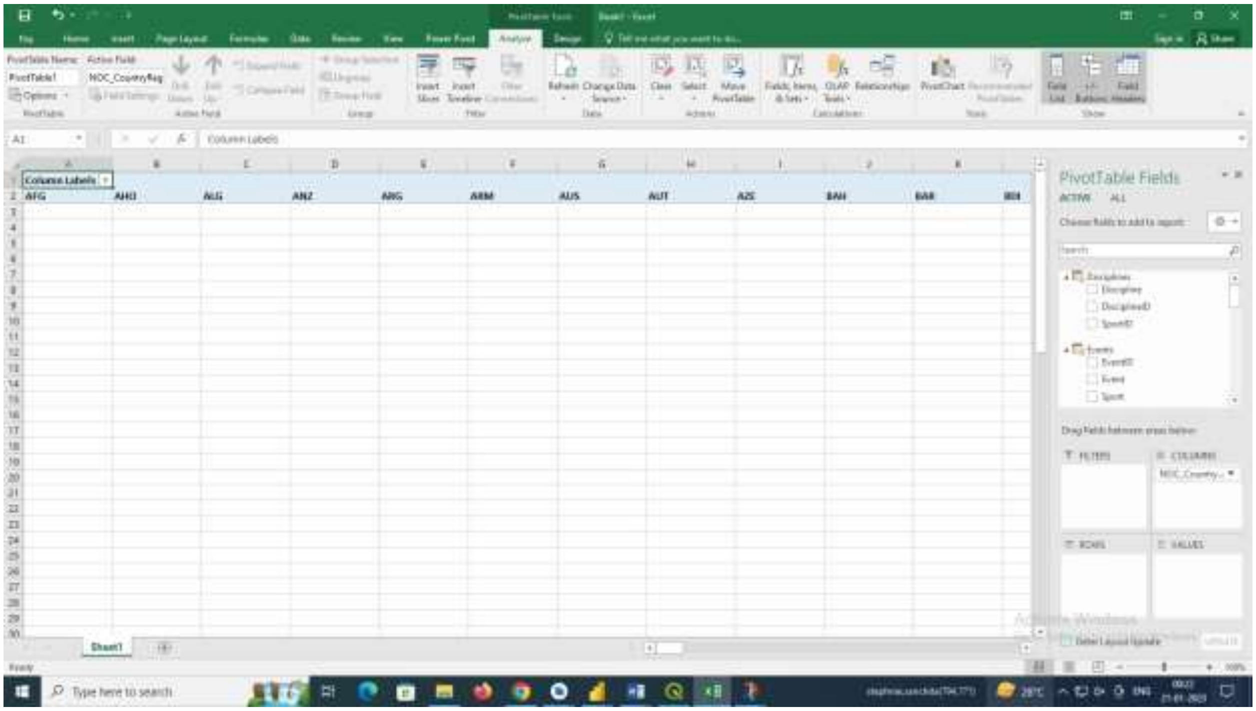
=A1

- ○ New worksheet

☑ Add this data to the Data Model

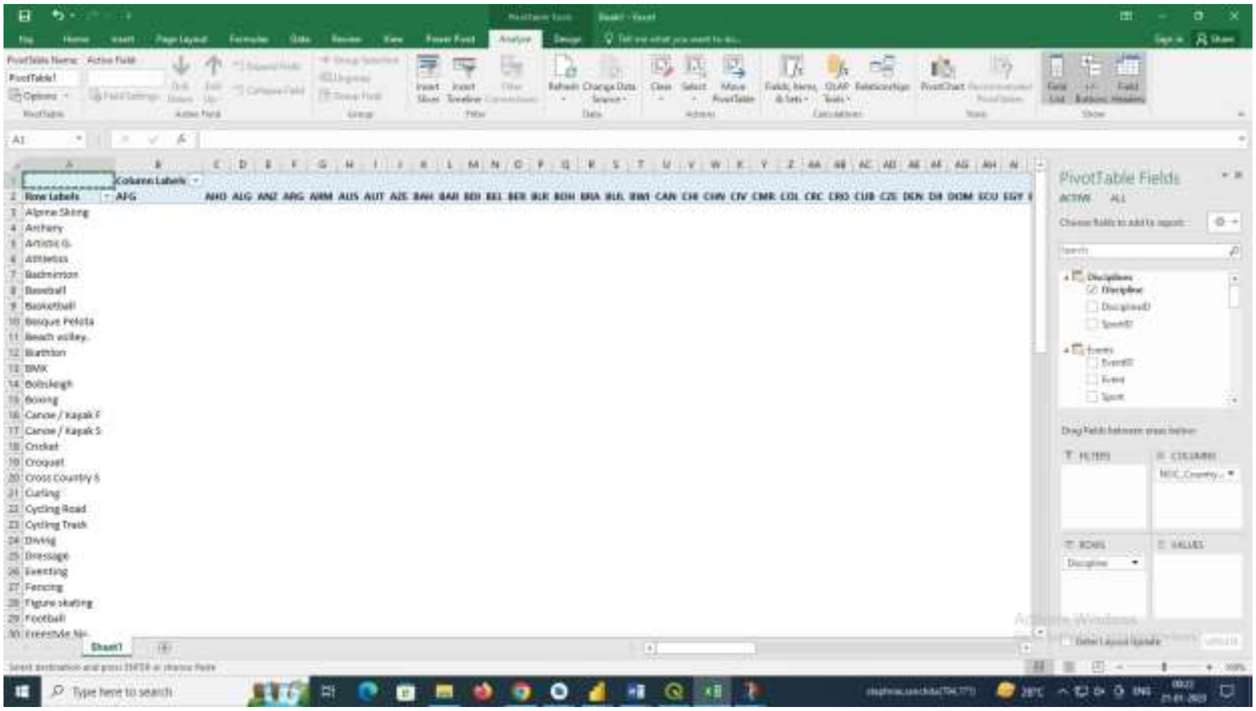


Step 6 – In pivoatTable Fields, expand the medals table .
Find the NOC_CountryRegion field and drag it to the columns area



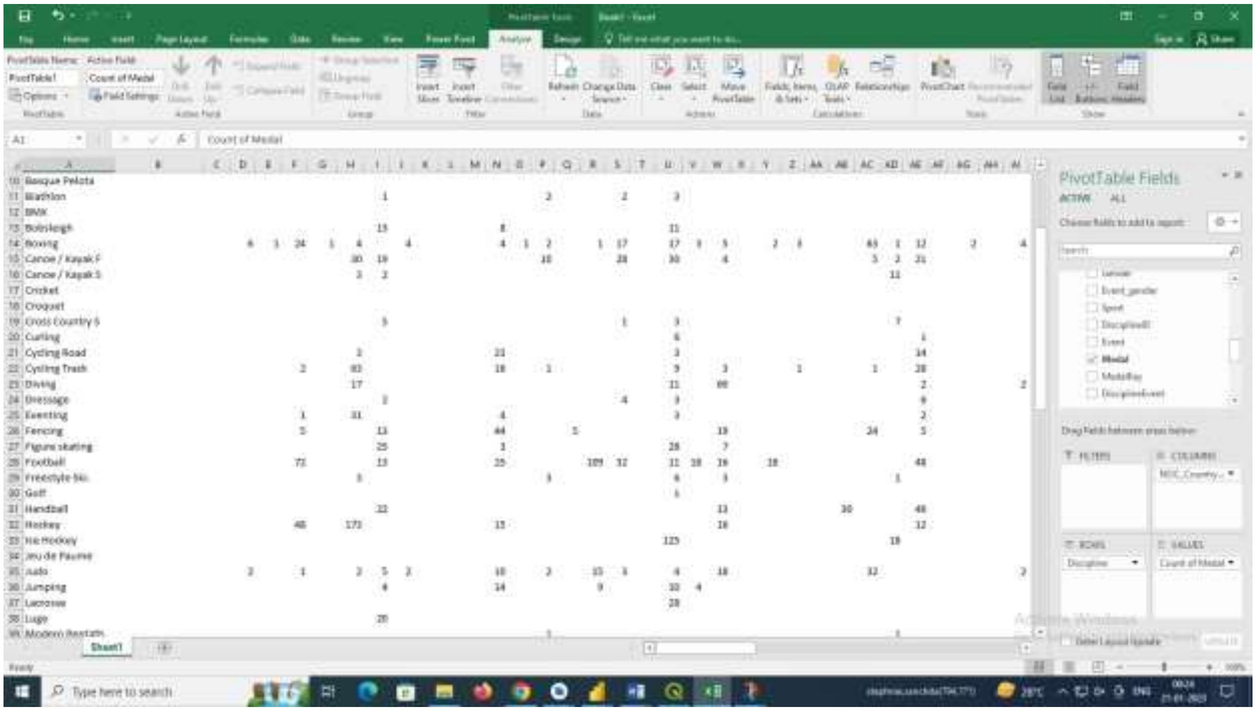
Column Labels											
AFG	AHO	ALG	ANZ	ARG	ARM	AUS	AUT	AZE	BAH	BAR	BDI

Step 7 – from the disciplines table drag to the ROWs area.



	Column Labels
Row Labels	AFG AHO ALG ANZ ARG ARM AUS AUT AZE BAH BAR BDI BEL BER BUR BOH BRA BUL BWI CAN CHI CHN CIV CMR COL CRC CRO CUB CZE DEN DJI DOM ECU EGY
Alpine Skiing	
Archery	
Artistic G.	
Athletics	
Badminton	
Baseball	
Basketball	
Basque Pelota	
Beach volley..	
Biathlon	
BMX	
Bobsleigh	
Boxing	
Canoe / Kayak F	
Canoe / Kayak S	
Cricket	
Croquet	
Cross Country S	
Curling	
Cycling Road	
Cycling Track	
Diving	
Dressage	
Eventing	
Fencing	
Figure skating	
Football	
Freestyle Ski..	

Step 8 – from the Medals table, drag medal to the values area.
Excel automatically changes medal to count of medal.

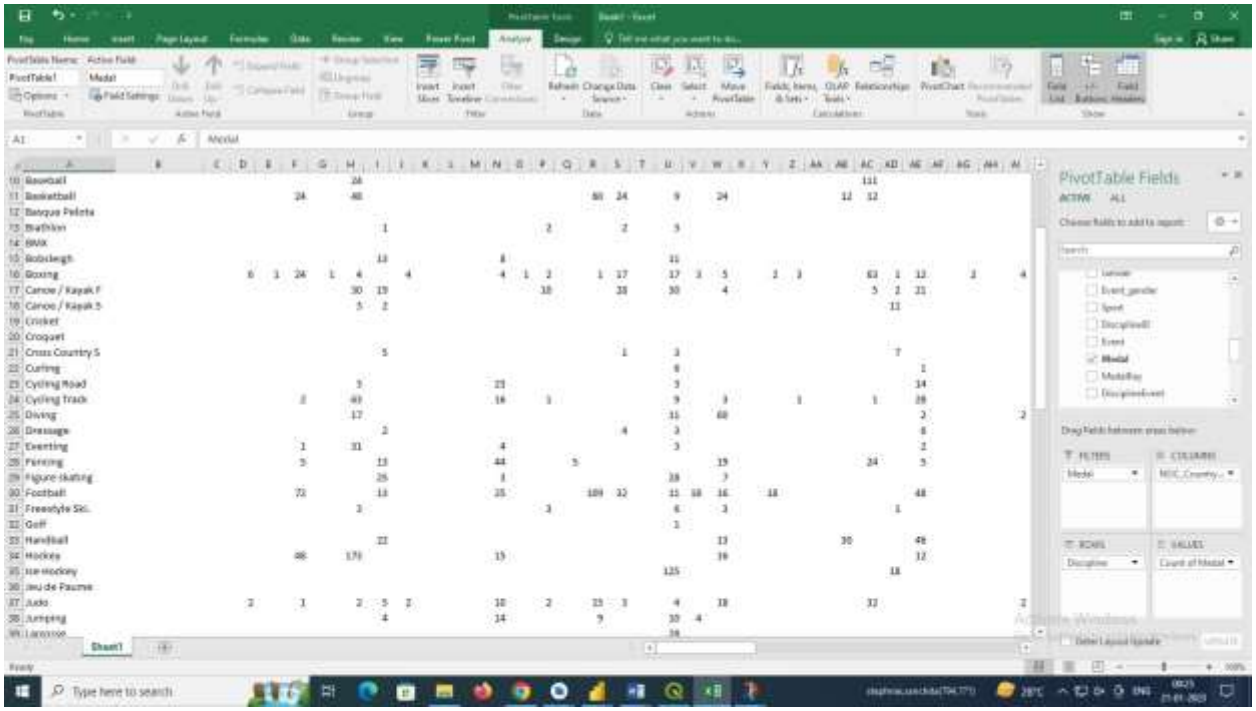


PivotTable Name: PivotTable1
Active Field: Count of Medal

A1 Count of Medal

PivotTable Fields
FILTERS:
COLUMNS: NOC_Country...
ROWS: Discipline
VALUES: Count of Medal

Step 9 - – from the Medals table, drag medal to the FILTERS area.

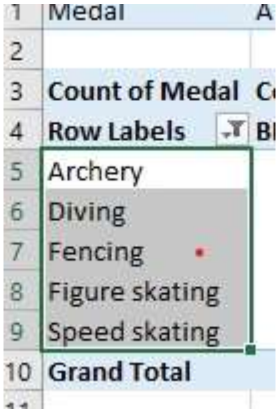


PivotTable Name: PivotTable1
Active Field: Medal

A1 Medal

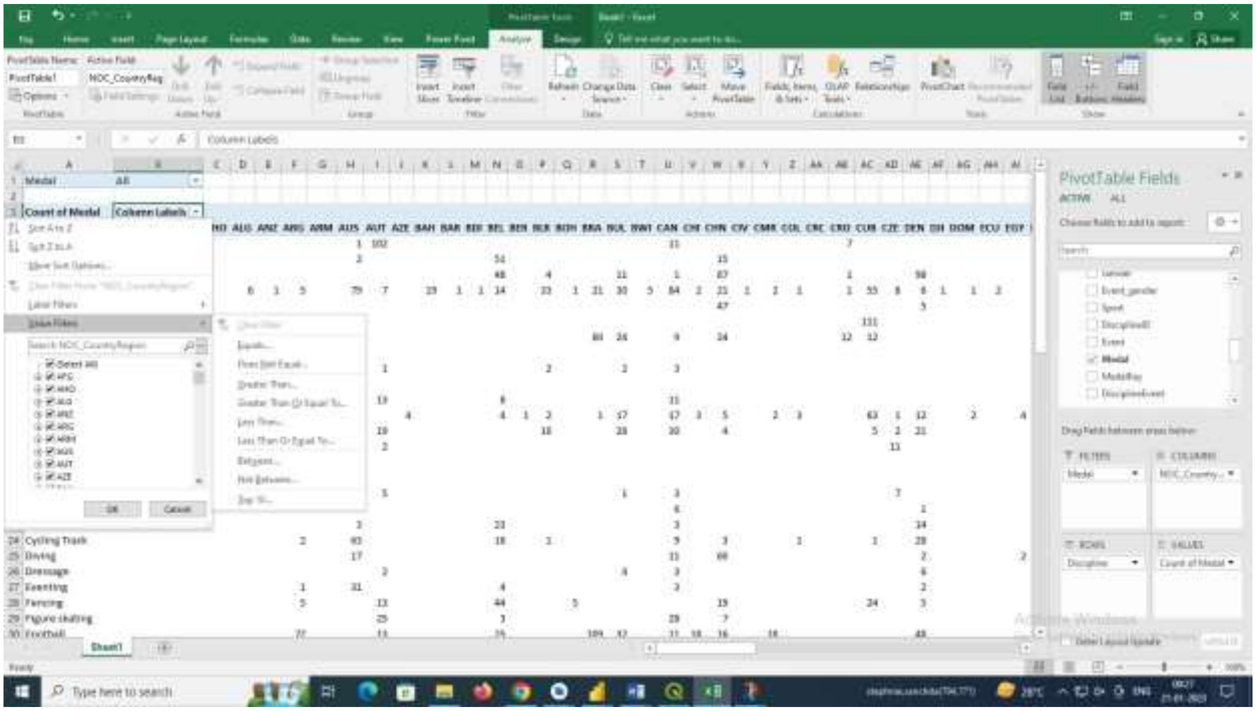
PivotTable Fields
FILTERS: Medal
COLUMNS: NOC_Country...
ROWS: Discipline
VALUES: Count of Medal

Step 10 – select archery, Diving, Fencing, Figure skating, speed skating in Row Labels.

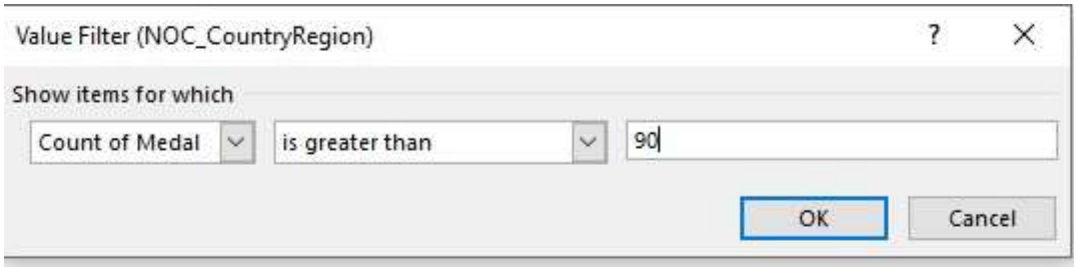


```
1  Medal            A
2
3  Count of Medal   C
4  Row Labels       Bl
5  Archery
6  Diving
7  Fencing
8  Figure skating
9  Speed skating
10 Grand Total
```

Step 11 – In pivotTable , click on the dropdown to the right of column Labels.



Step 12- select values Filters and select Grater Than..

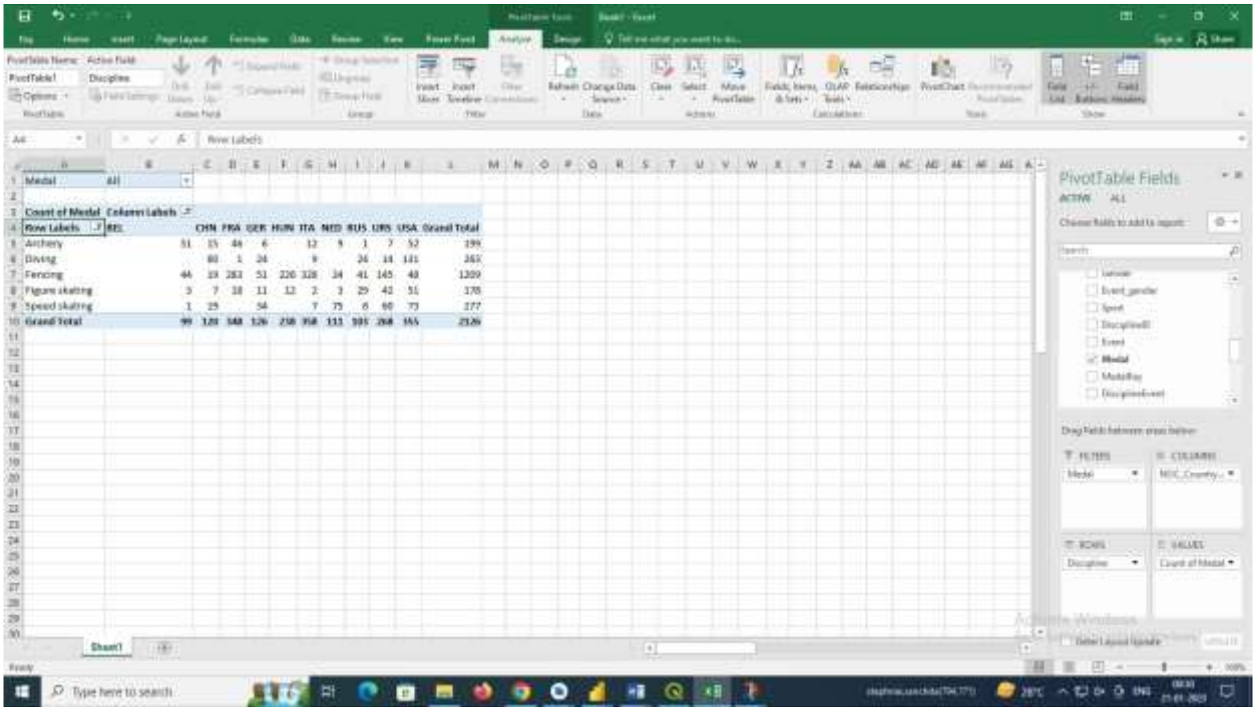


Value Filter (NOC_CountryRegion)

Show items for which

Count of Medal | is greater than | 90

Step 13- type 90 in the last field . click ok

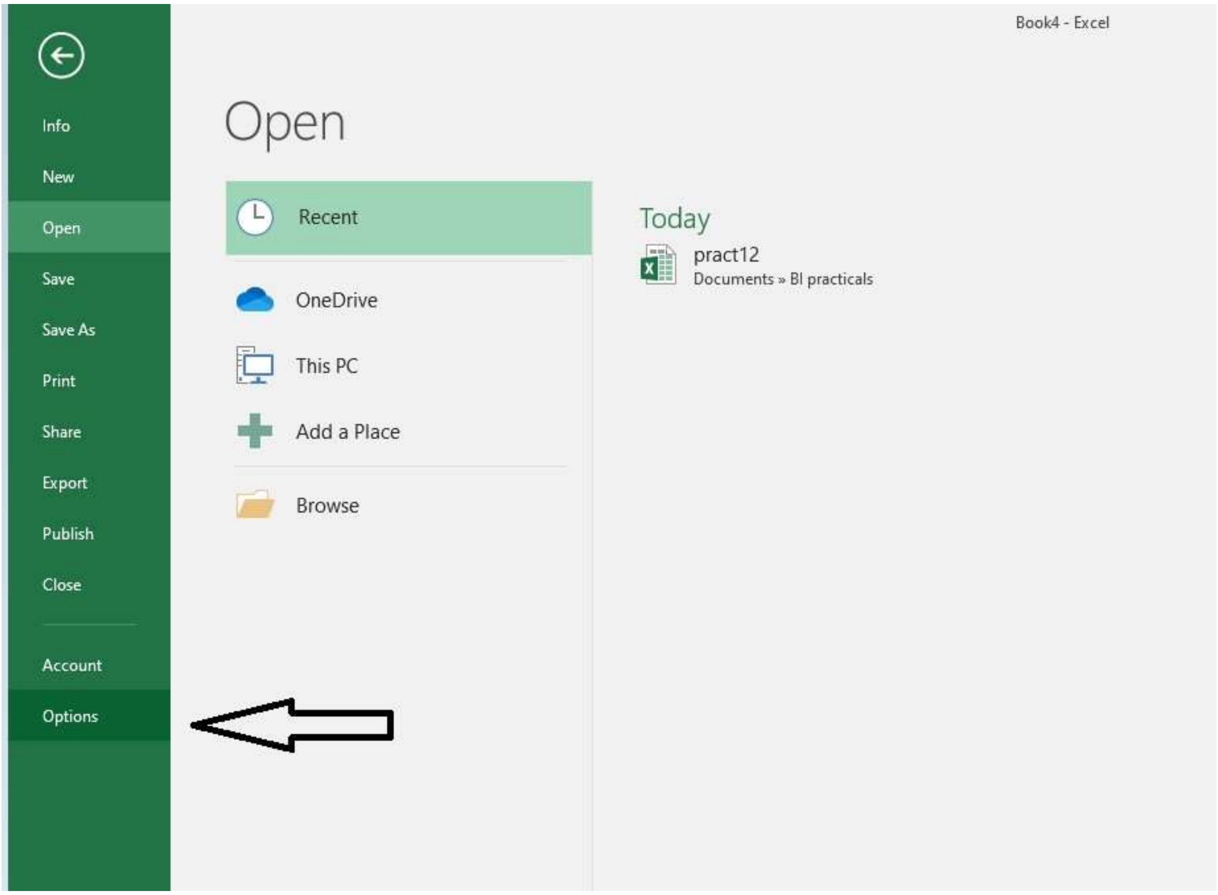


Medal	All

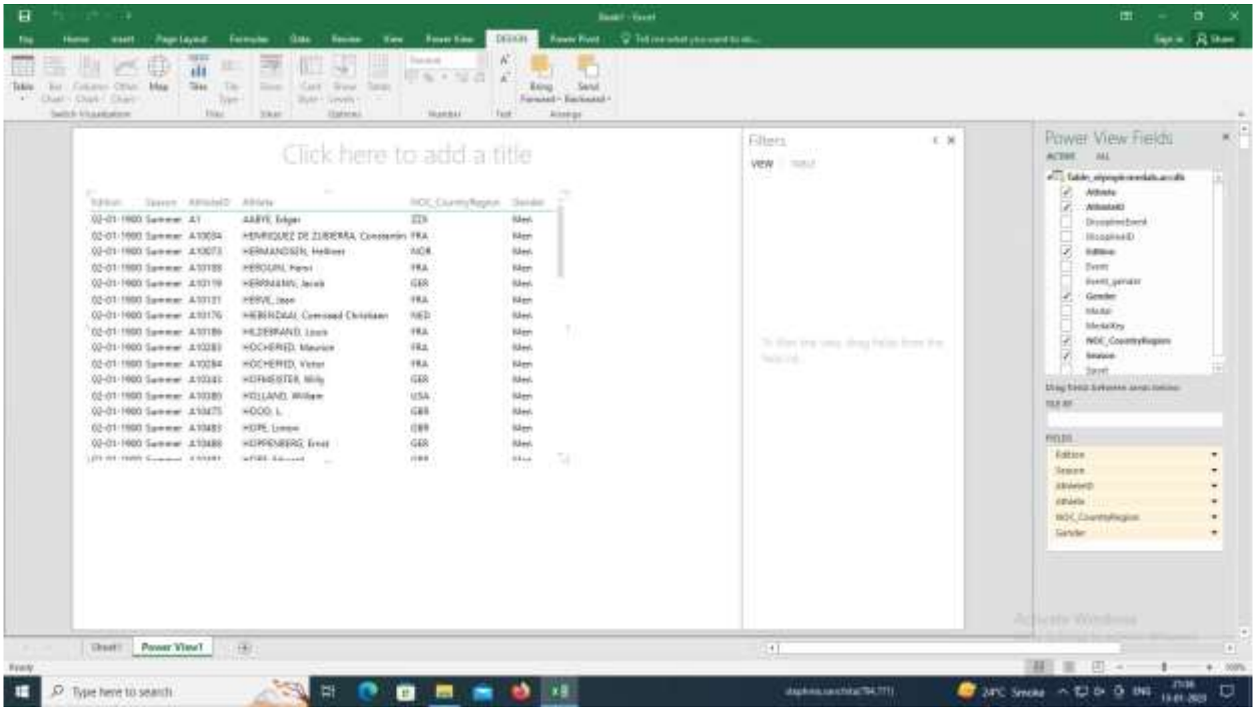
Count of Medal	Column Labels										
Row Labels	BEL	CHN	FRA	GER	HUN	ITA	NED	RUS	URS	USA	Grand Total
Archery	51	15	46	6		12	9	1	7	52	199
Diving		80	1	24		9		24	14	141	293
Fencing	44	19	283	51	220	328	34	41	145	48	1209
Figure skating	3	7	18	11	12	2	3	29	42	51	178
Speed skating	1	25		54		7	75	6	60	73	277
Grand Total	99	120	348	126	238	358	111	101	268	355	2126

Practical 5 Data Analysis and Visualization using Advanced Excel

Step 1 − Click on the File menu and then Click on Options.



The Excel Options window appears.
Step 2 − Click on Add-Ins.
Step 3 − In the Manage box, click the drop-down arrow and select Excel Add-ins.
Step 4 − All the available Add-ins will be displayed. If Power View Add-in is enabled, it
appears in Active Application Add-ins

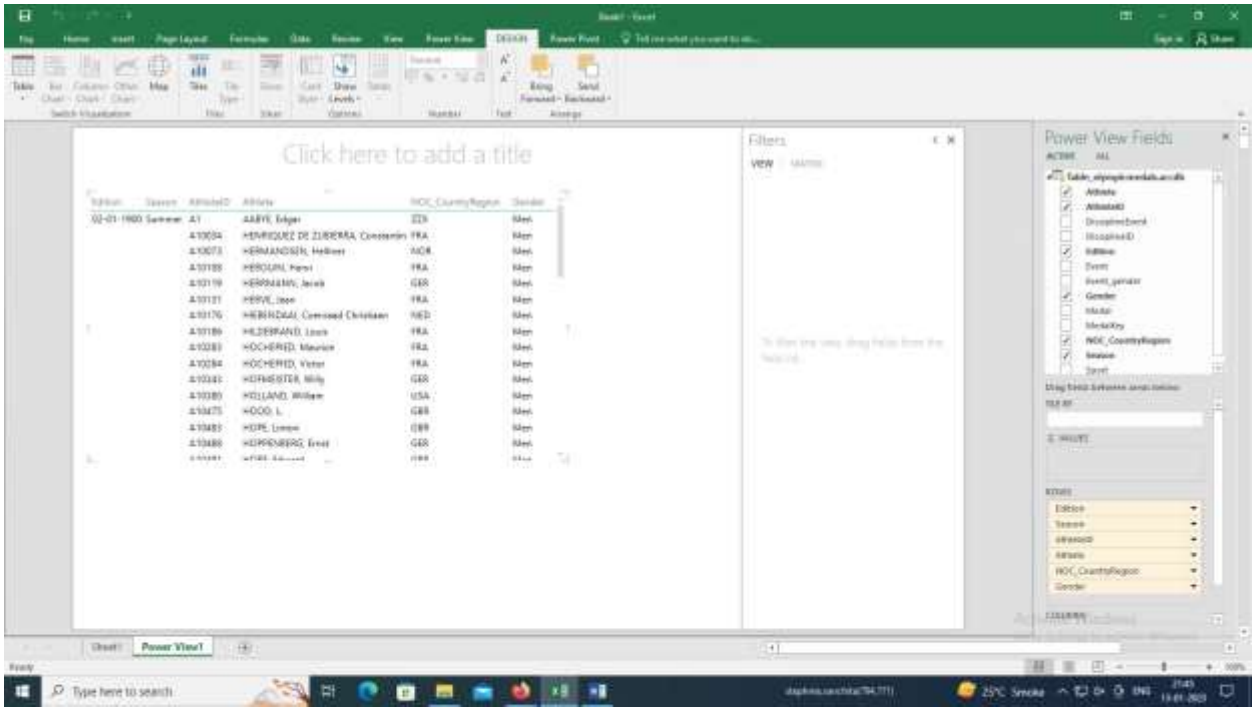


Click here to add a title

Edition	Season	AthleteID	Athlete	NOC_CountryRegion	Gender
02-01-1900	Summer	A1	AABYE, Edgar	ZZX	Men
02-01-1900	Summer	A10084	HENRIQUEZ DE ZUBIERRA, Constantin	FRA	Men
02-01-1900	Summer	A10073	HERMANDSEN, Helliver	NOR	Men
02-01-1900	Summer	A10108	HEROUIN, Henri	FRA	Men
02-01-1900	Summer	A10119	HERRMANN, Jacob	GER	Men
02-01-1900	Summer	A10121	HERVE, Jean	FRA	Men
02-01-1900	Summer	A10176	HEBENDAAL, Coenraad Christiaan	NED	Men
02-01-1900	Summer	A10186	HILDEBRAND, Louis	FRA	Men
02-01-1900	Summer	A10283	HOCHEPIED, Maurice	FRA	Men
02-01-1900	Summer	A10284	HOCHEPIED, Victor	FRA	Men
02-01-1900	Summer	A10341	HOFMEISTER, Willy	GER	Men
02-01-1900	Summer	A10380	HOLLAND, William	USA	Men
02-01-1900	Summer	A10475	HOOD, L.	GBR	Men
02-01-1900	Summer	A10483	HOPE, Linton	GBR	Men
02-01-1900	Summer	A10488	HOPPENBERG, Ernst	GER	Men

Table_olympicmedals.accdb
☑ Athlete
☑ AthleteID
☐ DisciplineEvent
☐ DisciplineID
☑ Edition
☐ Event
☐ Event_gender
☑ Gender
☐ Medal
☐ MedalKey
☑ NOC_CountryRegion
☑ Season
☐ Sport

Drag fields between areas below:
TILE BY
FIELDS
Edition
Season
AthleteID
Athlete
NOC_CountryRegion
Gender

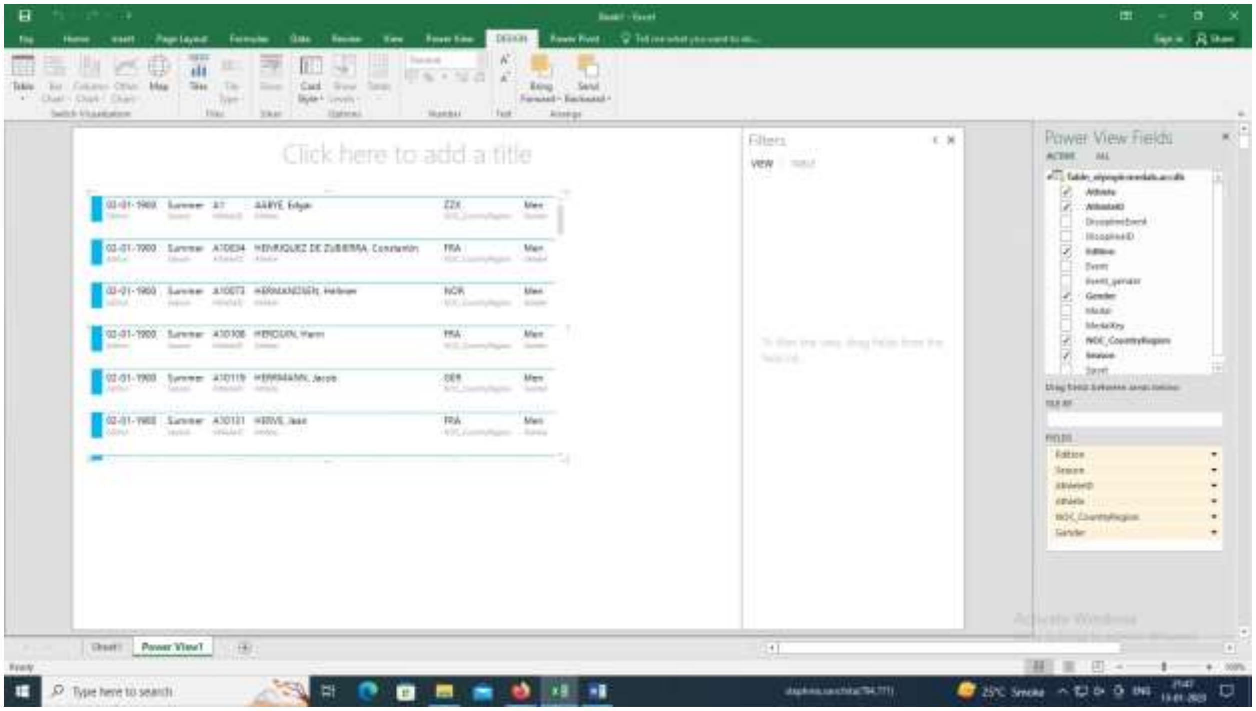


Click here to add a title

Edition	Season	AthleteID	Athlete	NOC_CountryRegion	Gender
02-01-1900	Summer	A1	AABYE, Edgar	ZZX	Men
		A10084	HENRIQUEZ DE ZUBIERRA, Constantin	FRA	Men
		A10073	HERMANDSEN, Helliver	NOR	Men
		A10108	HEROUIN, Henri	FRA	Men
		A10119	HERRMANN, Jacob	GER	Men
		A10121	HERVE, Jean	FRA	Men
		A10176	HEBENDAAL, Coenraad Christiaan	NED	Men
		A10186	HILDEBRAND, Louis	FRA	Men
		A10283	HOCHEPIED, Maurice	FRA	Men
		A10284	HOCHEPIED, Victor	FRA	Men
		A10341	HOFMEISTER, Willy	GER	Men
		A10380	HOLLAND, William	USA	Men
		A10475	HOOD, L.	GBR	Men
		A10483	HOPE, Linton	GBR	Men
		A10488	HOPPENBERG, Ernst	GER	Men

Table_olympicmedals.accdb
☑ Athlete
☑ AthleteID
☐ DisciplineEvent
☐ DisciplineID
☑ Edition
☐ Event
☐ Event_gender
☑ Gender
☐ Medal
☐ MedalKey
☑ NOC_CountryRegion
☑ Season
☐ Sport

Drag fields between areas below:
TILE BY
Σ VALUES
ROWS
Edition
Season
AthleteID
Athlete
NOC_CountryRegion
Gender
COLUMNS



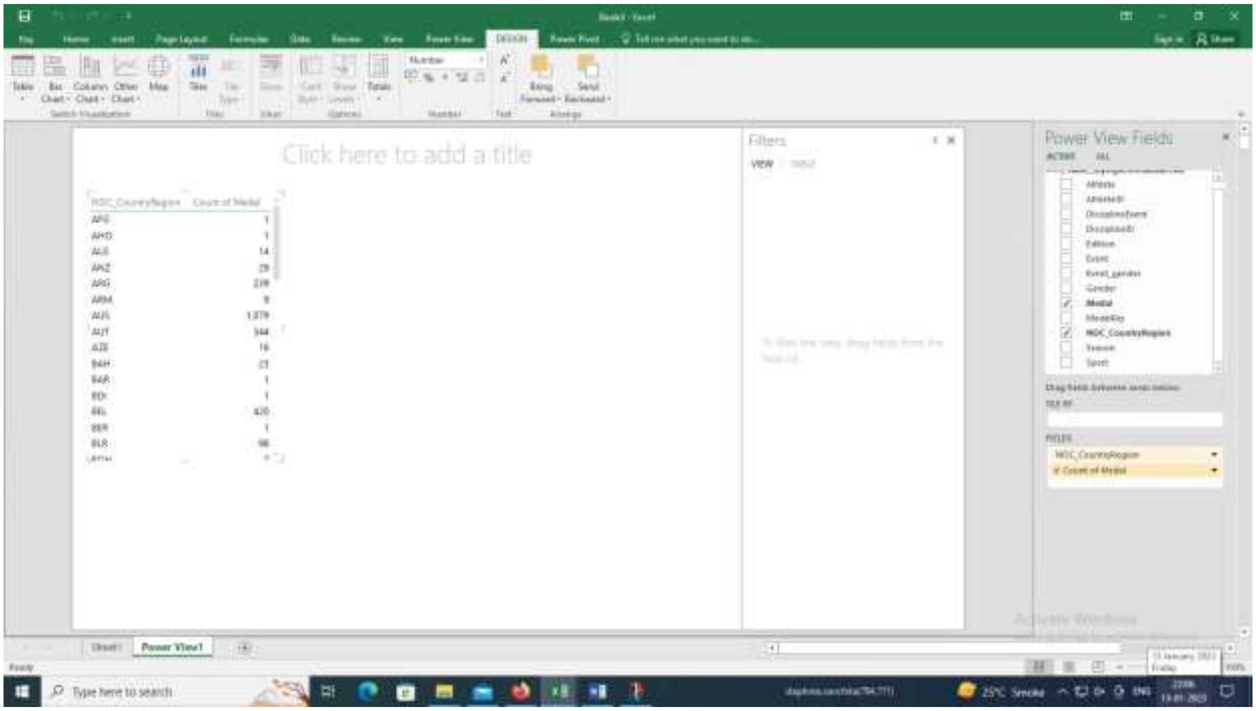
Click here to add a title

02-01-1900	Summer	A1	AARYE, Edgar	ZZX	Men
02-01-1900	Summer	A10034	HENRIQUEZ DE ZUBIERRA, Constantin	FRA	Men
02-01-1900	Summer	A10073	HERMANDSEN, Helmer	NOR	Men
02-01-1900	Summer	A10108	HERDUIN, Henri	FRA	Men
02-01-1900	Summer	A10119	HERRMANN, Jacob	GER	Men
02-01-1900	Summer	A10121	HERVE, Jean	FRA	Men

Power View Fields

FIELDS: Edition, Season, AthleteID, Athlete, NOC_CountryRegion, Gender

Step 1 − Create a Table Visualization from Medals data.
Step 2 − Create a Table Visualization for two Columns, NOC_CountryRegion and Count of Medal.
Step 3 − Create the same Table Visualization below.



Click here to add a title

NOC_CountryRegion	Count of Medal
AFG	1
AHO	1
ALG	14
ANZ	29
ARG	239
ARM	9
AUS	1,079
AUT	344
AZE	16
BAH	23
BAR	1
BDI	1
BEL	420
BER	1
BLR	96

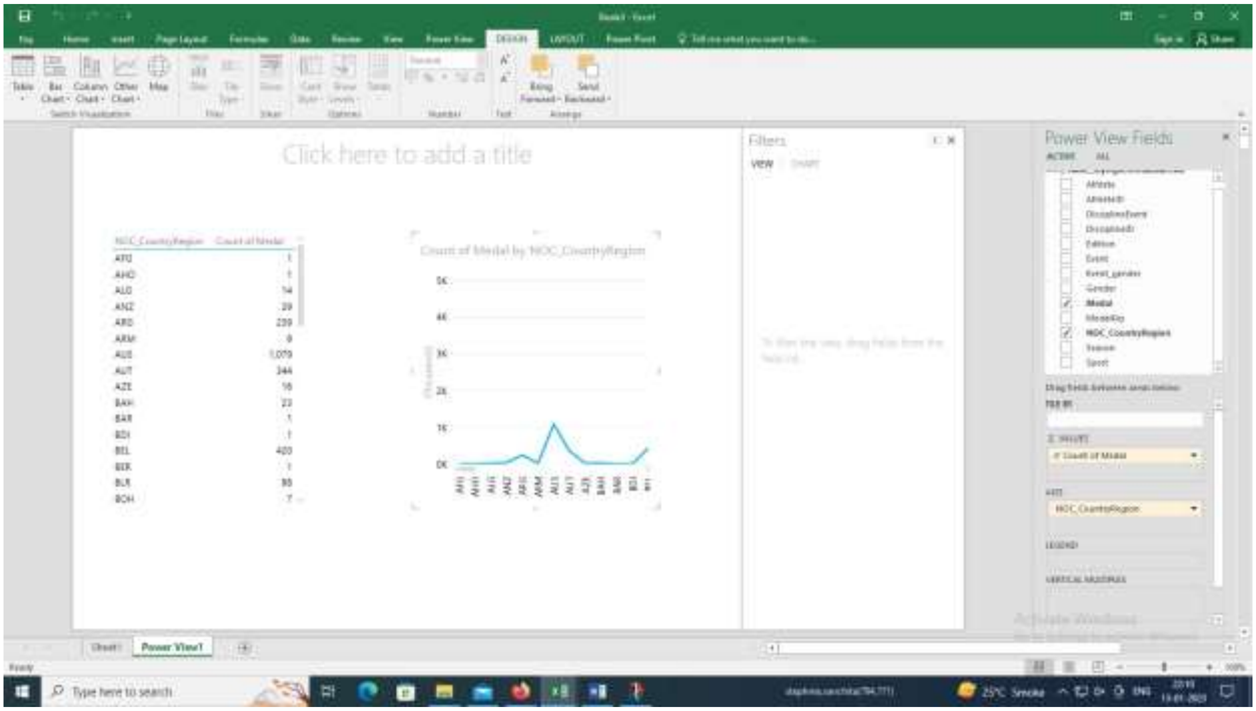
Power View Fields

FIELDS: NOC_CountryRegion, Σ Count of Medal

Step 4 − Click on the Table Visualization below.

Step 5 − Click on Other Chart in the Switch Visualization group.

Step 6 − Click on Line



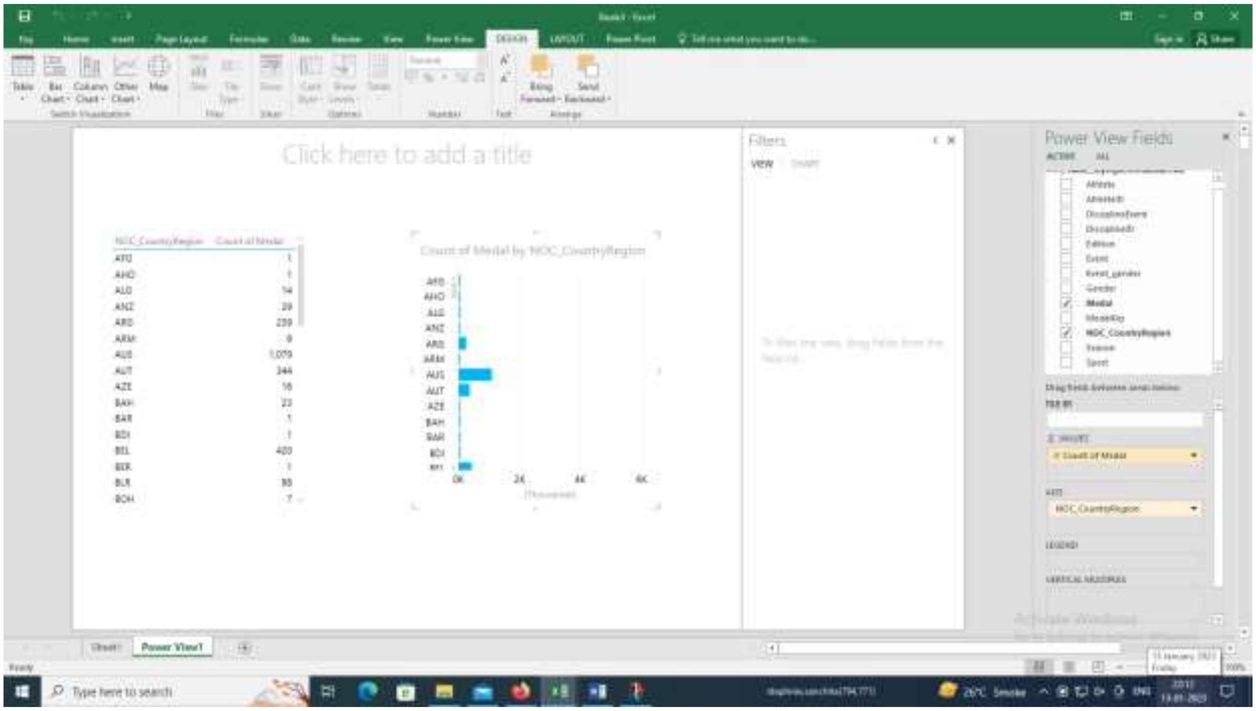
NOC_CountryRegion	Count of Medal
AFG	1
AHO	1
ALG	14
ANZ	29
ARG	239
ARM	9
AUS	1,079
AUT	344
AZE	16
BAH	23
BAR	1
BDI	1
BEL	400
BER	1
BLR	95
BOH	7

Click here to add a title
Count of Medal by NOC_CountryRegion
5K
4K
3K
2K
1K
0K
Filters
Power View Fields

Step 7 − Click on the Line Chart Visualization.

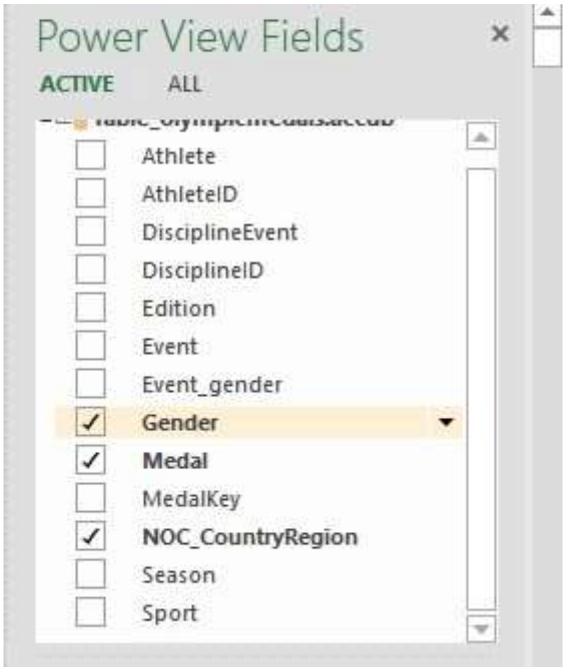
Step 8 − Click on Bar Chart in the Switch Visualization Group.

Step 9 − Click on the Stacked Bar option



NOC_CountryRegion	Count of Medal
AFG	1
AHO	1
ALG	14
ANZ	29
ARG	239
ARM	9
AUS	1,079
AUT	344
AZE	16
BAH	23
BAR	1
BDI	1
BEL	400
BER	1
BLR	95
BOH	7

Step 10 − In the Power View Fields, in the Medals Table, select the Field Gender also.

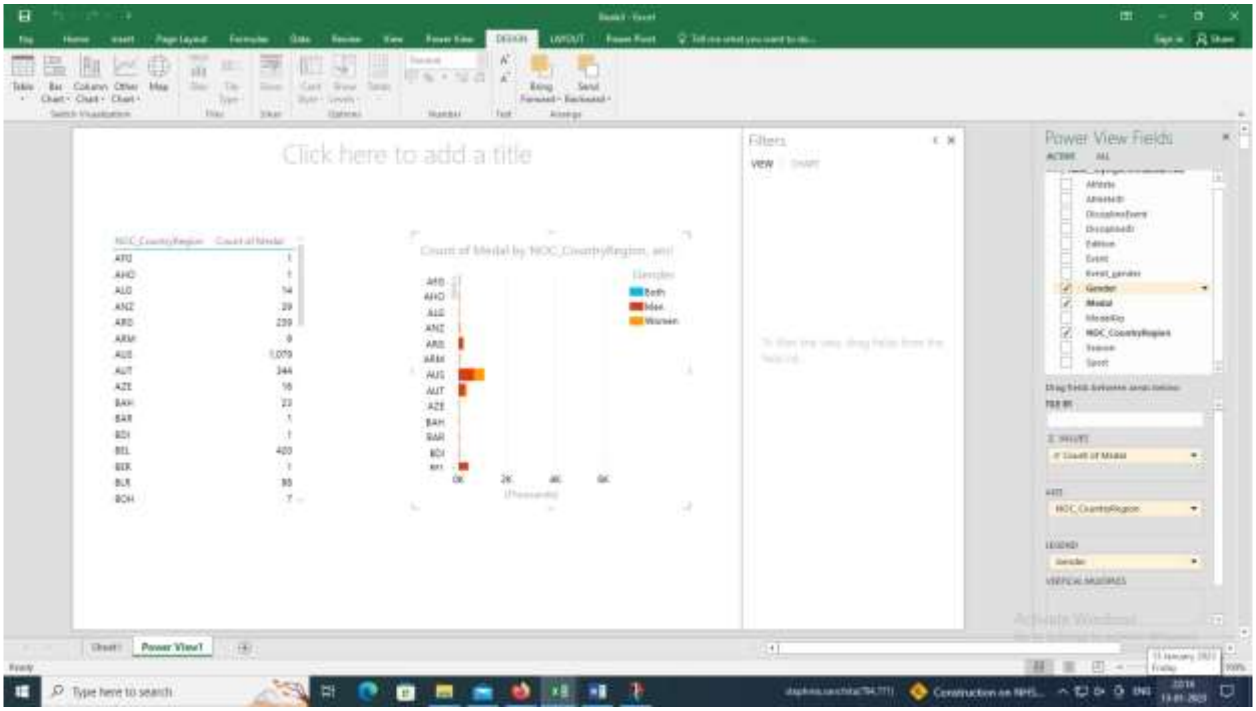


Power View Fields

ACTIVE ALL

Table_olympicmedals.accdb

☐ Athlete
☐ AthleteID
☐ DisciplineEvent
☐ DisciplineID
☐ Edition
☐ Event
☐ Event_gender
☑ Gender
☑ Medal
☐ MedalKey
☑ NOC_CountryRegion
☐ Season
☐ Sport

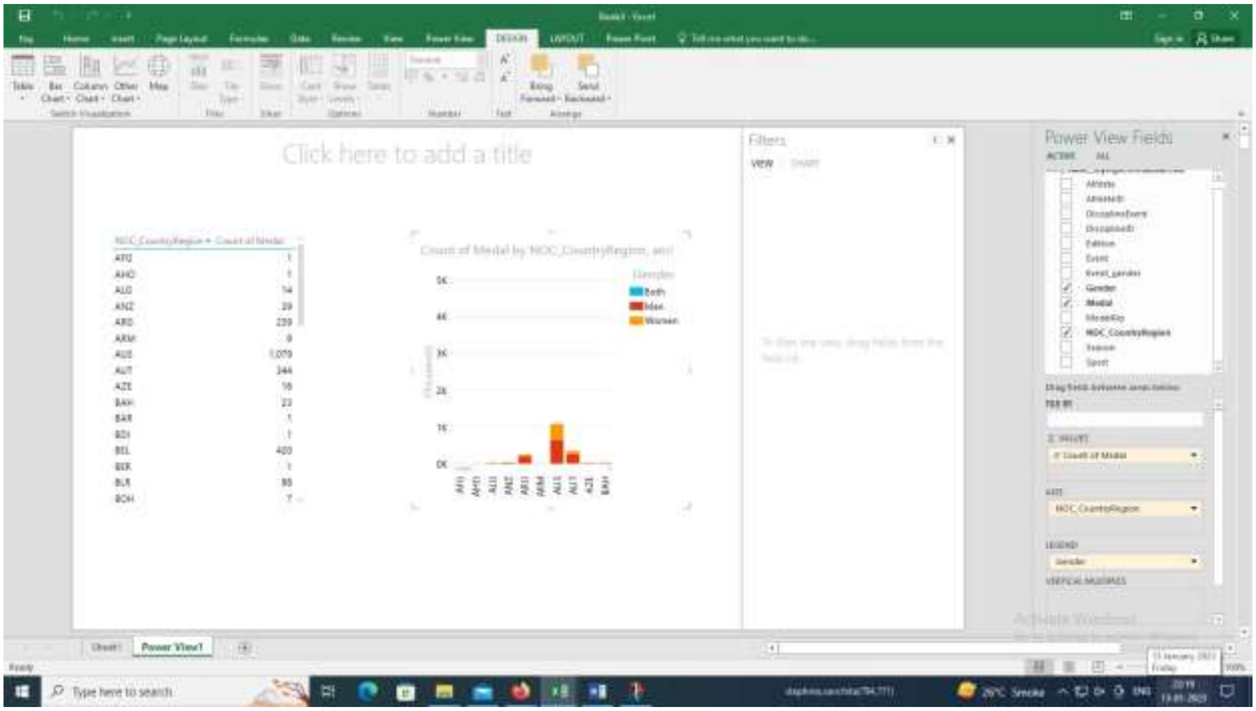


Click here to add a title

NOC_CountryRegion	Count of Medal
AFG	1
AHO	1
ALG	14
ANZ	29
ARG	239
ARM	9
AUS	1,079
AUT	344
AZE	16
BAH	23
BAR	1
BDI	1
BEL	400
BER	1
BLR	95
BOH	7

Step 12 − Click on the Stacked Bar Chart Visualization.
Step 13 − Click on Column Chart in the Switch Visualization group.

Step 14 − Click on Stacked Column



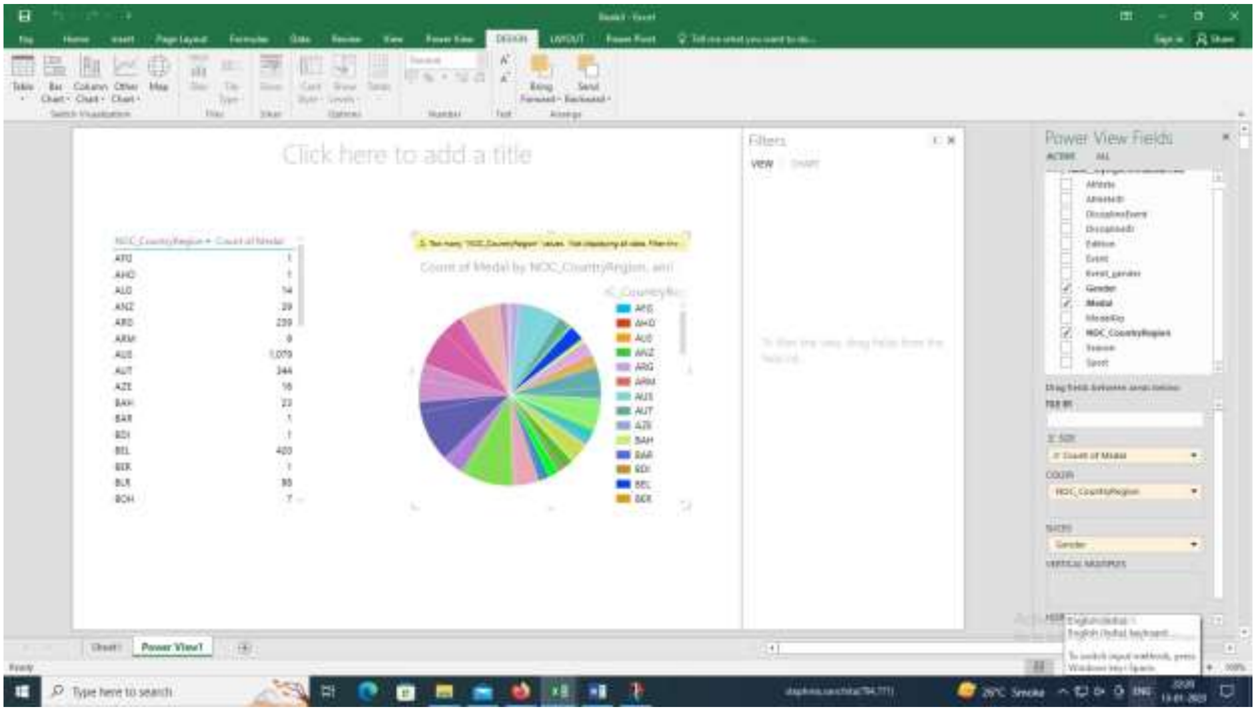
NOC_CountryRegion	Count of Medal
AFG	1
AHO	1
ALG	14
ANZ	29
ARG	239
ARM	9
AUS	1,079
AUT	344
AZE	16
BAH	23
BAR	1
BDI	1
BEL	400
BER	1
BLR	95
BOH	7

You can have simple Pie Chart Visualizations in Power View.

Step 1 − Click on the Table Visualization as shown below.

Step 2 − Click on Other Chart in the Switch Visualization group. Step

Step 3 − Click on Pie as shown in the image given below.



NOC_CountryRegion	Count of Medal
AFG	1
AHO	1
ALG	14
ANZ	29
ARG	239
ARM	9
AUS	1,079
AUT	344
AZE	16
BAH	23
BAR	1
BDI	1
BEL	400
BER	1
BLR	95
BOH	7

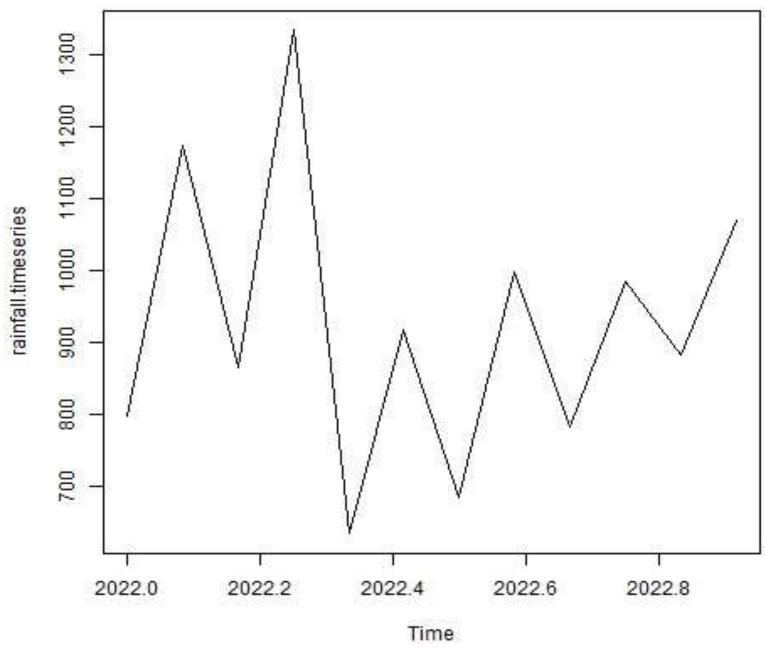
Practical 6 : Implementation of Classification algorithm in R Programming.

Code

```
> rainfall <-
c(799,1174.8,865.1,1334.6,635.4,918.5,685.5,998.6,784.2,985,882.8,1071)
> rainfall.timeseries <- ts(rainfall,start = c(2022,1),frequency = 12)
> print(rainfall.timeseries)
> png(file = "rainfall.png")
> plot(rainfall.timeseries)
> dev.off() null

device

        1
```

Output

```
      Jan    Feb    Mar    Apr    May    Jun    Jul    Aug    Sep    Oct    Nov    Dec
2022  799.0 1174.8  865.1 1334.6  635.4  918.5  685.5  998.6  784.2  985.0  882.8
1071.0
```

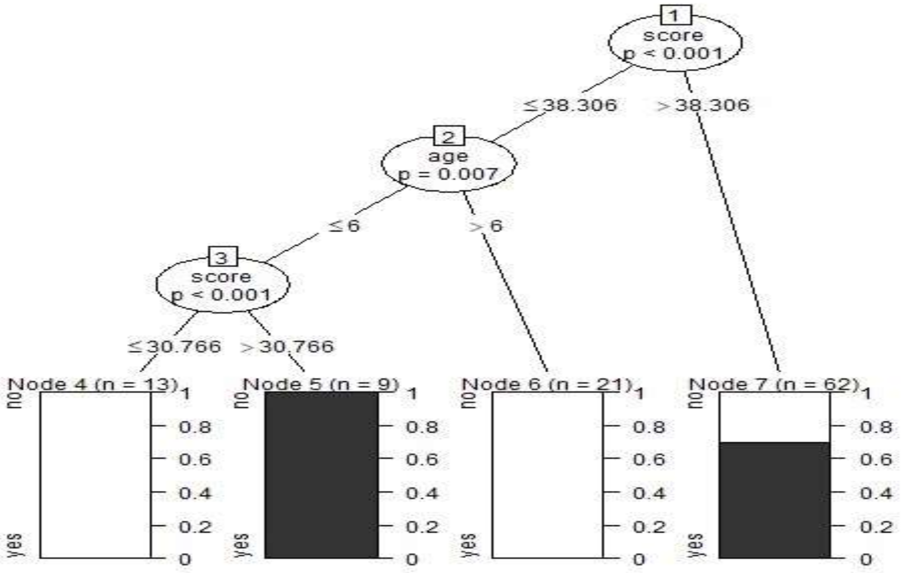


Practical 7: Practical Implementation of Decision Tree using R Tool

```
> install.packages("party")
> library(party)
> print(head(readingSkills))
> library(party)
> input.dat <- readingSkills[c(1:105),]
> png(file = "decision_tree.png")
> output.tree <- ctree(nativeSpeaker ~ age + shoeSize + score,data = input.dat) >
plot(output.tree)
> dev.off()
```

Output

```
  nativeSpeaker age shoeSize    score
1                  yes   5 24.83189 32.29385

2                  yes   6 25.95238 36.63105

3                  yes   7 28.66450 40.28456
4                  yes  11 31.88207 55.46085 6

5                   yes  10 30.07843 52.83124

 null device

          1
```



Practical 8 : k-means clustering using R

```
> newiris <- iris
> newiris$Species<- NULL
> (kc <- kmeans(newiris,3))
```

Output

```
K-means clustering with 3 clusters of sizes 50, 38, 62 Cluster

means:

  Sepal.Length Sepal.Width Petal.Length Petal.Width
1       5.006000    3.428000     1.462000    0.246000
2       6.850000    3.073684     5.742105    2.071053
3       5.901613    2.748387     4.393548    1.433871 Clustering vector:

  [1] 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
1 1 1 1 1
 [48] 1 1 1 3 3 2 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 2 3 3 3 3 3 3 3 3 3 3 3
3 3 3 3 3
 [95] 3 3 3 3 3 3 2 3 2 2 2 2 3 2 2 2 2 2 2 3 3 2 2 2 2 3 2 3 2 3 2 2 3 3 2 2 2 2 2 3 2 2
2 2 3 2 2
[142] 2 3 2 2 2 3 2 2 3
Within cluster sum of squares by cluster:
[1] 15.15100 23.87947 39.82097

(between_SS / total_SS =  88.4 %) Available

components:

[1] "cluster"      "centers"      "totss"        "withinss"     "tot.withinss" "betweenss"
[7] "size"         "iter"         "ifault"
```

code

```
> table(iris$Species,kc$cluster)
```

Output

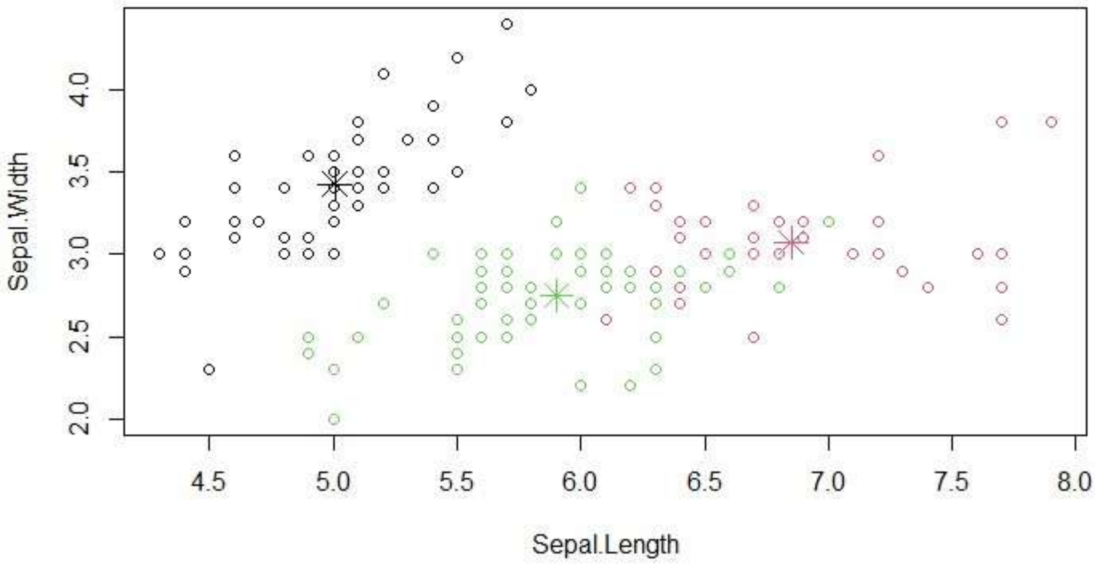
```
            1  2  3   setosa

50  0  0   versicolor  0
```

```
2 48    virginica    0 36
14
```

Code

```
> plot(newiris[c("Sepal.Length","Sepal.Width")],col=kc$cluster)
> points(kc$centers[,c("Sepal.Length","Sepal.Width")],col=1:3,pch=8,cex=2)
```

Output



Pratical 9: Prediction Using Linear Regression Create Relationship Model & get the Coefficients

```
> x <- c(151, 174, 138, 186, 128, 136, 179, 163, 152, 131)
>
> y <- c(63, 81, 56, 91, 47, 57, 76, 72, 62, 48)
> relation <- lm(y~x)
> print(relation) Output:
```

```
Call:
lm(formula = y ~ x) Coefficients:

(Intercept)           x
   -38.4551      0.6746
```

Get the Summary of the Relationship

```
> x <- c(151, 174, 138, 186, 128, 136, 179, 163, 152, 131)
>
> y <- c(63, 81, 56, 91, 47, 57, 76, 72, 62, 48)
> relation <- lm(y~x)
> print(summary(relation))
```

Output:

```
Call:
lm(formula = y ~ x) Residuals:

    Min      1Q  Median      3Q     Max
-6.3002 -1.6629  0.0412  1.8944  3.9775  Coefficients:

            Estimate Std. Error t value Pr(>|t|)    (Intercept) -

38.45509    8.04901  -4.778  0.00139 **  x

0.67461    0.05191  12.997 1.16e-06 ***

---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1
Residual standard error: 3.253 on 8 degrees of freedom
Multiple R-squared:  0.9548, Adjusted R-squared:  0.9491
F-statistic: 168.9 on 1 and 8 DF,  p-value: 1.164e-06
```

Predict the weight of new persons

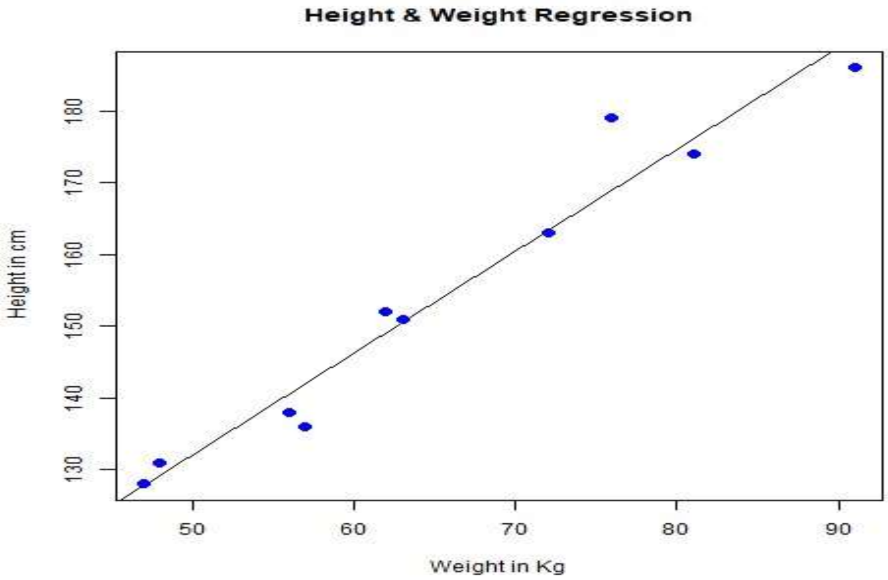
```
> x <- c(151, 174, 138, 186, 128, 136, 179, 163, 152, 131)
>
> y <- c(63, 81, 56, 91, 47, 57, 76, 72, 62, 48)
> relation <- lm(y~x)
> a <- data.frame(x = 170)
> result <- predict(relation,a)
> print(result)
      1
76.22869
```

Visualize the Regression Graphically

```
> x <- c(151, 174, 138, 186, 128, 136, 179, 163, 152, 131)
> y <- c(63, 81, 56, 91, 47, 57, 76, 72, 62, 48)
> relation <- lm(y~x)
> png(file="linearregression.png")
> plot(y,x,col = "blue",main = "Height & Weight Regression",abline(lm(x~y)),cex
= 1.3,pch = 16,xlab = "Weight in Kg",ylab = "Height in cm")
> dev.off()
```

```
png    4
```

Output

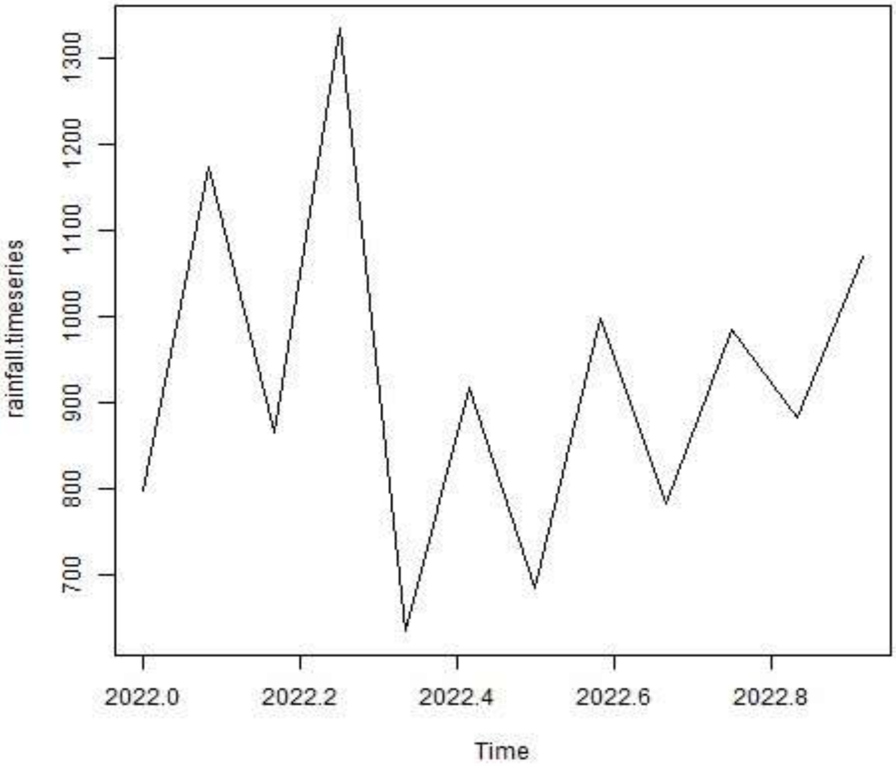


Practical 10: Data Analysis using Time Series Analysis

```
rainfall

<-c(799,1174.8,865.1,1334.6,635.4,918.5,685.5,998.6,784.2,985,882.8,1071)
> rainfall.timeseries <- ts(rainfall,start = c(2022,1),frequency = 12)
> print(rainfall.timeseries)
> png(file = "rainfall.png")
> plot(rainfall.timeseries)
> dev.off() null

device

      1
```

Output

```
      Jan    Feb    Mar    Apr    May    Jun    Jul    Aug    Sep    Oct    Nov    Dec
2022  799.0 1174.8  865.1 1334.6  635.4  918.5  685.5  998.6  784.2  985.0  882.8
1071.0
```


rainfall.timeseries
Time