



Power BI

A Business Intelligence tool



Power



Power BI is a Data Visualization and Business Intelligence tool that converts data from different data sources to interactive dashboards and BI reports.



Power BI

Power BI is a collection of components:

- Power Query - For Cleaning the data
- Power Pivot – creating relationship between multiple data sources
- Power View – to create different type of charts
- Power BI Service – to share



Why Power BI?

- Speed
- User Friendly
- Eye-catching and Interactive Dashboards
- Maximum Features (functions , visuals)
- Cost – cheapest tool
- Data connectivity – can connect to ~ 100 data sources



How Power BI works ?

- Power BI Desktop – used to create reports
- Power BI Service – used to publish the reports



Power BI & Tableau- A Comparison

Feature	Tableau	Power BI
Data Visualization	Tableau the main data visualization tool in the market which provides strong data visualization.	Power BI provides a strong backend data manipulation feature with access to simple visualizations.
Size of Dataset	Tableau can connect much larger datasets	1 GB data limit in free version
Data Sources	Tableau connects to a wide range of data sources, we select the dataset first and then visualizations are used	Power BI covers most of the data sources available in Tableau. Its online version also supports direct visualization on Search Engine (Bling)



Power BI & Tableau- A Comparison

Feature	Tableau	Power BI
Costing	<p>Tableau is expensive as compared to Power BI.</p> <p>Tableau Desktop Profession: USD70/user/month and it can connect to hundreds of data sources.</p>	<p>Power BI provides a free version with 1GB limit on dataset. Power BI Pro is also a cheaper solution when compared with any other BI tool</p> <p>Power BI Pro: USD9.99/user/month (10 GB Storage)</p>



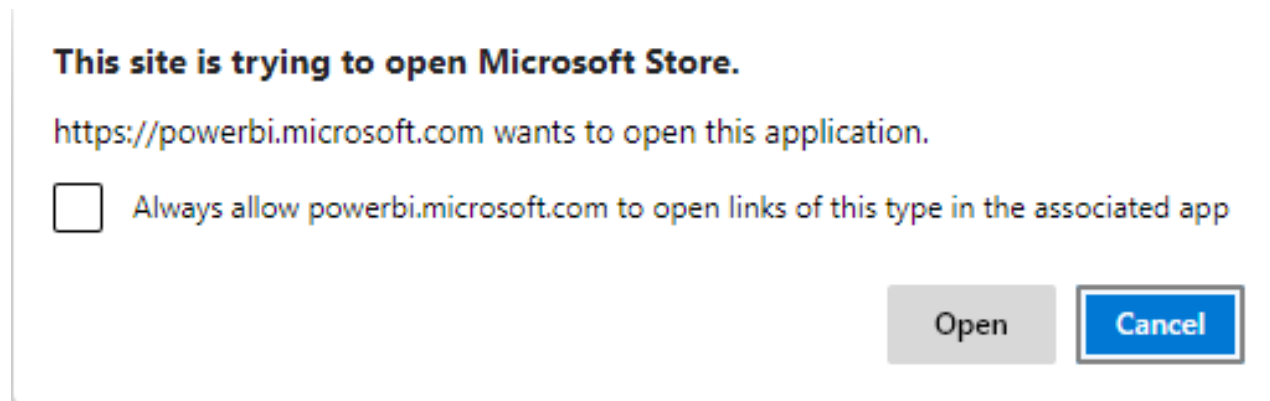
Installing Power BI

(Free)

To download the latest version, use the following link:

<https://powerbi.microsoft.com/en-us/downloads/>

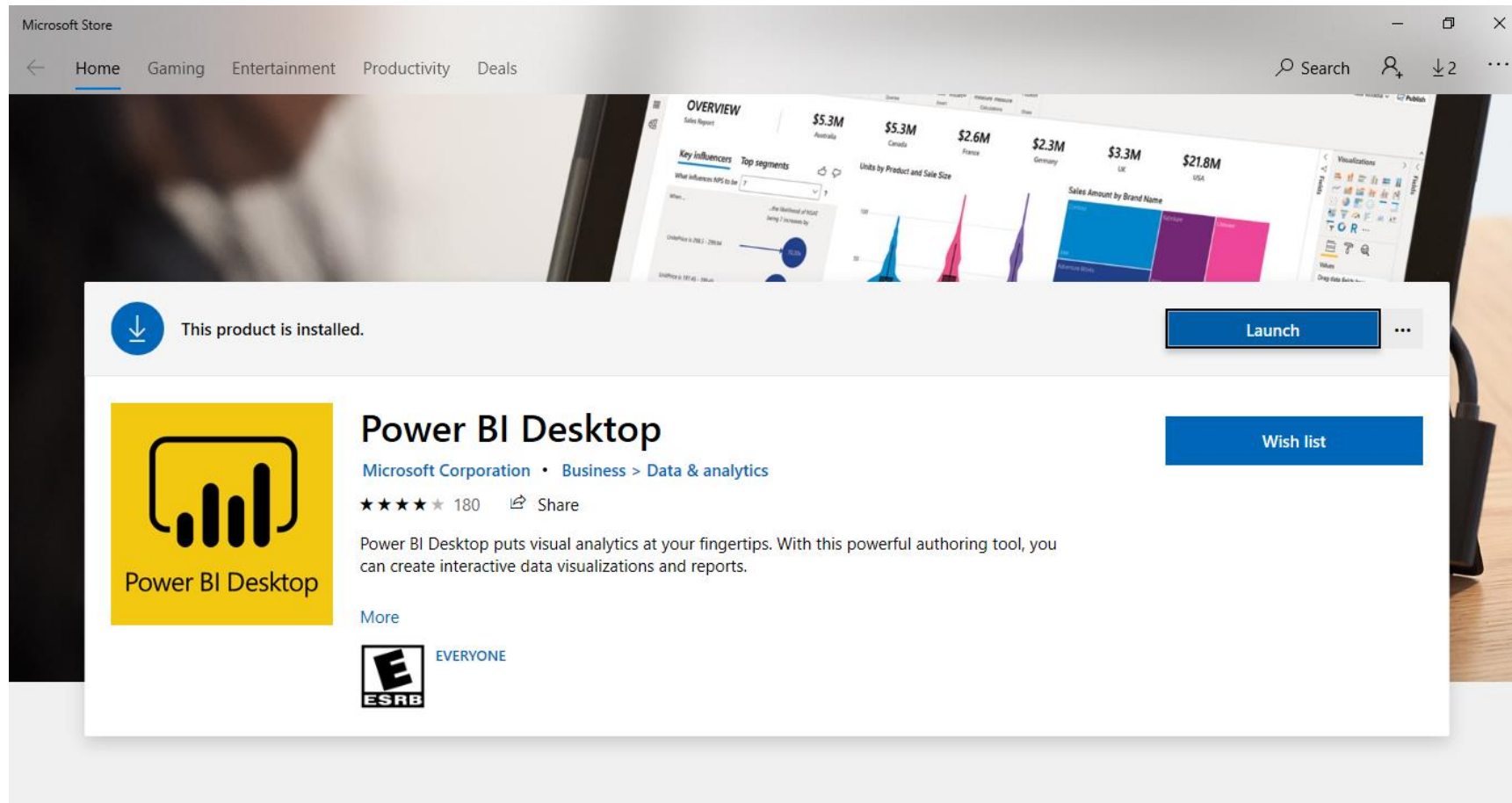
Click on download – You will be prompted to open the MS store click Open



Installing Power BI

(Free)

Once Downloaded you will be getting the launch button

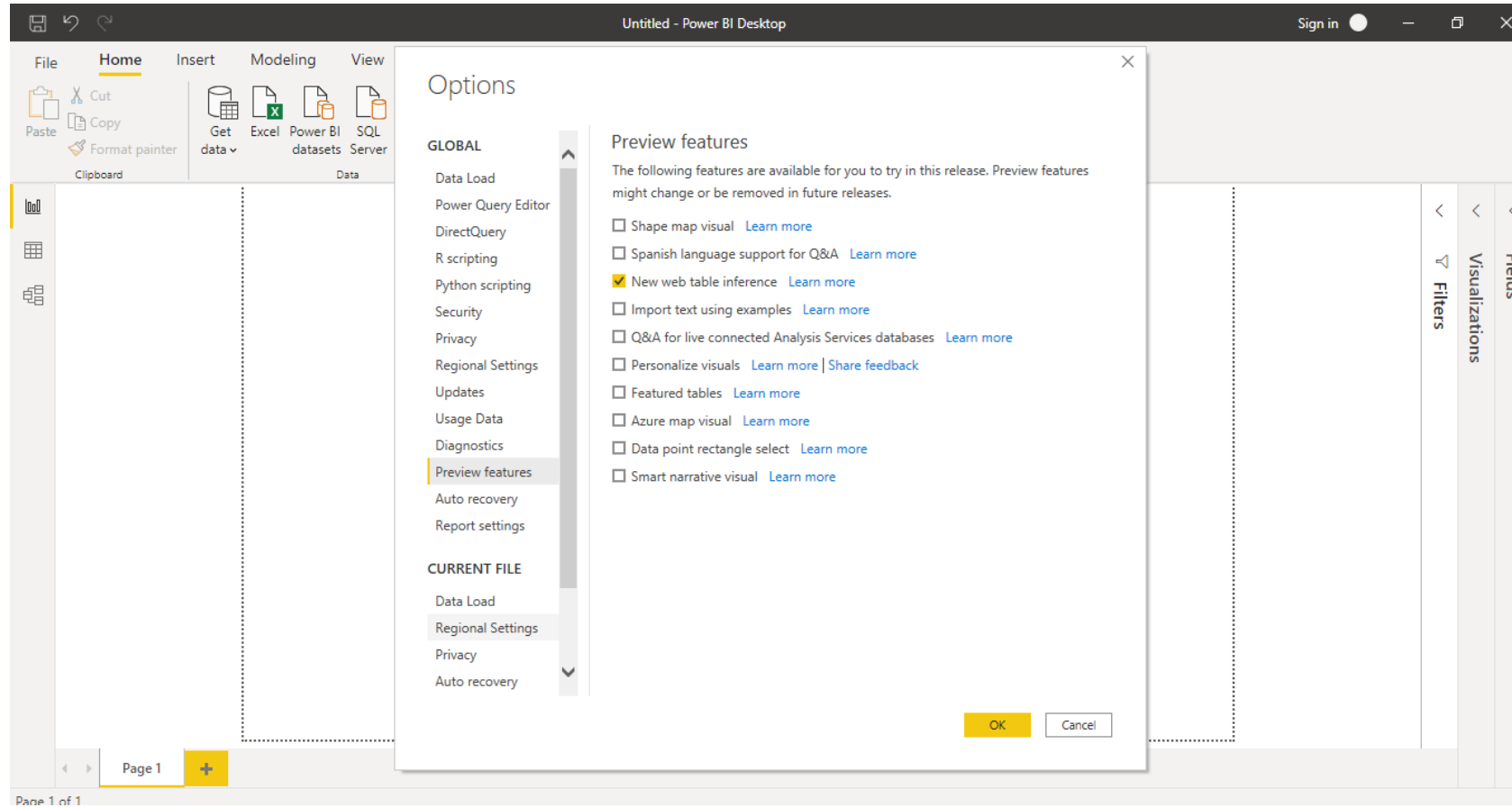


Power Bi upgrades every month



Upgrading Power BI

Use Preview Features (File -> Options) to update Power BI



Power Bi upgrades every month



File





Home

Insert


Modeling

View


Help




Paste




Get data




Excel




Power BI datasets




SQL Server




Enter data




Recent sources




Transform data




Refresh




New visual




Text box




More visuals



New measure



Quick measure



Publish

Clipboard




Data

Queries

Insert

Calculations

Share



Filters


Filters on this page

Add data fields here

Filters on all pages

Add data fields here

Visualizations



Values

Add data fields here

Drill through

Cross-report

Off ☐

Keep all filters

On ☒

Add drill-through fields here

Fields

Page 1

+

Three Steps in Power BI

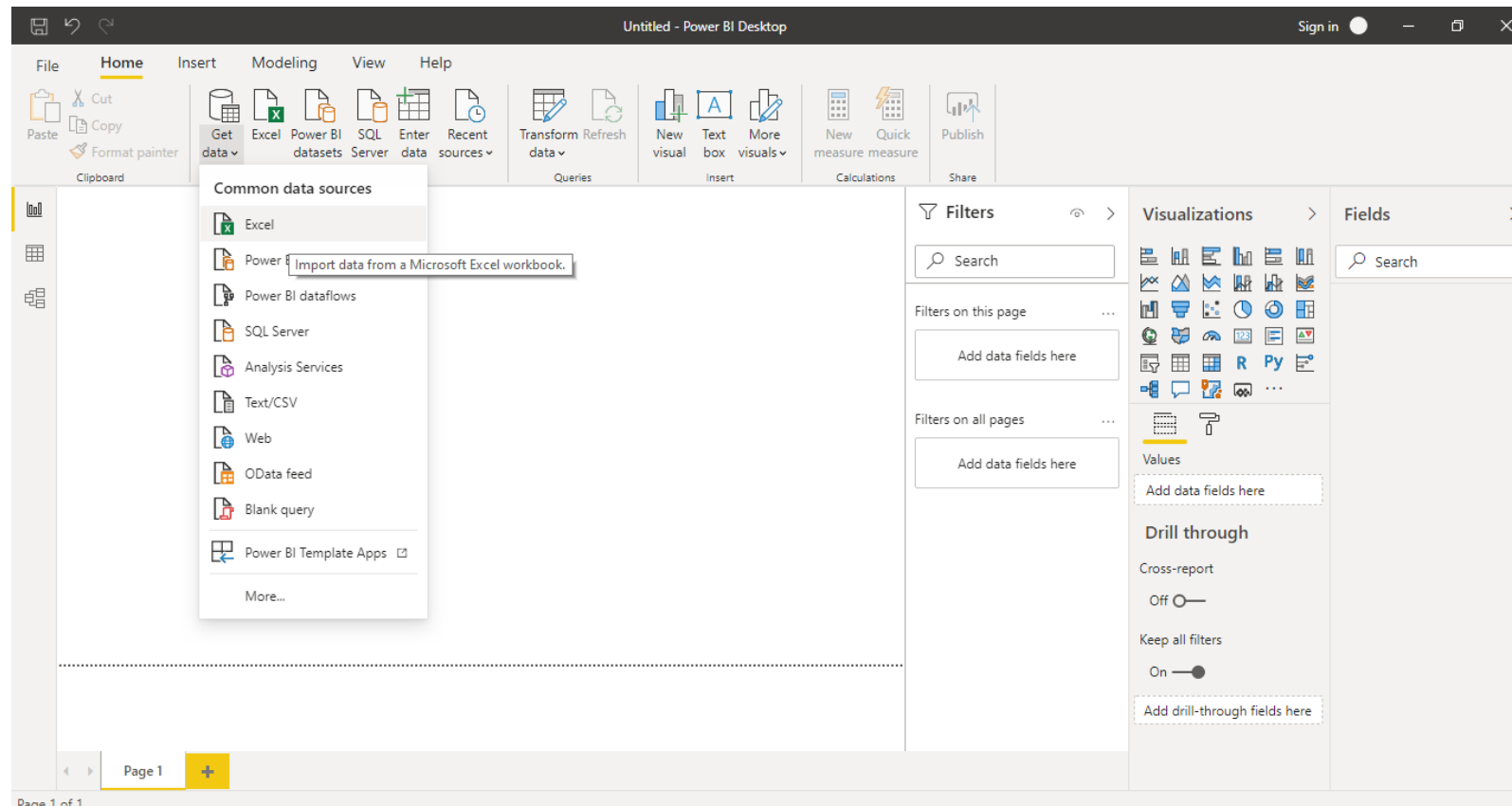
- **Get the Data in Power BI**– It involves locating the data and using an appropriate type of connection to read the data.
- **Choose the visualization** – This involves selecting the chart type to be created.
- **Select the fields to be worked on** – This involves moving the fields to the desired area.



Basic Charts in Power BI

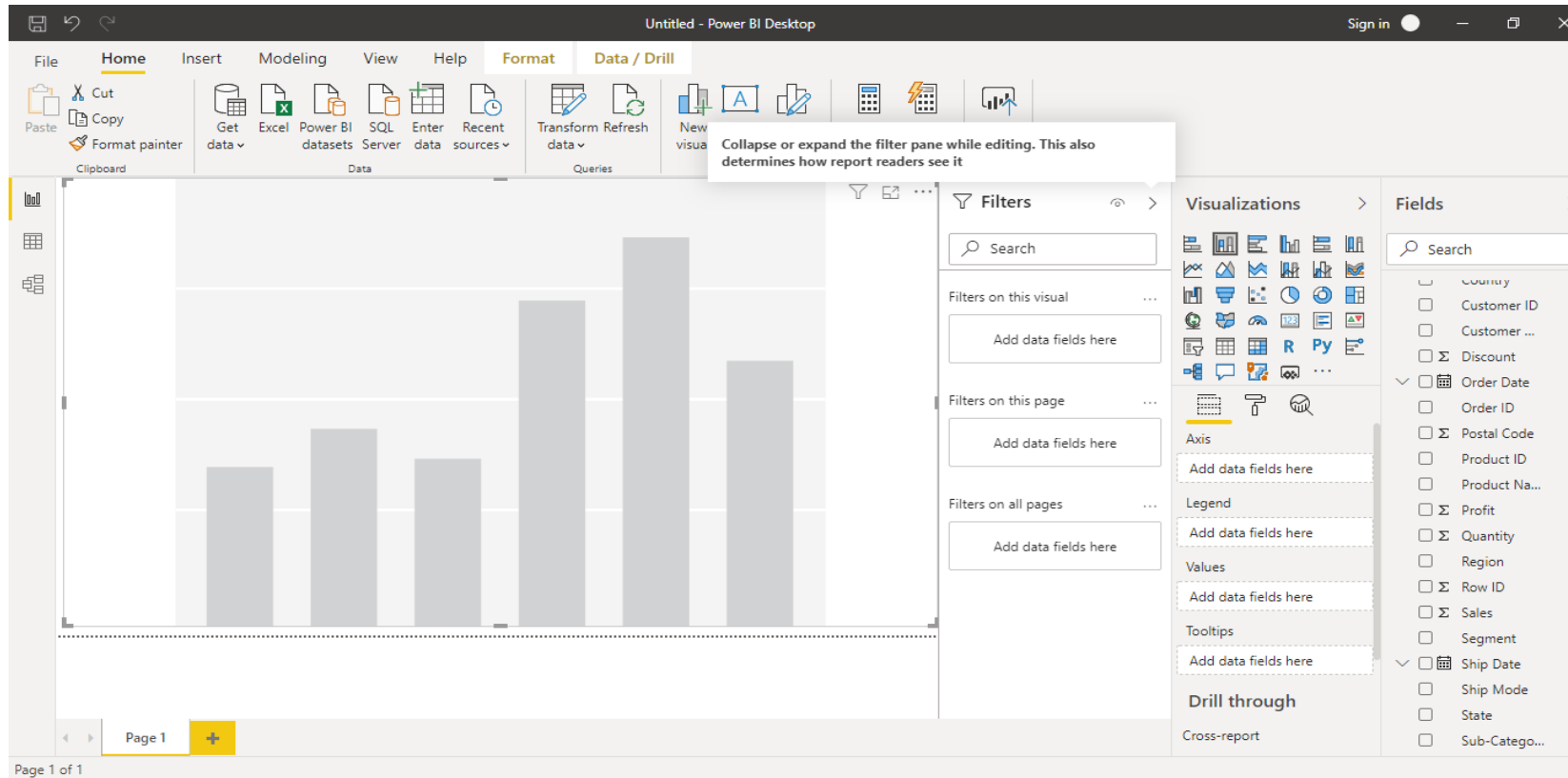
- **Connect to a data source** – It involves locating the data and using an appropriate type of connection to read the data.

Power BI supports large range of data sources. You can click Get data and it shows you all the available data connections.



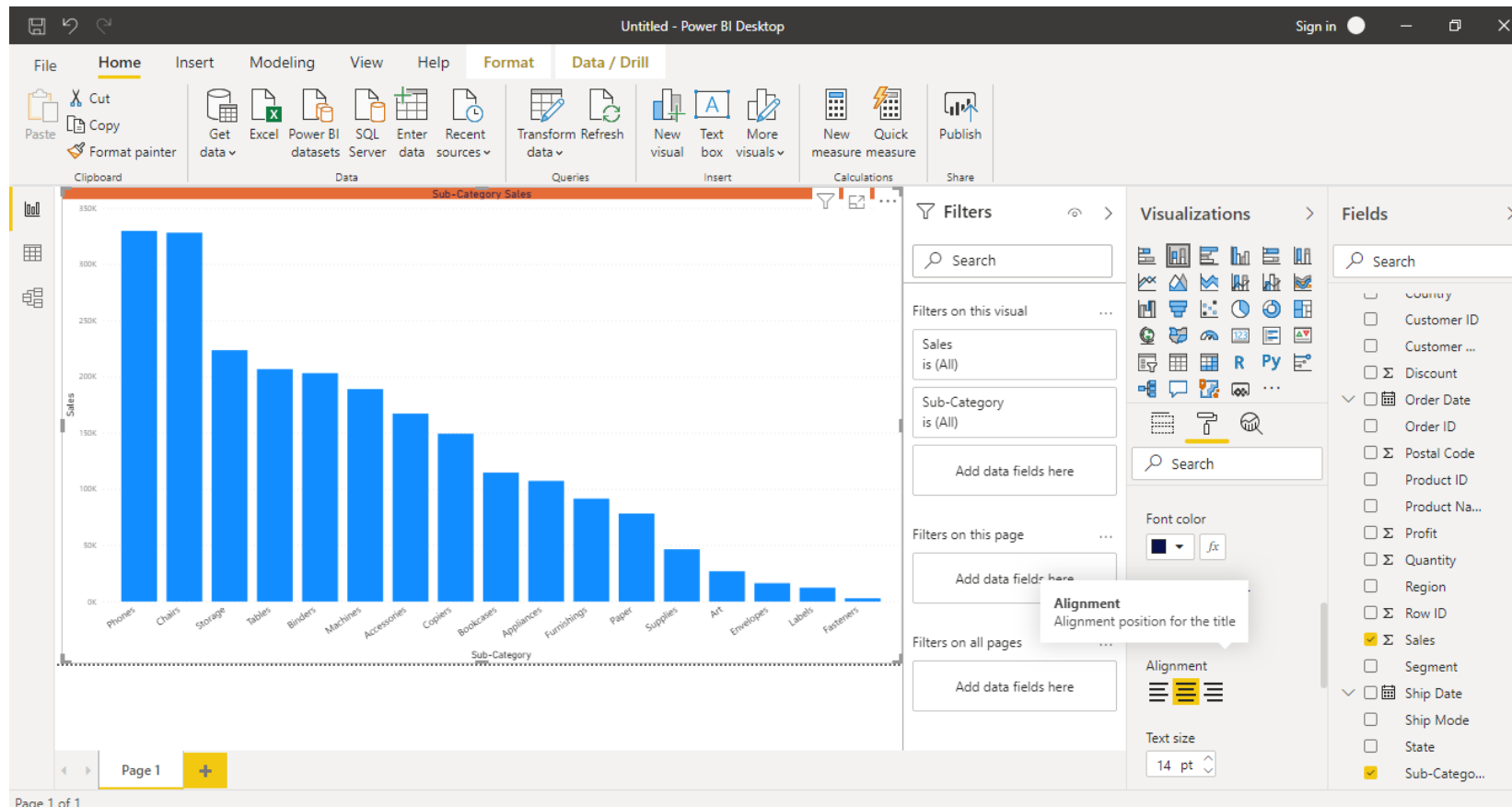
Basic Charts in Power BI

- **Choose the visualization** – This involves selecting the chart type to be created.



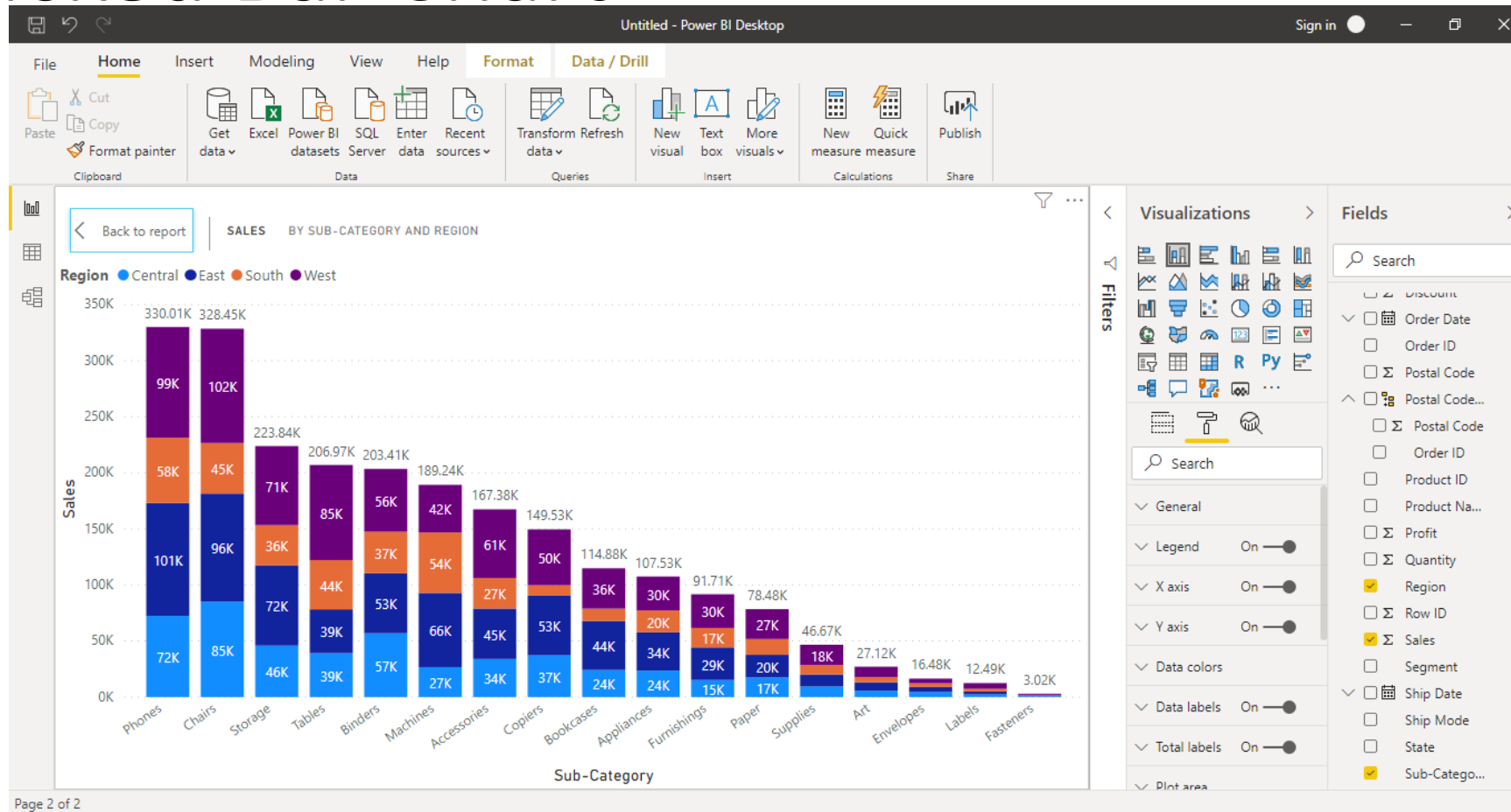
Basic Charts in Power BI – Bar Chart

- **Select the fields to be worked on** – This involves moving the fields to the desired area.



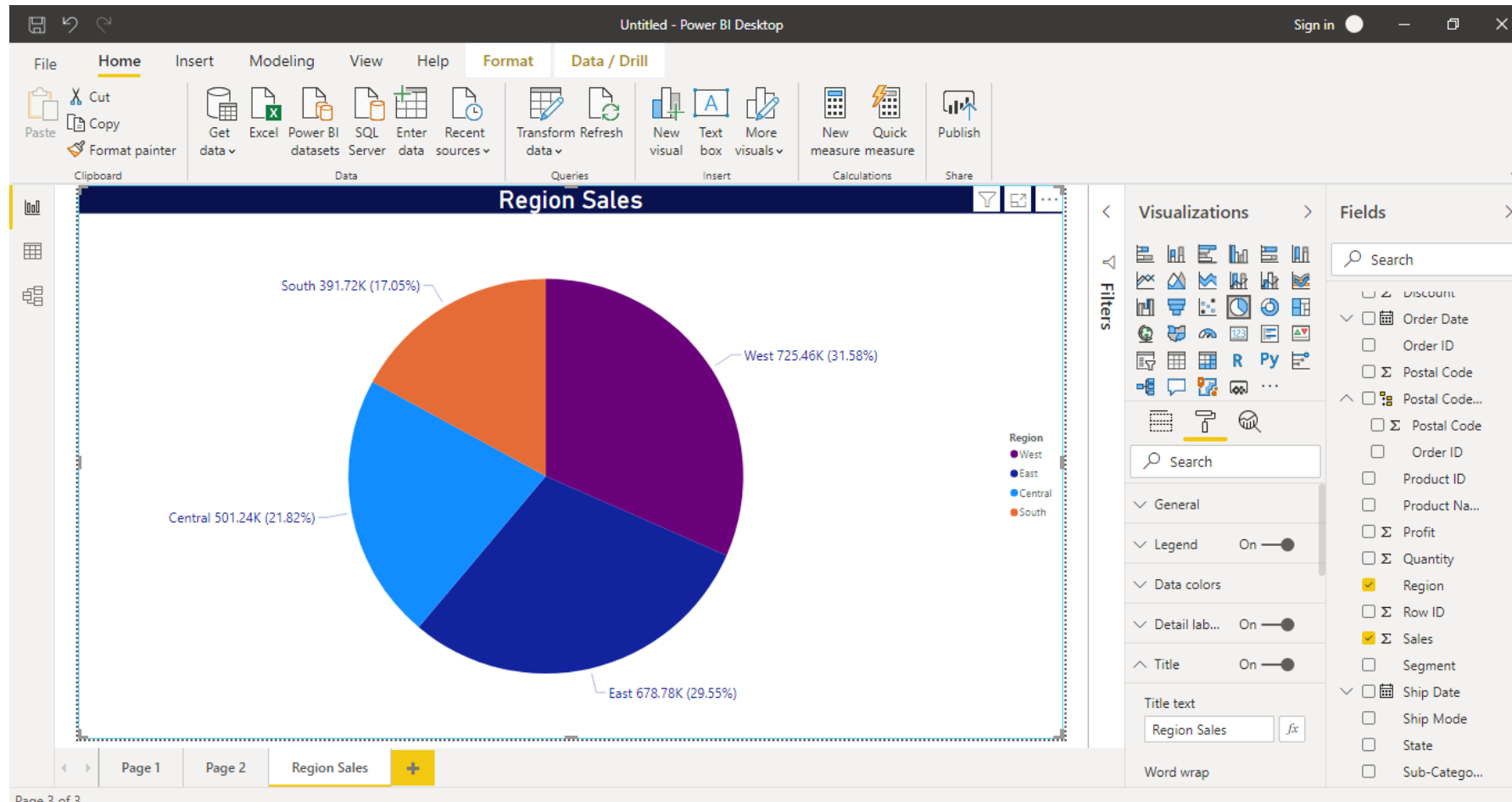
Basic Charts in Power BI

– Stacked Bar Chart



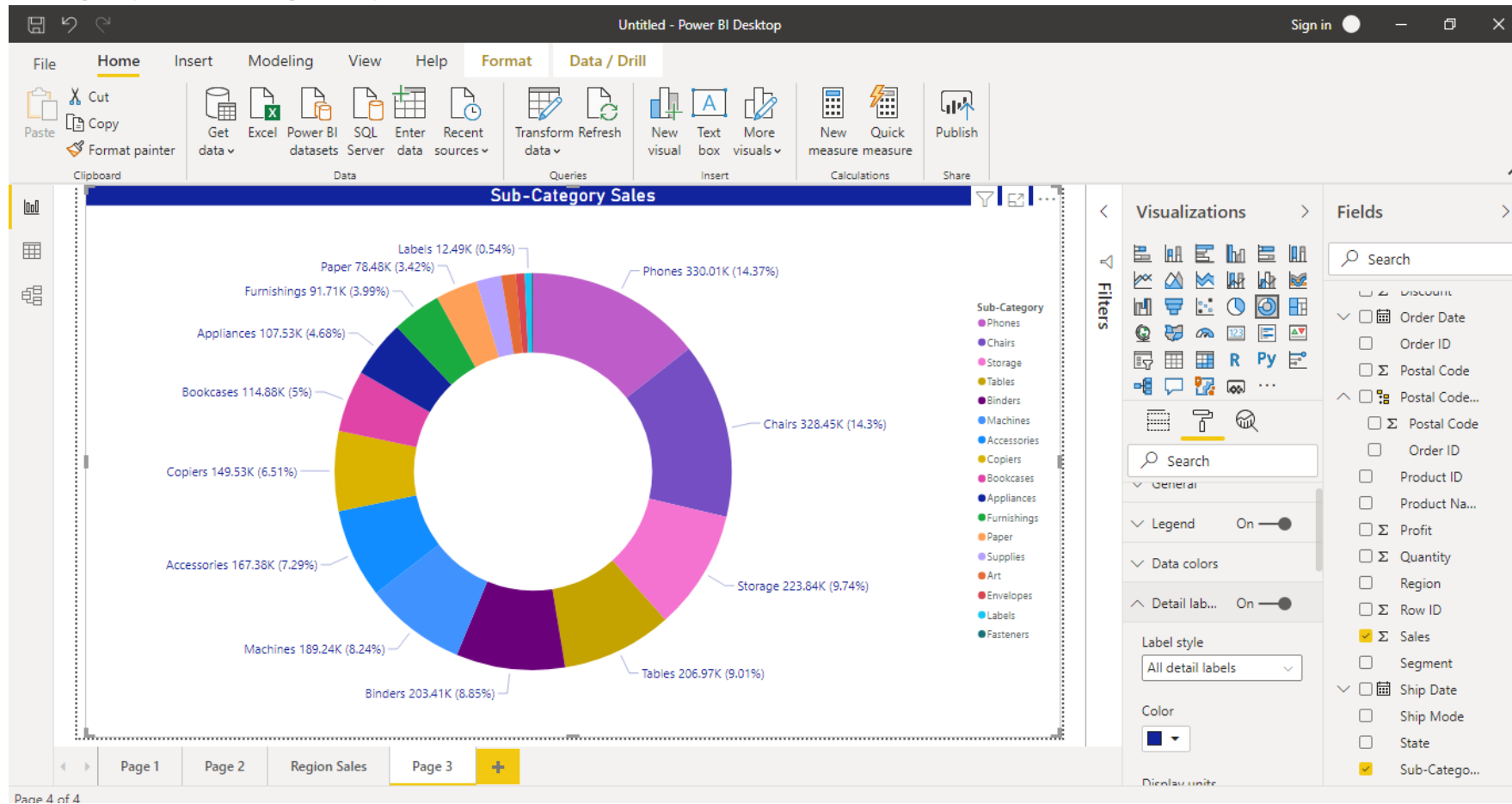
Basic Charts in Power BI

– Pie Chart



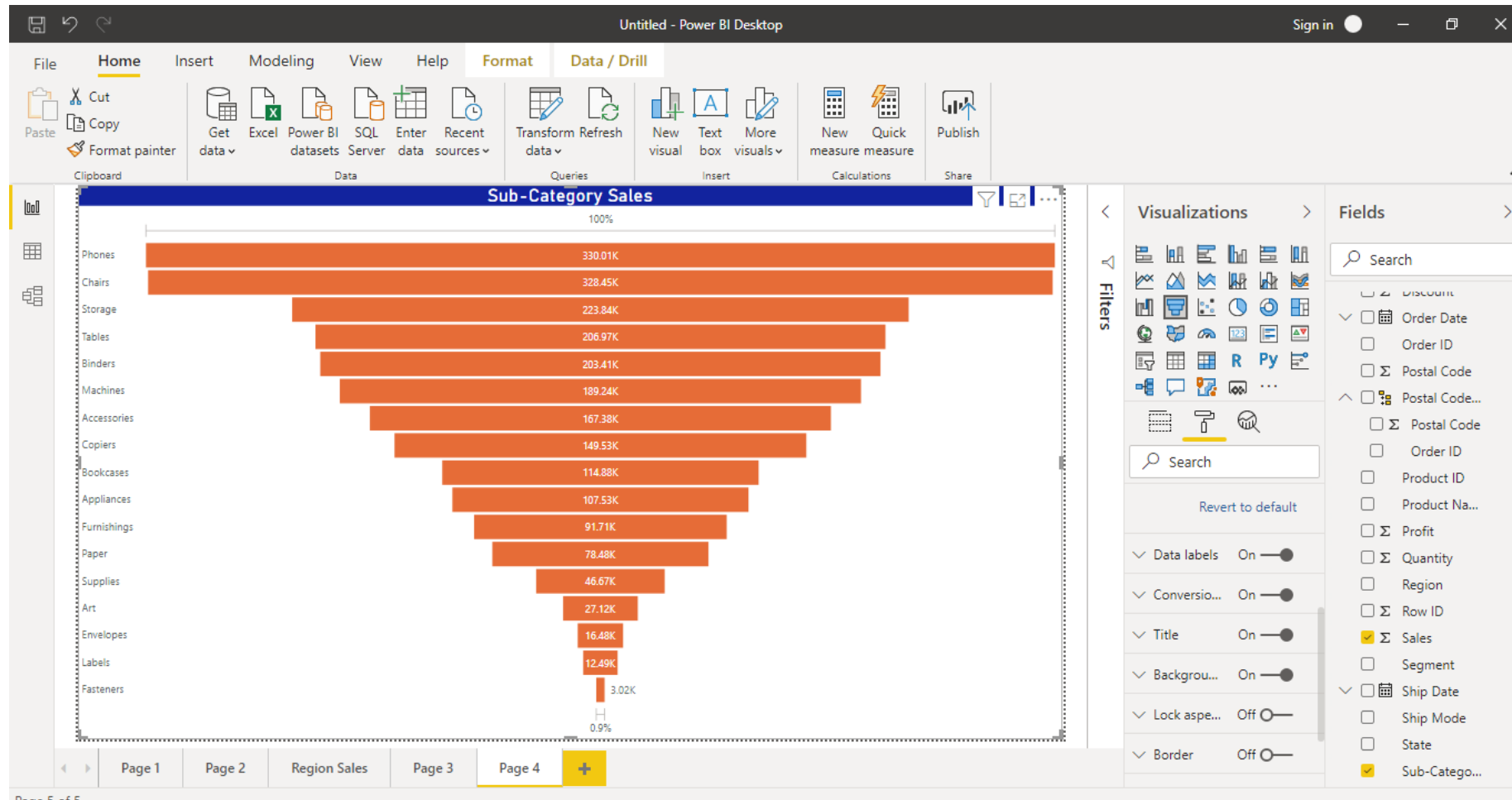
Basic Charts in Power BI

– Donut Chart



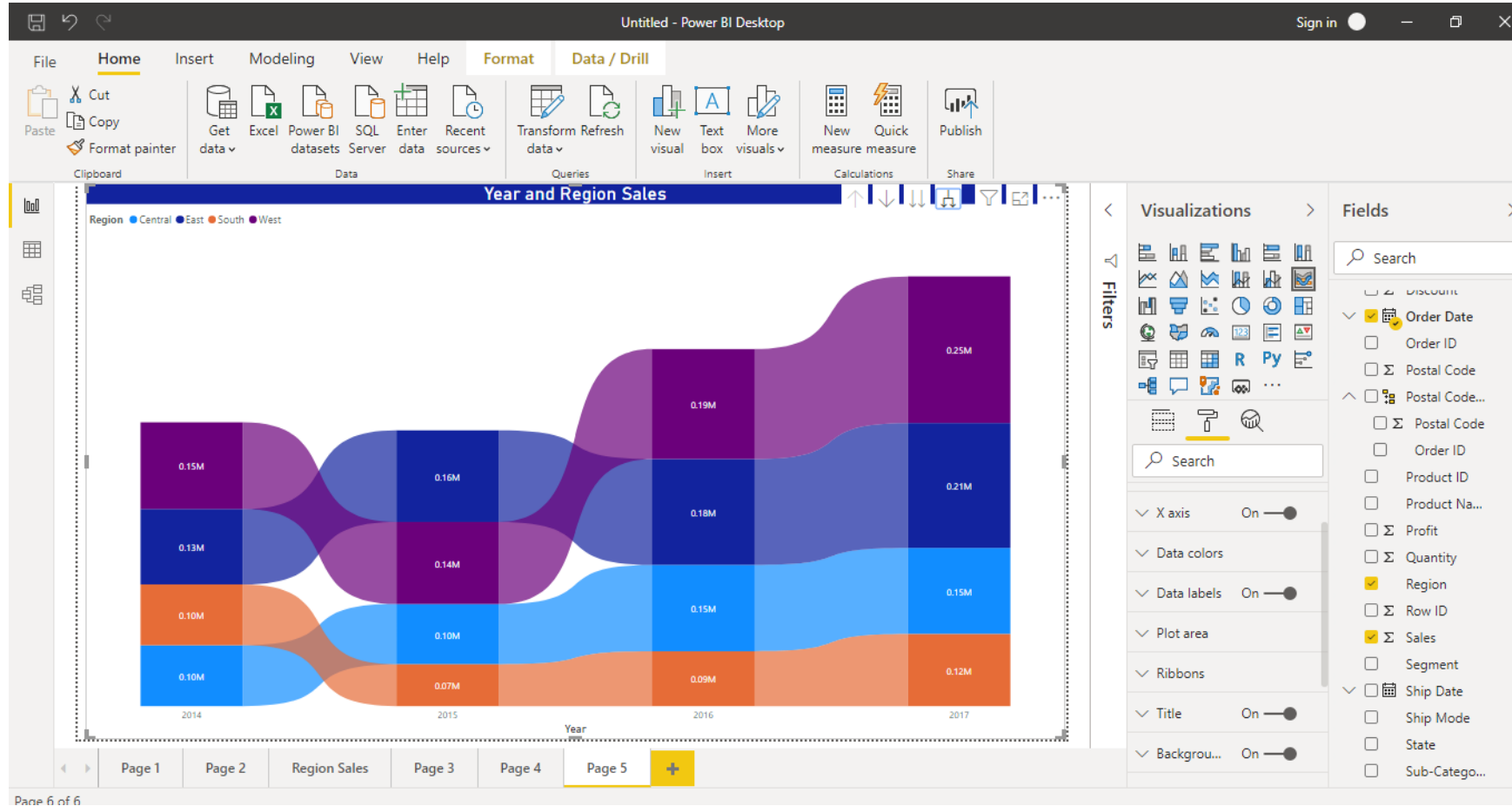
Basic Charts in Power BI

– Funnel Chart



Basic Charts in Power BI

– Ribbon Chart

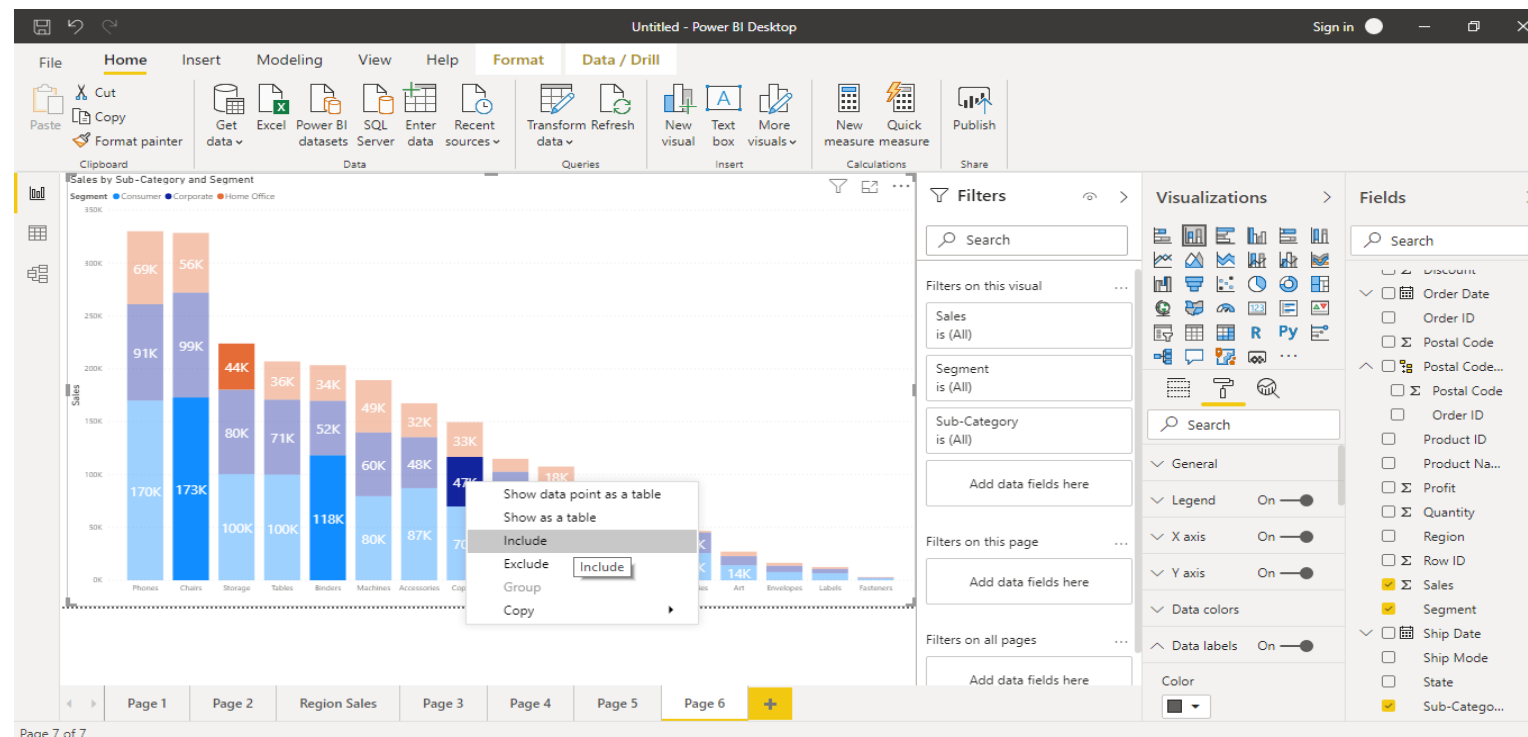


Basic Charts in Power BI

– Include / Exclude

In order to focus on a specific set of points you can now select one or more points and right click to include or exclude points in your visual.

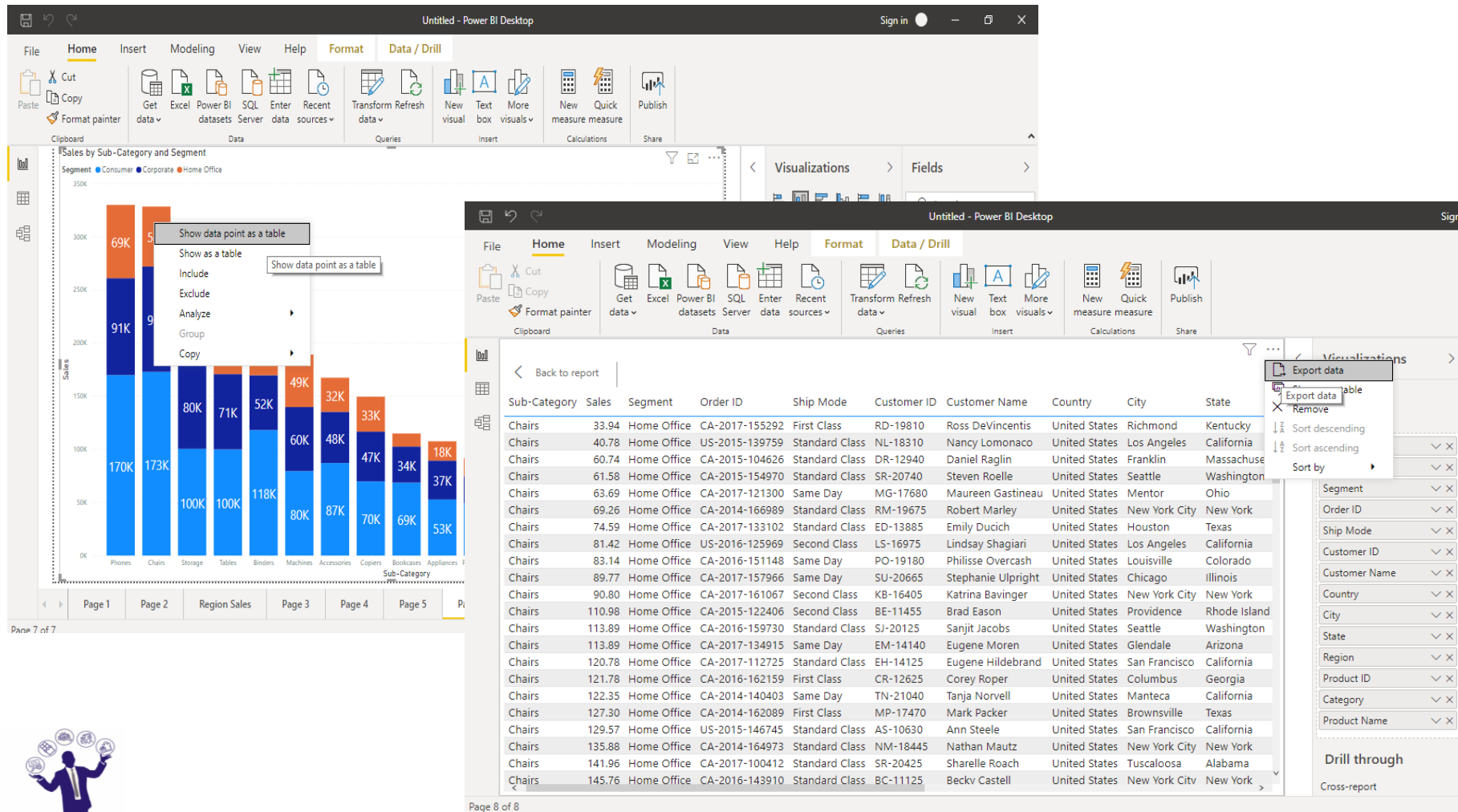
Include will filter out all points except for those you've chosen to include. Exclude will filter out the points you've chosen to exclude.



Basic Charts in Power BI

– Export Data from Chart

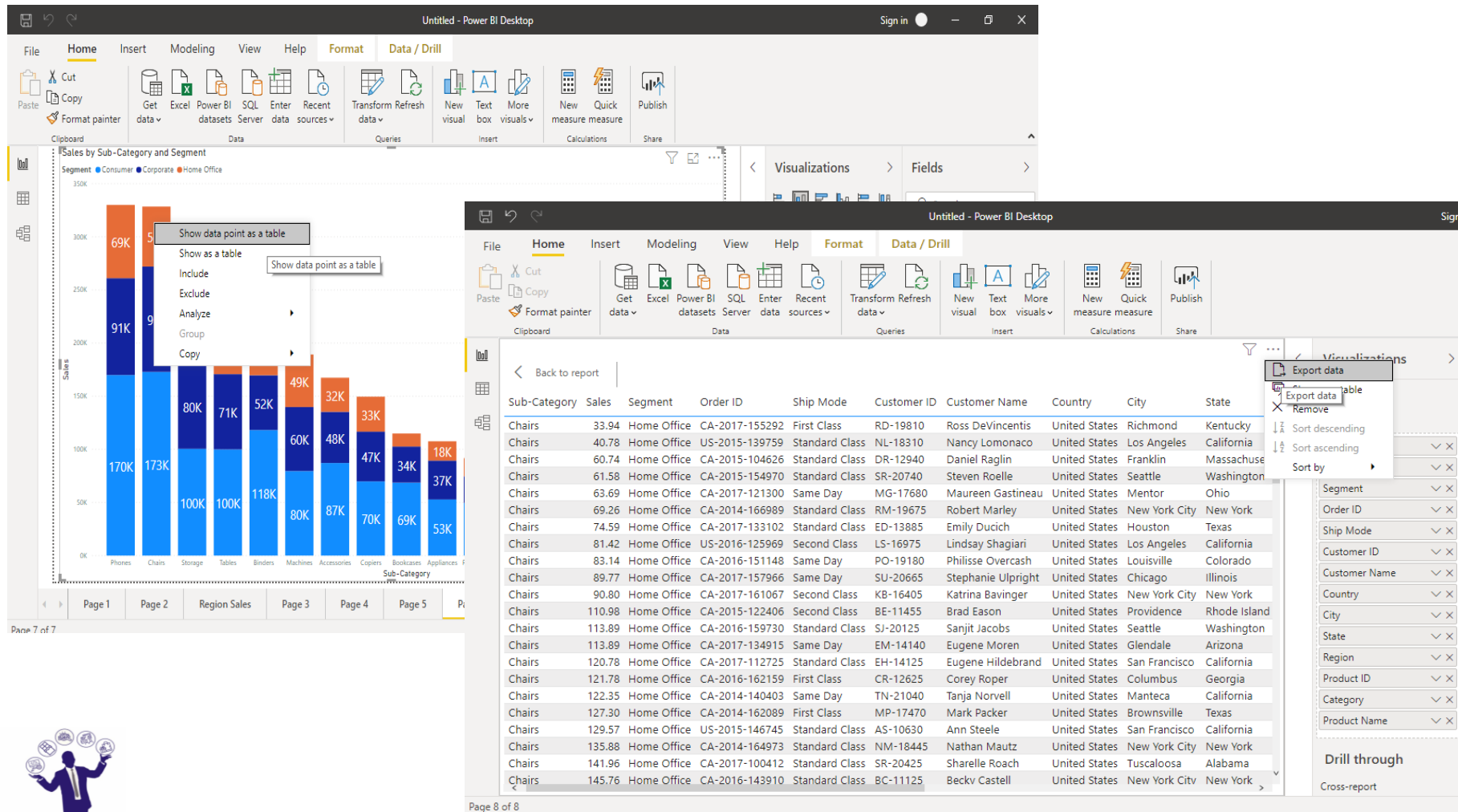
This feature allows you to export the detailed data directly from the chart



Basic Charts in Power BI

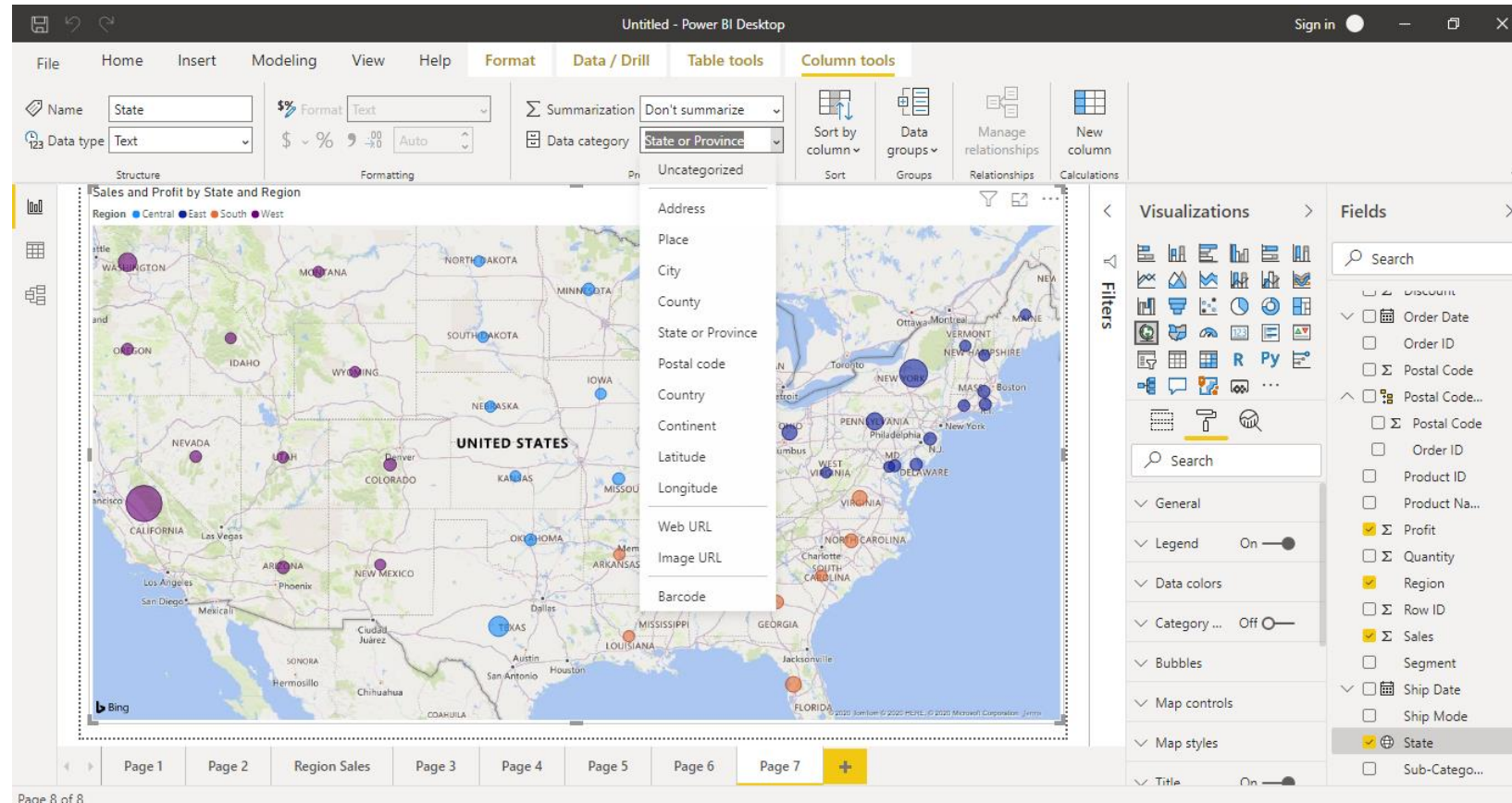
– Export Data from Chart

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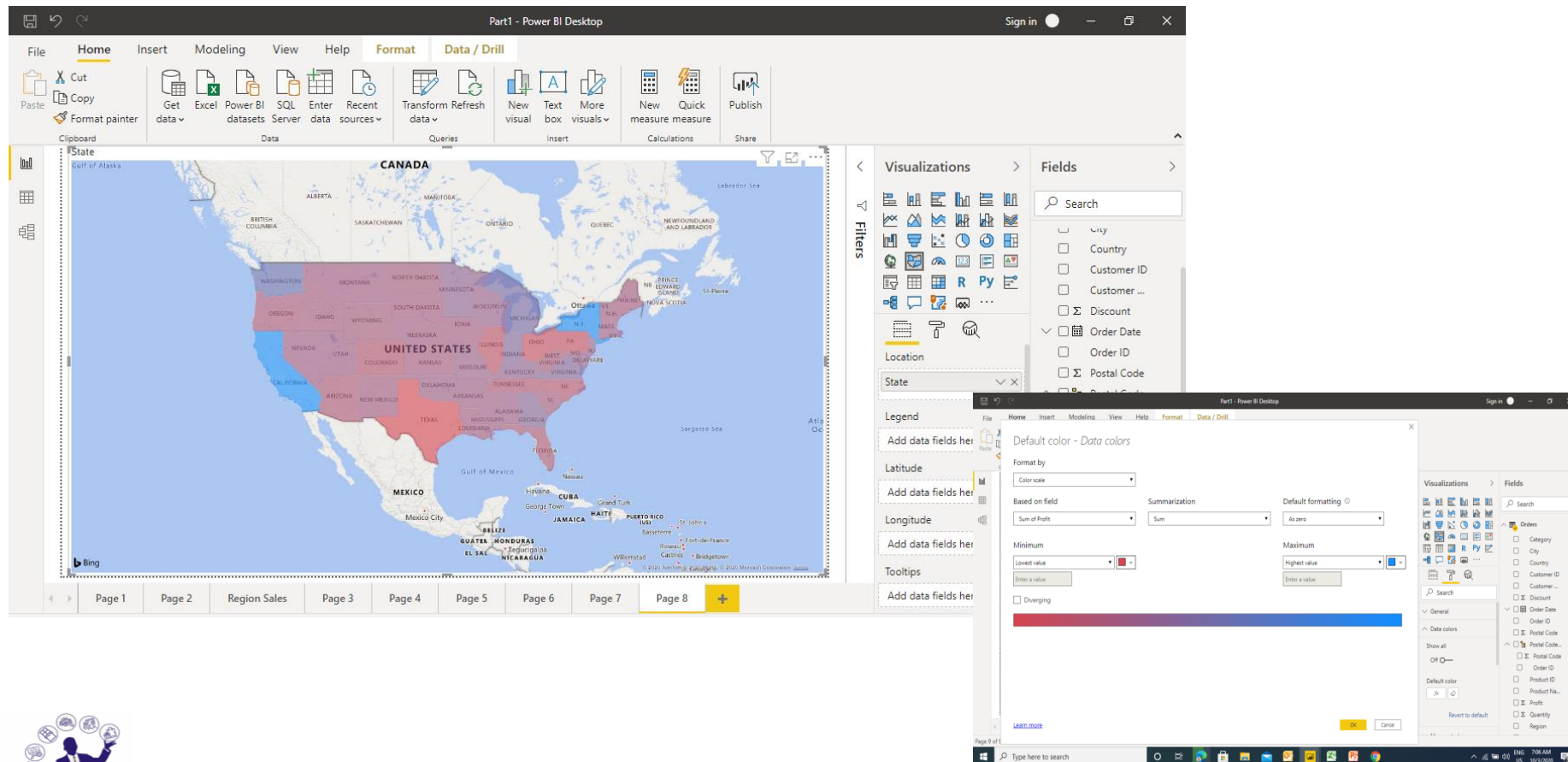
Map in Power BI

Power BI provides two types of map visualization - bubble maps and shape maps. To create a Map you need some geographical Data type such as Country , State, City , Postal code , Latitude, longitude etc..



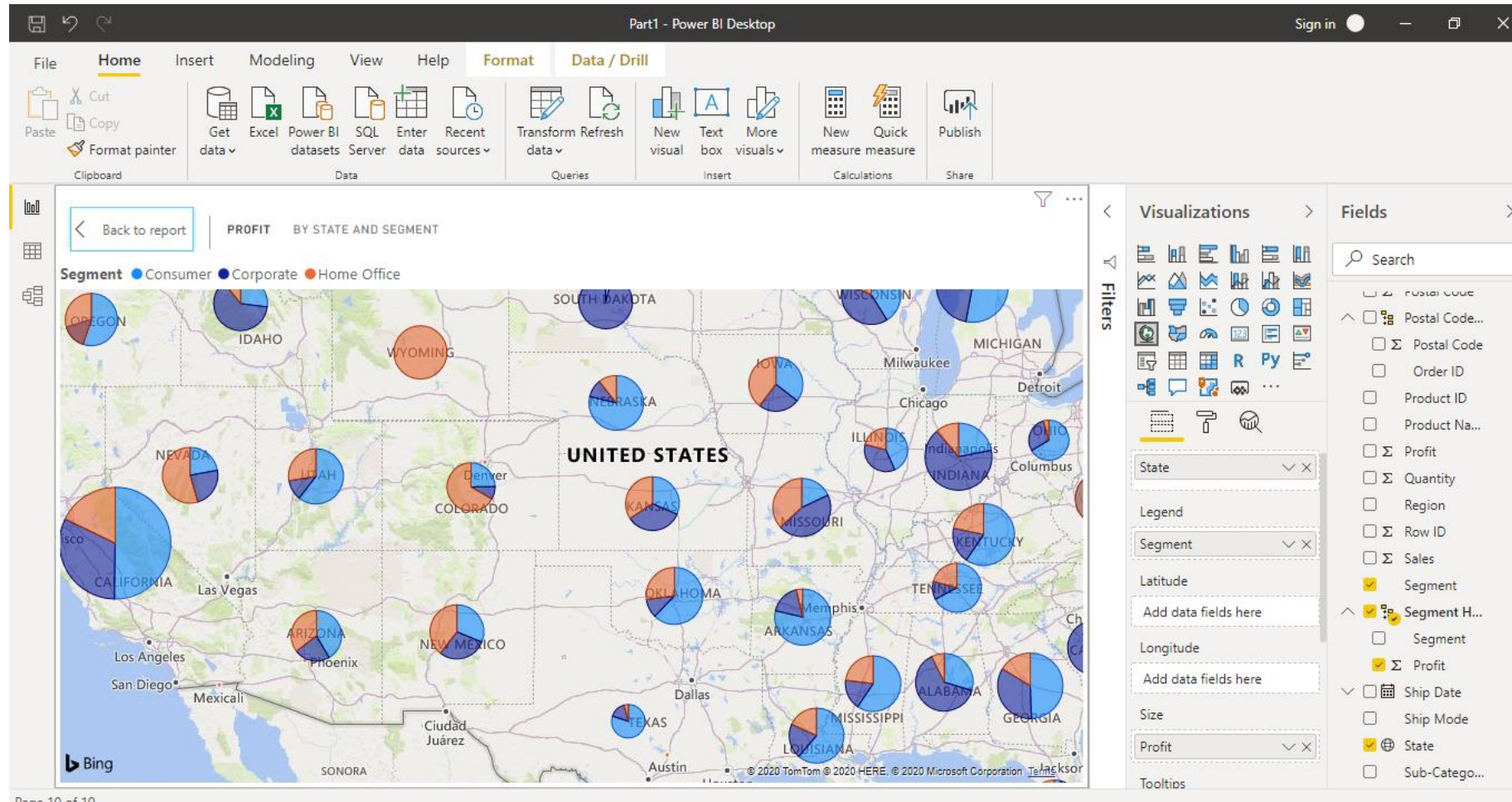
Map in Power BI - Filled Map

A filled map uses shading [from light (less-frequent/lower) to dark (more-frequent/more)] to display how a value differs in proportion across a geography or region.



Map in Power BI - Map with Pie

It a blend of Map & Pie where no. of Pie chart are plotted on the map



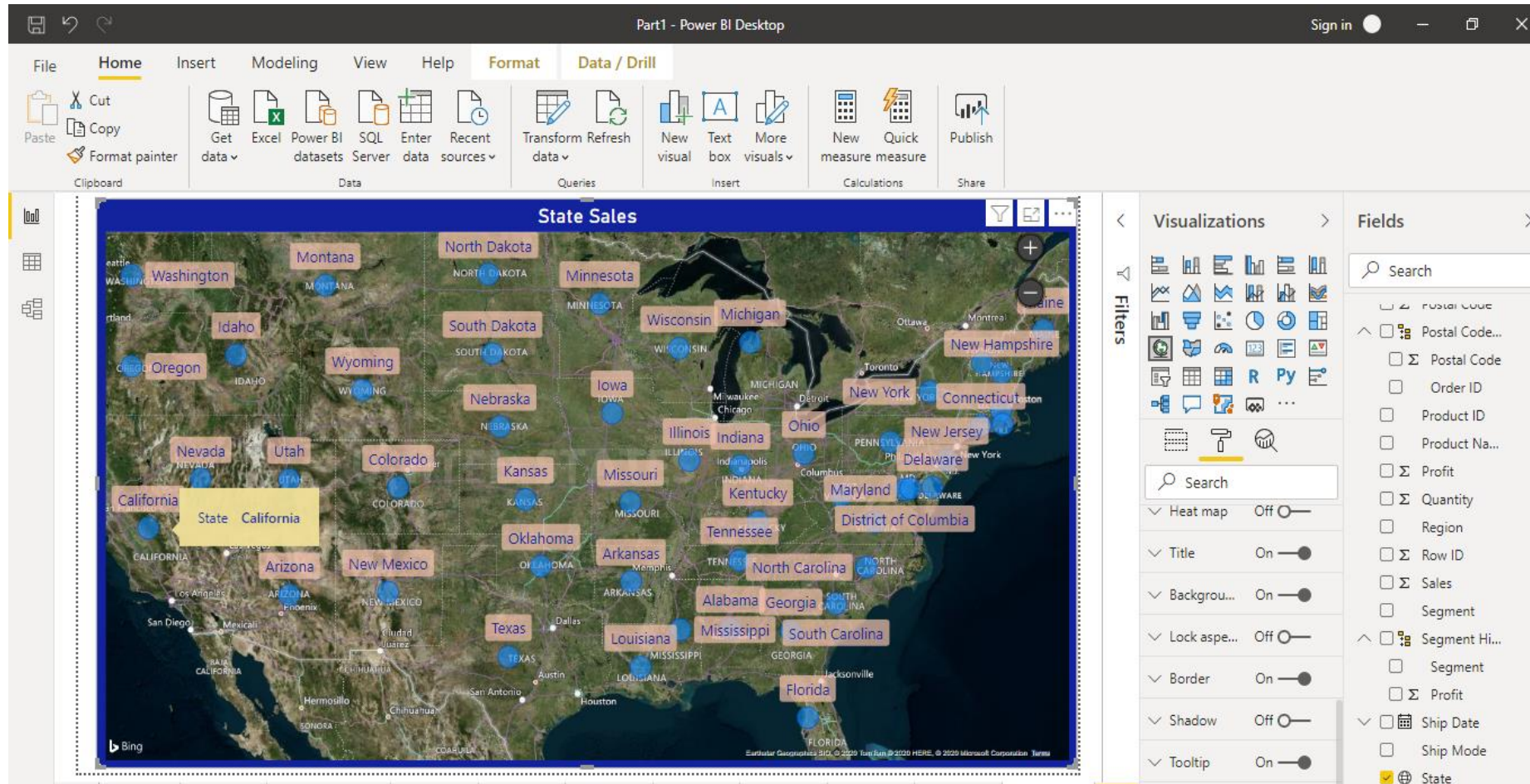
Map in Power BI - Formatting

Map Formatting options are available under Map controls to enhance the Map

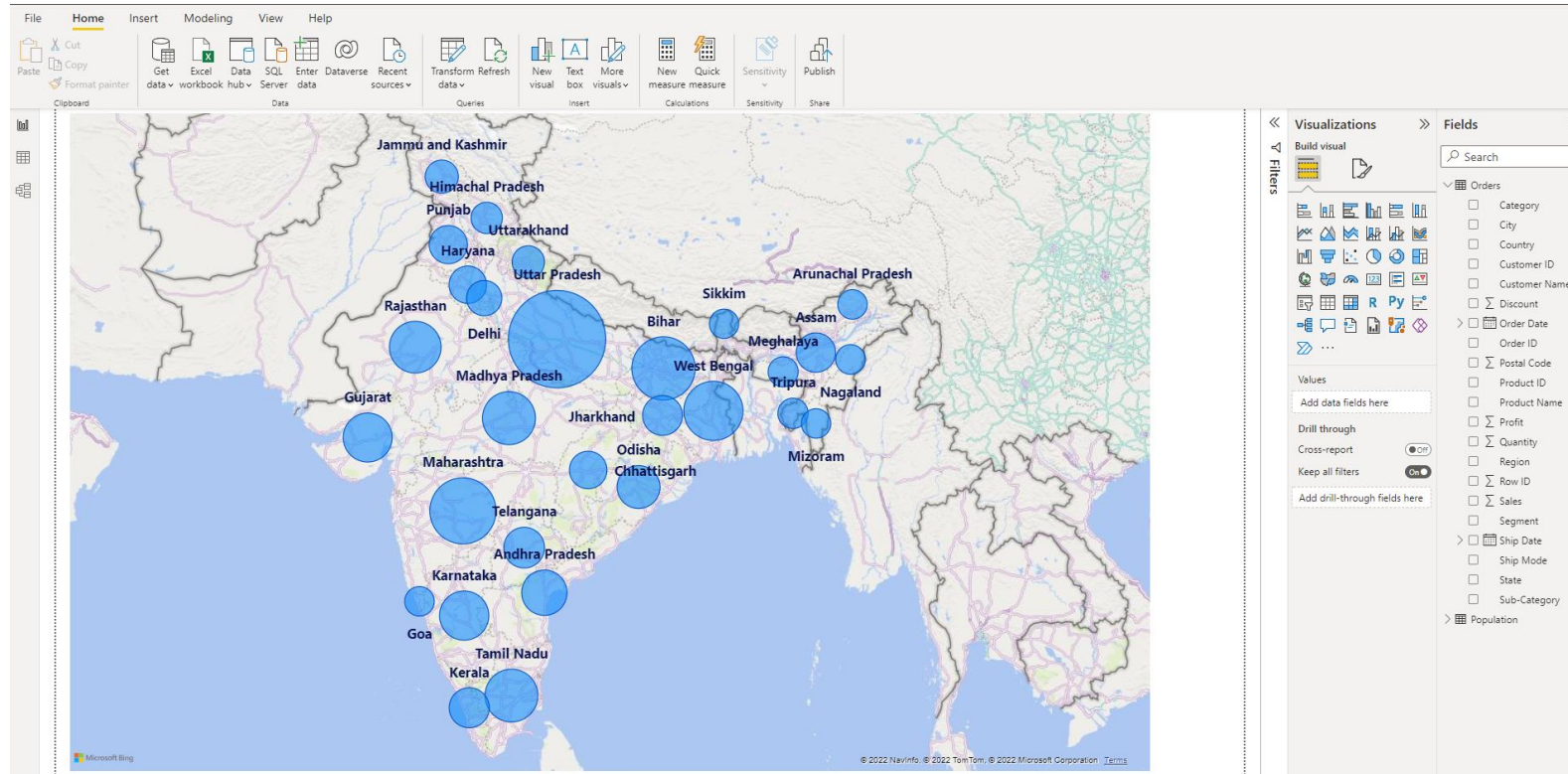
- Data Colors – change the color of data bubble
- Category – get the name of states
- Bubbles – change size of bubble
- Map Controls – Zoom in & Zoom Out Buttons
- Title – Map Title
- Tool Tip – format tool tip box
- Map Styles – change the map background



Map in Power BI - Formatting



Map in Power BI - India Map



Tabular Data in Power BI

- Tables

Use the Table under Visualizations and add the required fields in the Value box

The screenshot displays the Power BI Desktop interface. The main area shows a table visualization with the following data:

Sub-Category	Sales	Profit	Quantity
Accessories	167,380.32	41,936.64	2976
Appliances	107,532.16	18,138.01	1729
Art	27,118.79	6,527.79	3000
Binders	203,412.73	30,221.76	5974
Bookcases	114,880.00	-3,472.56	868
Chairs	328,449.10	26,590.17	2356
Copiers	149,528.03	55,617.82	234
Envelopes	16,476.40	6,964.18	906
Fasteners	3,024.28	949.52	914
Furnishings	91,705.16	13,059.14	3563
Labels	12,486.31	5,546.25	1400
Machines	189,238.63	3,384.76	440
Paper	78,479.21	34,053.57	5178
Phones	330,007.05	44,515.73	3289
Storage	223,843.61	21,278.83	3158
Supplies	46,673.54	-1,189.10	647
Tables	206,965.53	-17,725.48	1241
Total	2,297,200.86	286,397.02	37873

The right-hand pane shows the 'Visualizations' and 'Fields' sections. In the 'Visualizations' pane, the 'Table' icon is selected. In the 'Fields' pane, the 'Values' section contains the following fields: Sub-Category, Sales, Profit, and Quantity. The 'Filters' section is currently empty.



Tabular Data in Power BI

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Tabular Data in Power BI

-Formatting Tables

- Changing the Font size : Values → Text Size
- Changing the Column Header Size : Column Headers → Text Size
- Adding Grid : Grid - > Vertical Grid / Horizontal Grid
- Table Auto Format : Style -> Bold Header
- Field Formatting
- Back Ground Color
- Add title

Category Sub Category Details				
Category	Sub-Category	Profit	Sales	Quantity
Furniture	Bookcases	-3,472.56	114,880.00	868
Furniture	Chairs	26,590.17	328,449.10	2356
Furniture	Furnishings	13,059.14	91,705.16	3563
Furniture	Tables	-17,725.48	206,965.53	1241
Office Supplies	Appliances	18,138.01	107,532.16	1729
Office Supplies	Art	6,527.79	27,118.79	3000
Office Supplies	Binders	30,221.76	203,412.73	5974
Office Supplies	Envelopes	6,964.18	16,476.40	906
Office Supplies	Fasteners	949.52	3,024.28	914
Office Supplies	Labels	5,546.25	12,486.31	1400
Office Supplies	Paper	34,053.57	78,479.21	5178
Office Supplies	Storage	21,278.83	223,843.61	3158
Office Supplies	Supplies	-1,189.10	46,673.54	647
Technology	Accessories	41,936.64	167,380.32	2976
Technology	Copiers	55,617.82	149,528.03	234
Technology	Machines	3,384.76	189,238.63	440
Technology	Phones	44,515.73	330,007.05	3289
Total		286,397.02	2,297,200.86	37873



Tabular Data in Power BI

-Conditional Formatting

Formatting the data based on the condition is known as Conditional Formatting

Sub-Category	Sales	Profit	Discount
Copiers	149,528.03	55,617.82	11.00
Phones	330,007.05	44,515.73	137.40
Accessories	167,380.32	41,936.64	60.80
Paper	78,479.21	34,053.57	102.60
Binders	203,412.73	30,221.76	567.00
Chairs	328,449.10	26,590.17	105.00
Storage	223,843.61	21,278.83	63.20
Appliances	107,532.16	18,138.01	77.60
Furnishings	91,705.16	13,059.14	132.40
Envelopes	16,476.40	6,964.18	20.40
Art	27,118.79	6,527.79	59.60
Labels	12,486.31	5,546.25	25.00
Machines	189,238.63	3,384.76	35.20
Fasteners	3,024.28	949.52	17.80
Supplies	46,673.54	-1,189.10	14.60
Bookcases	114,880.00	-3,472.56	48.14
Tables	206,965.53	-17,725.48	83.35
Total	2,297,200.86	286,397.02	1,561.09

Profit

Background color

Off

Font color

Off

Data bars

Off

Icons

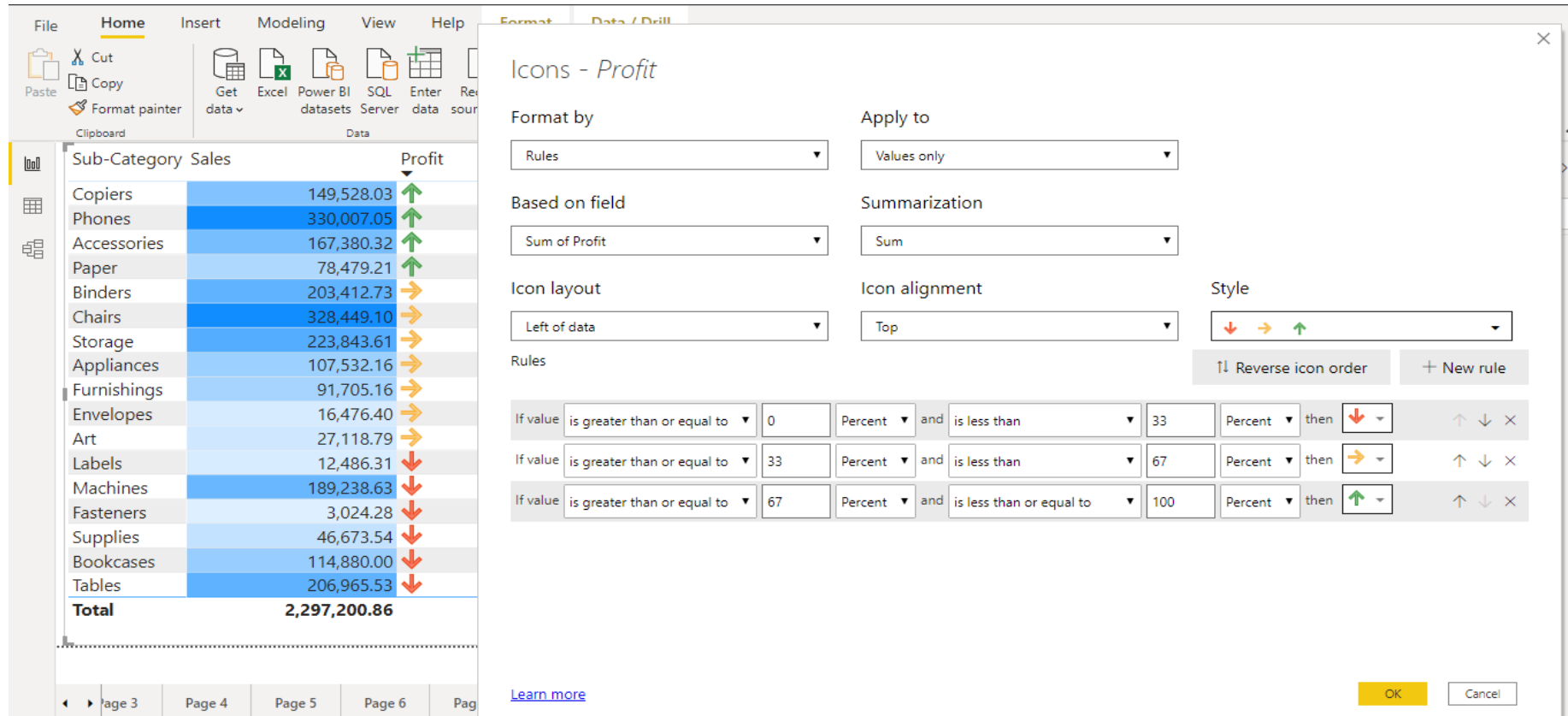
Off



Tabular Data in Power BI

-Conditional Formatting

Getting Icons



The screenshot displays the Power BI Desktop interface with a table of sales data. The 'Profit' column is highlighted, and the 'Icons - Profit' task pane is open, showing the configuration for conditional formatting. The task pane includes options for 'Format by' (Rules), 'Apply to' (Values only), 'Based on field' (Sum of Profit), 'Summarization' (Sum), 'Icon layout' (Left of data), 'Icon alignment' (Top), and 'Style' (Reverse icon order). The 'Rules' section shows three rules for the 'Profit' column, each with a condition and a corresponding icon (up, down, or right arrow).

Sub-Category	Sales	Profit
Copiers	149,528.03	↑
Phones	330,007.05	↑
Accessories	167,380.32	↑
Paper	78,479.21	↑
Binders	203,412.73	→
Chairs	328,449.10	→
Storage	223,843.61	→
Appliances	107,532.16	→
Furnishings	91,705.16	→
Envelopes	16,476.40	→
Art	27,118.79	→
Labels	12,486.31	↓
Machines	189,238.63	↓
Fasteners	3,024.28	↓
Supplies	46,673.54	↓
Bookcases	114,880.00	↓
Tables	206,965.53	↓
Total	2,297,200.86	

Learn more

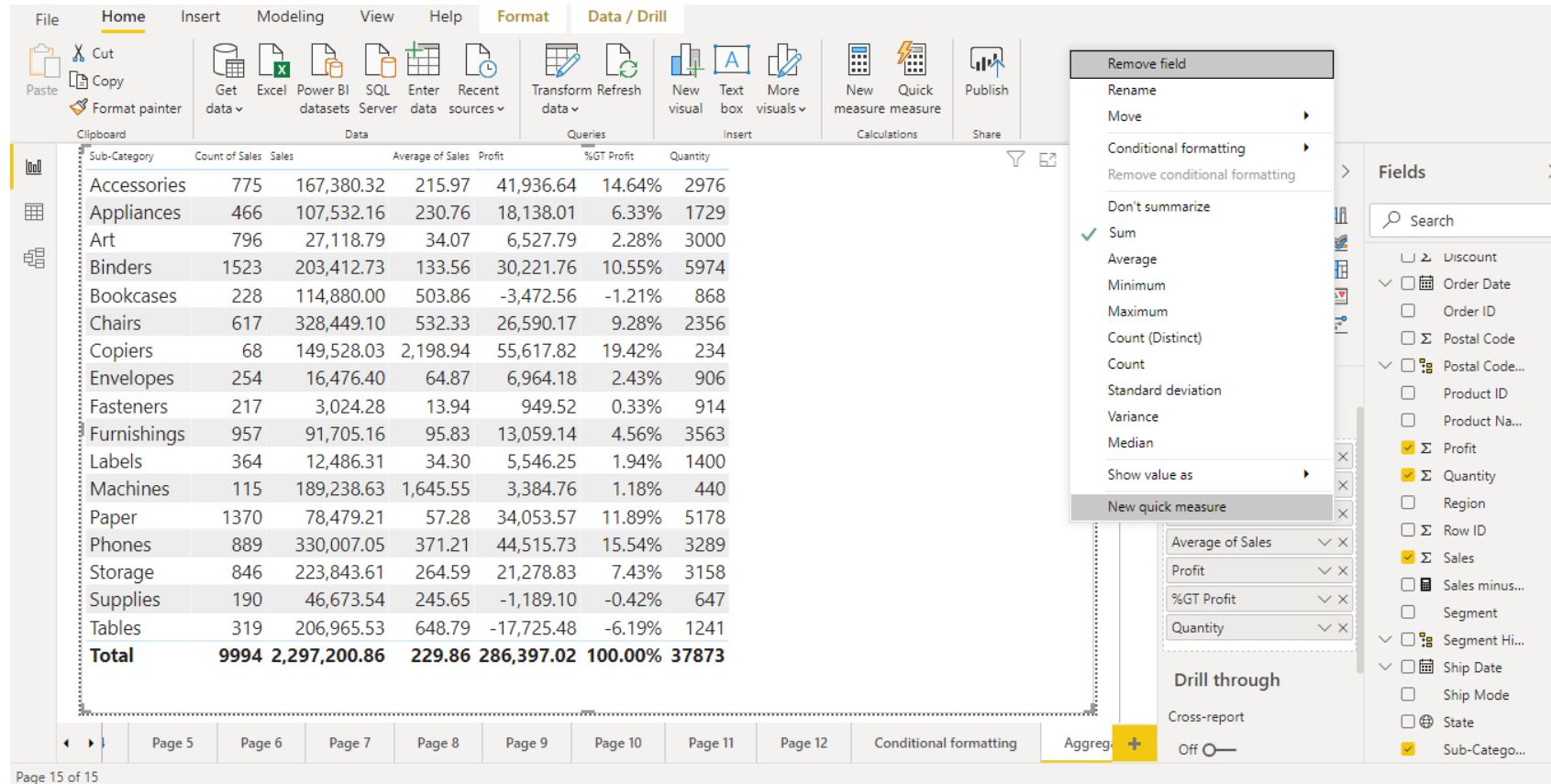
OK Cancel



Tabular Data in Power BI

-Table Aggregation

The default aggregation is sum, which can be changed to Avg, Count, etc.



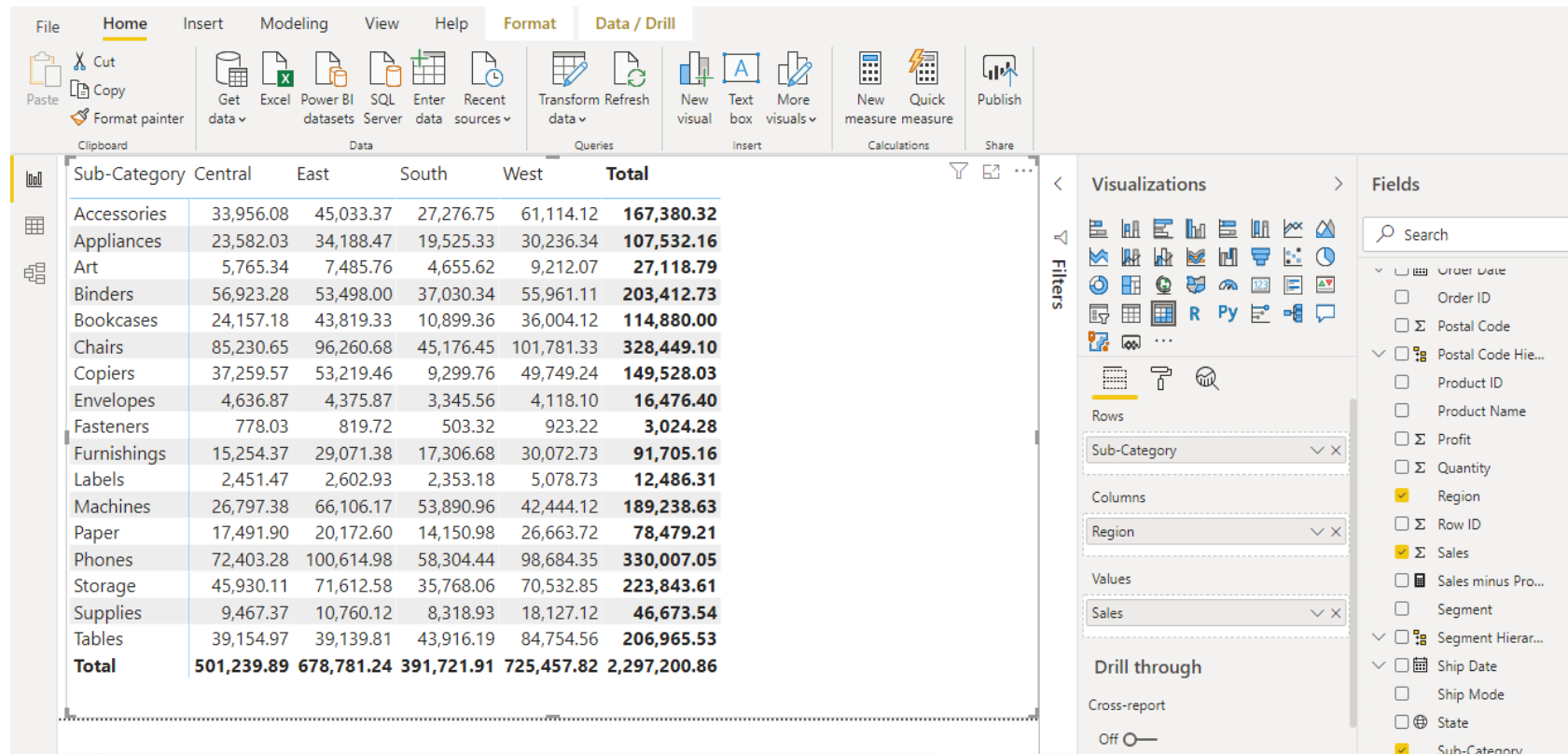
The screenshot displays the Power BI Desktop interface. The main area shows a table with columns: Sub-Category, Count of Sales, Sales, Average of Sales, Profit, %GT Profit, and Quantity. The table lists various product categories like Accessories, Appliances, Art, Binders, Bookcases, Chairs, Copiers, Envelopes, Fasteners, Furnishings, Labels, Machines, Paper, Phones, Storage, Supplies, Tables, and a Total row. A context menu is open over the table, showing aggregation options: Remove field, Rename, Move, Conditional formatting, Remove conditional formatting, Don't summarize, Sum (selected), Average, Minimum, Maximum, Count (Distinct), Count, Standard deviation, Variance, Median, Show value as, and New quick measure. The Fields pane on the right shows a list of fields with checkboxes for aggregation: Discount, Order Date, Order ID, Postal Code, Postal Code..., Product ID, Product Na..., Profit (checked), Quantity (checked), Region, Row ID, Sales (checked), Sales minus..., Segment, Segment Hi..., Ship Date, Ship Mode, State, and Sub-Catego... (checked). The bottom status bar indicates 'Page 15 of 15'.

Sub-Category	Count of Sales	Sales	Average of Sales	Profit	%GT Profit	Quantity
Accessories	775	167,380.32	215.97	41,936.64	14.64%	2976
Appliances	466	107,532.16	230.76	18,138.01	6.33%	1729
Art	796	27,118.79	34.07	6,527.79	2.28%	3000
Binders	1523	203,412.73	133.56	30,221.76	10.55%	5974
Bookcases	228	114,880.00	503.86	-3,472.56	-1.21%	868
Chairs	617	328,449.10	532.33	26,590.17	9.28%	2356
Copiers	68	149,528.03	2,198.94	55,617.82	19.42%	234
Envelopes	254	16,476.40	64.87	6,964.18	2.43%	906
Fasteners	217	3,024.28	13.94	949.52	0.33%	914
Furnishings	957	91,705.16	95.83	13,059.14	4.56%	3563
Labels	364	12,486.31	34.30	5,546.25	1.94%	1400
Machines	115	189,238.63	1,645.55	3,384.76	1.18%	440
Paper	1370	78,479.21	57.28	34,053.57	11.89%	5178
Phones	889	330,007.05	371.21	44,515.73	15.54%	3289
Storage	846	223,843.61	264.59	21,278.83	7.43%	3158
Supplies	190	46,673.54	245.65	-1,189.10	-0.42%	647
Tables	319	206,965.53	648.79	-17,725.48	-6.19%	1241
Total	9994	2,297,200.86	229.86	286,397.02	100.00%	37873



Tabular Data in Power BI-Matrix

The matrix is similar to a table. In table duplicate values are displayed and not aggregated. A matrix makes it easier to display data meaningfully across multiple dimensions -- it supports a stepped layout. The matrix automatically aggregates the data and enables drill down.

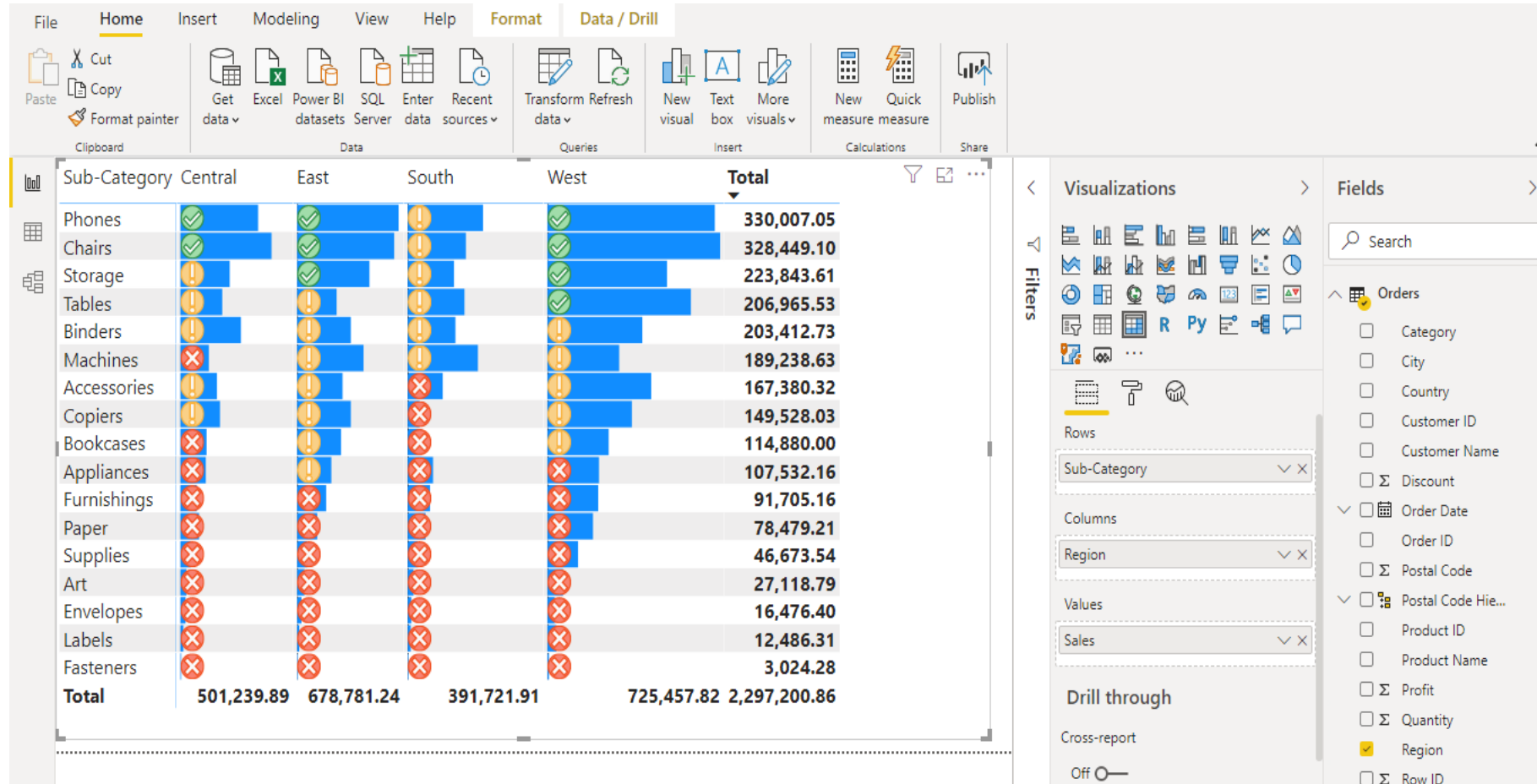


Sub-Category	Central	East	South	West	Total
Accessories	33,956.08	45,033.37	27,276.75	61,114.12	167,380.32
Appliances	23,582.03	34,188.47	19,525.33	30,236.34	107,532.16
Art	5,765.34	7,485.76	4,655.62	9,212.07	27,118.79
Binders	56,923.28	53,498.00	37,030.34	55,961.11	203,412.73
Bookcases	24,157.18	43,819.33	10,899.36	36,004.12	114,880.00
Chairs	85,230.65	96,260.68	45,176.45	101,781.33	328,449.10
Copiers	37,259.57	53,219.46	9,299.76	49,749.24	149,528.03
Envelopes	4,636.87	4,375.87	3,345.56	4,118.10	16,476.40
Fasteners	778.03	819.72	503.32	923.22	3,024.28
Furnishings	15,254.37	29,071.38	17,306.68	30,072.73	91,705.16
Labels	2,451.47	2,602.93	2,353.18	5,078.73	12,486.31
Machines	26,797.38	66,106.17	53,890.96	42,444.12	189,238.63
Paper	17,491.90	20,172.60	14,150.98	26,663.72	78,479.21
Phones	72,403.28	100,614.98	58,304.44	98,684.35	330,007.05
Storage	45,930.11	71,612.58	35,768.06	70,532.85	223,843.61
Supplies	9,467.37	10,760.12	8,318.93	18,127.12	46,673.54
Tables	39,154.97	39,139.81	43,916.19	84,754.56	206,965.53
Total	501,239.89	678,781.24	391,721.91	725,457.82	2,297,200.86



Tabular Data in Power BI-Matrix

Conditional formatting matrix.



Tabular Data in Power BI- Matrix Hierarchies

Hierarchies gives expand & collapse feature to a field. You just need to drop one field over another to get the hierarchy

File Home Insert Modeling View Help Format Data / Drill

Clipboard Data Queries Insert Calculations Share

Drill on Rows

Year	2014								
Region	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Total	Qtr 1	Qtr 2	Qtr 3	
East	6,579.34	21,064.17	33,443.38	67,593.57	128,680.46	17,145.87	22,703.21	50,77	
Consumer	1,682.58	14,984.71	21,135.88	38,700.40	76,503.56	9,174.95	15,616.44	30,45	
Furniture	512.15	5,163.78	8,562.90	12,440.52	26,679.35	3,136.44	2,500.13	14,39	
Bookcases		703.53	1,164.51	4,891.76	6,759.80	283.92		9,61	
Chairs	366.79	3,124.77	5,232.67	5,574.15	14,298.38	1,834.41	2,357.29	2,57	
Furnishings	145.36	269.06	848.33	1,042.81	2,305.56		142.84	69	
Tables		1,066.42	1,317.38	931.81	3,315.61	1,018.10		1,50	
Office Supplies	566.26	3,472.16	4,944.79	7,128.65	16,111.86	4,304.46	7,130.40	6,97	
Appliances		353.97	734.10	1,035.16	2,123.23	3.55	1,185.39	40	
Art	161.62	165.01	171.17	110.48	608.28	306.82	141.17	37	
Binders	76.44	661.49	499.22	2,657.80	3,894.95	3,257.58	4,336.34	2,33	
Envelopes		66.30	214.71	308.86	589.87	52.26	6.21	13	
Fasteners	10.46		40.10	3.76	54.32			6	
Labels	30.07		108.48	186.91	325.46	19.67	90.38	16	
Paper	269.05	543.48	437.88	388.35	1,638.75	101.18	144.38	38	
Storage		1,676.88	2,627.63	2,139.34	6,443.85	563.40	813.00	2,37	
Supplies	18.62	5.04	111.48	297.98	433.13		413.53	72	
Total	6,579.34	21,064.17	33,443.38	67,593.57	128,680.46	17,145.87	22,703.21	50,77	

Visualizations

Filters

Rows

- Region
- Segment
- Category
- Sub-Category

Columns

- Order Date
 - Year
 - Quarter
 - Month
 - Day

Fields

- Orders
 - Category
 - City
 - Country
 - Customer ID
 - Customer Name
 - Discount
 - Order Date
 - Order ID
 - Postal Code
 - Postal Code Hierarchy
 - Product ID
 - Product Name
 - Profit
 - Quantity
 - Region
 - Row ID



Tabular Data in Power BI- Matrix Formatting Totals

File Home Insert Modeling View Help Format Data / Drill

Paste Cut Copy Format painter Get data Excel Power BI SQL Enter data Recent sources Transform Refresh data New visual Text box More visuals New Quick measure measure Publish

Clipboard Data Queries Insert Calculations Share

Category	Central	East	South	West	Total
Furniture	163,797.16	208,291.20	117,298.68	252,612.74	741,999.80
Bookcases	24,157.18	43,819.33	10,899.36	36,004.12	114,880.00
Chairs	85,230.65	96,260.68	45,176.45	101,781.33	328,449.10
Furnishings	15,254.37	29,071.38	17,306.68	30,072.73	91,705.16
Tables	39,154.97	39,139.81	43,916.19	84,754.56	206,965.53
Office Supplies	167,026.42	205,516.06	125,651.31	220,853.25	719,047.03
Appliances	23,582.03	34,188.47	19,525.33	30,236.34	107,532.16
Art	5,765.34	7,485.76	4,655.62	9,212.07	27,118.79
Binders	56,923.28	53,498.00	37,030.34	55,961.11	203,412.73
Envelopes	4,636.87	4,375.87	3,345.56	4,118.10	16,476.40
Fasteners	778.03	819.72	503.32	923.22	3,024.28
Labels	2,451.47	2,602.93	2,353.18	5,078.73	12,486.31
Paper	17,491.90	20,172.60	14,150.98	26,663.72	78,479.21
Storage	45,930.11	71,612.58	35,768.06	70,532.85	223,843.61
Supplies	9,467.37	10,760.12	8,318.93	18,127.12	46,673.54
Technology	170,416.31	264,973.98	148,771.91	251,991.83	836,154.03
Accessories	33,956.08	45,033.37	27,276.75	61,114.12	167,380.32
Copiers	37,259.57	53,219.46	9,299.76	49,749.24	149,528.03
Total	501,239.89	678,781.24	391,721.91	725,457.82	2,297,200.86

Visualizations Fields

Search

Orders

- ☒ Category
- ☐ City
- ☐ Country
- ☐ Customer ID
- ☐ Customer Name
- ☐ Discount
- ☐ Order Date
- ☐ Order ID
- ☐ Postal Code
- ☐ Postal Code Hie...
- ☐ Product ID
- ☐ Product Name
- ☐ Profit
- ☐ Quantity
- ☒ Region
- ☐ Row ID
- ☒ Sales

Subtotals

Row subtotals

On

Row subtotals label

Total

Column subtotals

On

Column subtotals label

Total

Page 9 Page 10 Page 11 Page 12 Conditional formatting Aggregation Matrix Page 13 Page 14

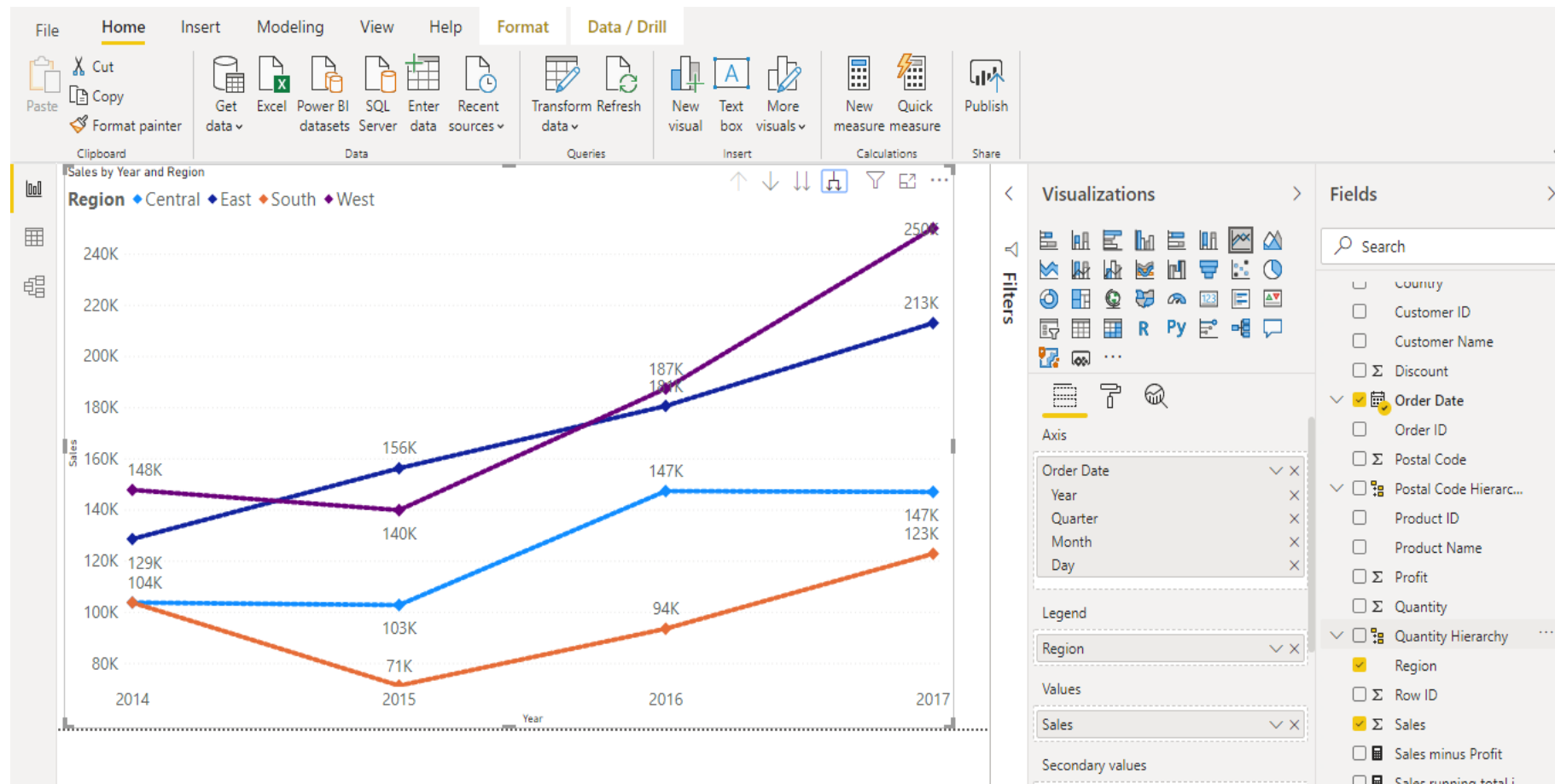
Page 18 of 18

4 new notifications



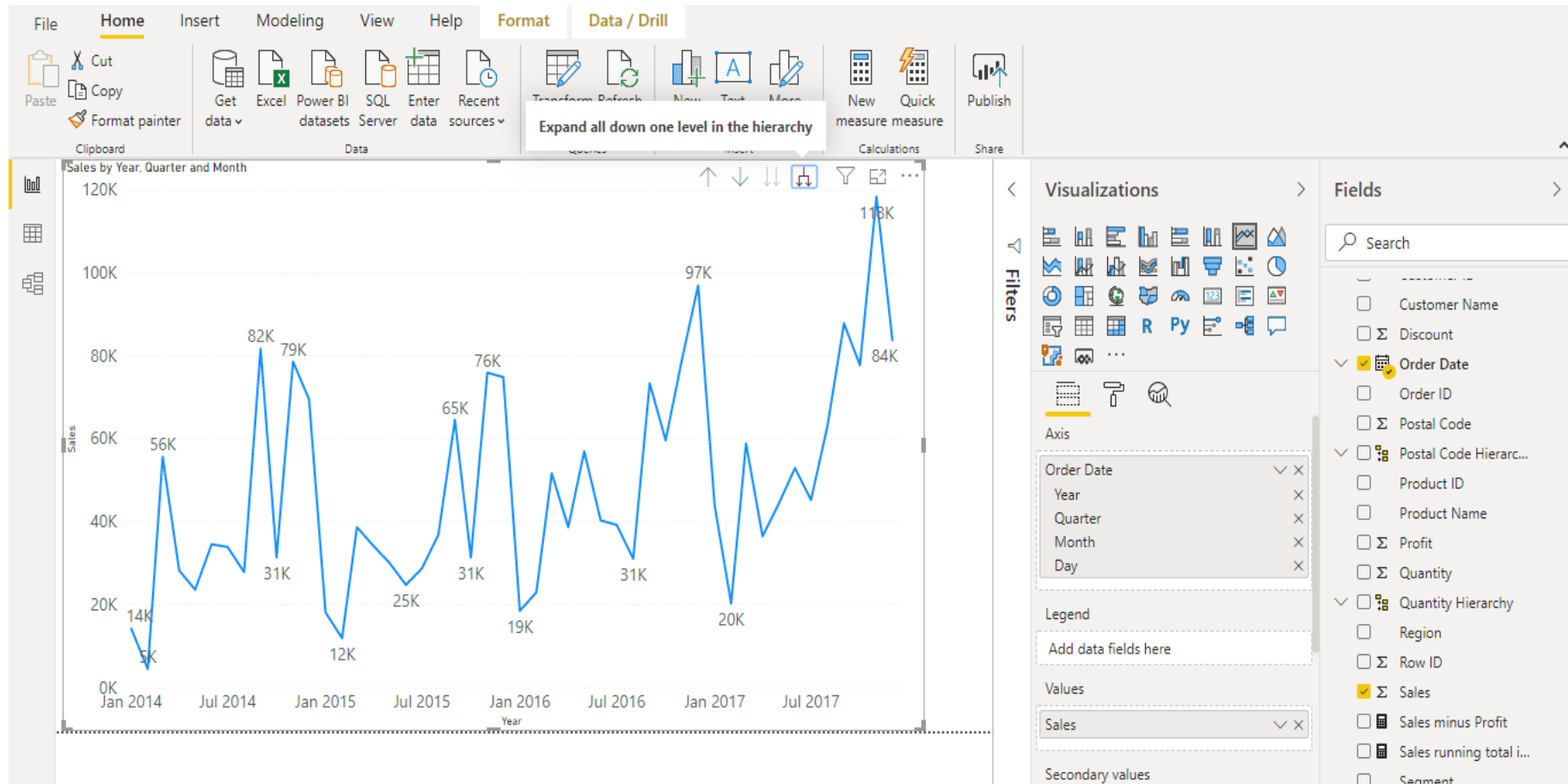
Line Chart in Power BI

To create a line chart we need to have a date field



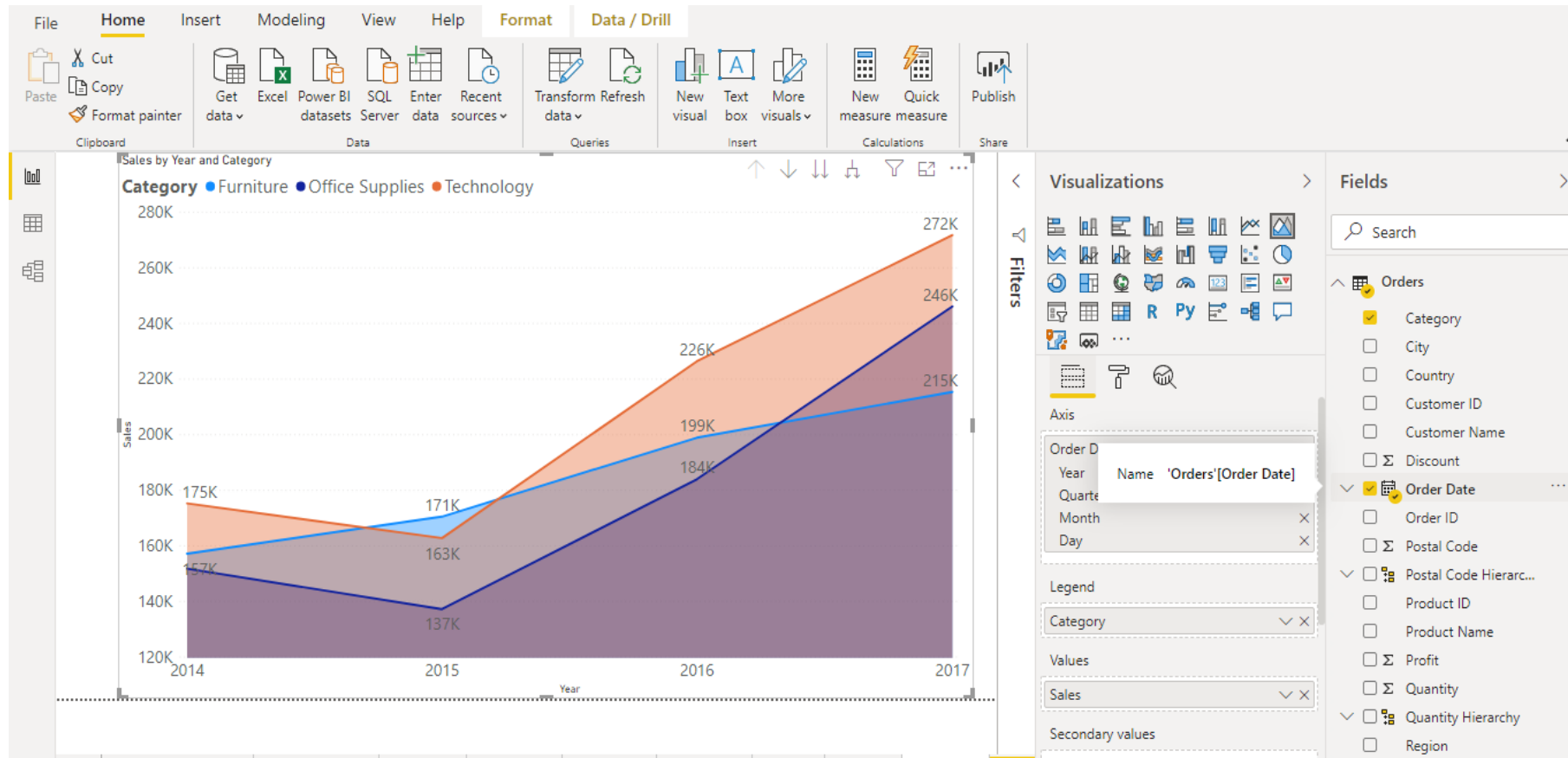
Line Chart in Power BI

As the date field has been used in Line Chart it also gives the feature of Auto Hierarchy



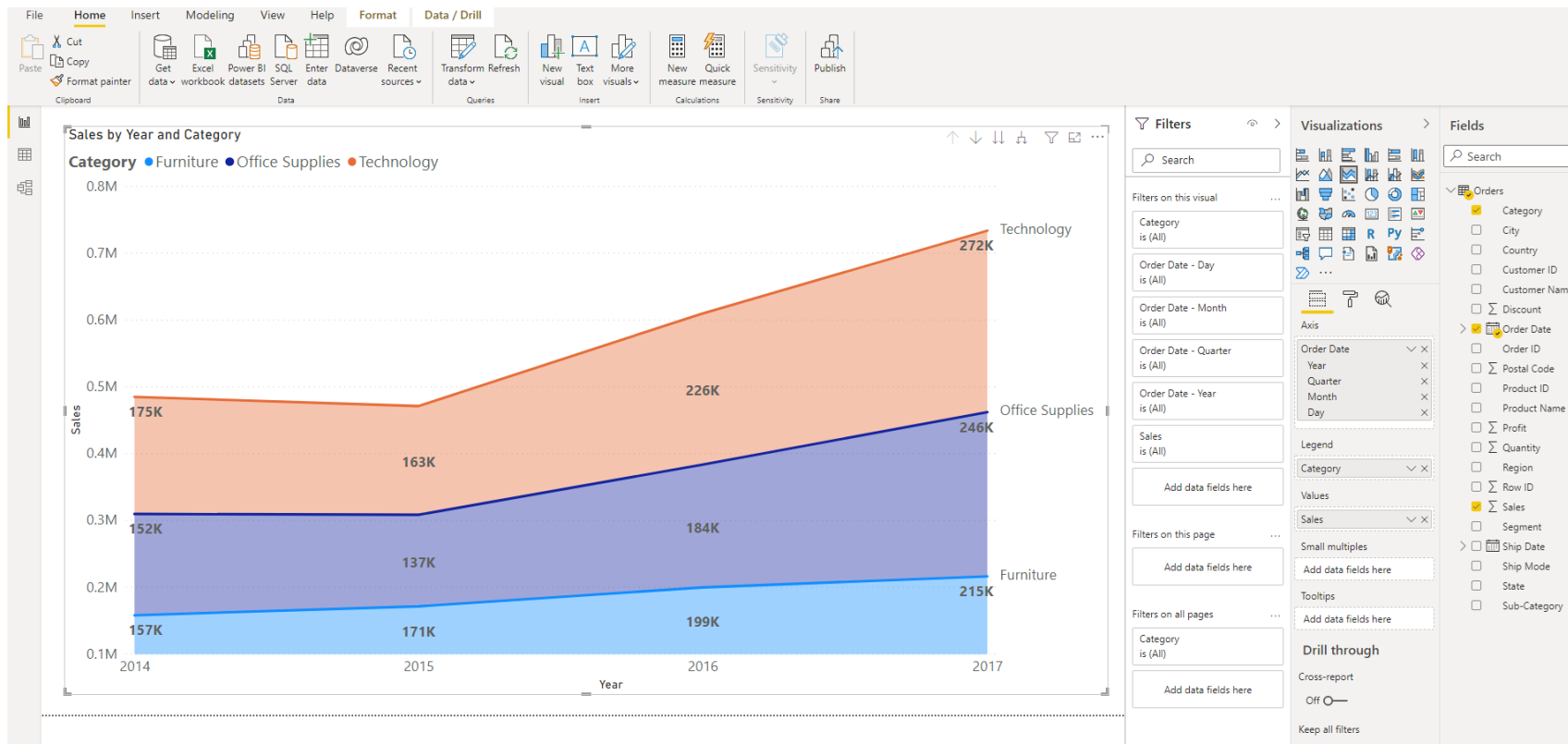
Area Chart in Power BI

Area Chart is the enhancement of line chart where the area below the line is filled



Stacked Area Chart in Power BI

Area Chart is the enhancement of line chart where the area below the line is filled



Basic Charts in Power BI

–100% Stacked Bar Chart

