



Data Analytics & MS Power BI

Foundation Level

POWER BI is a "Self Service" Business Intelligence Application

It is Microsoft's Business Analytics Service, enabling the ordinary user to create stunning visuals and Dashboards

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POWER BI - FOUNDATION

1. Hands-on Project 1

Your boss wants to see a report on performance regarding ATM Cards. They've requested for an executive summary of:

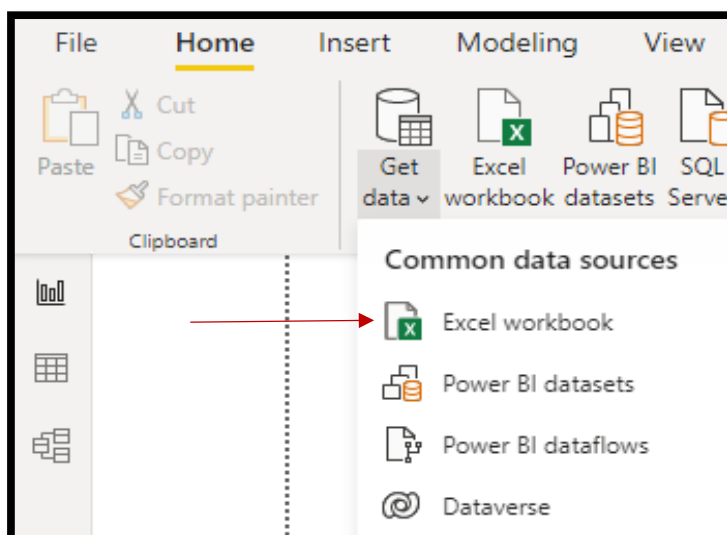
- a. Which month had the most profit?
- b. Where is the bank seeing the most success (by Region)?
- c. Which ATM card type and segment should the bank continue to invest in?

2. Formatting Data as Table

1. Open the Excel workbook containing your data.
2. Select a single cell in the data, Press Ctrl + T and click OK.
3. Rename the Table under Table Name.
4. Save and close the workbook.

3. Get Data

1. Open Power BI Desktop.
2. In the Data group under the Home ribbon, select Excel Workbook.



3. Navigate to where you saved your data, and select Open.

4. Data Transformation

In Navigator, you have the option to transform or load the data. The Navigator provides a preview of your data so you can verify that you have the correct range of data.

Numeric data types are italicized. To make changes you need to **Transform** your data before loading.

As you carry out various transformations, each transformation will be listed under Query Settings in Applied Steps.

Navigator

Display Options ▾

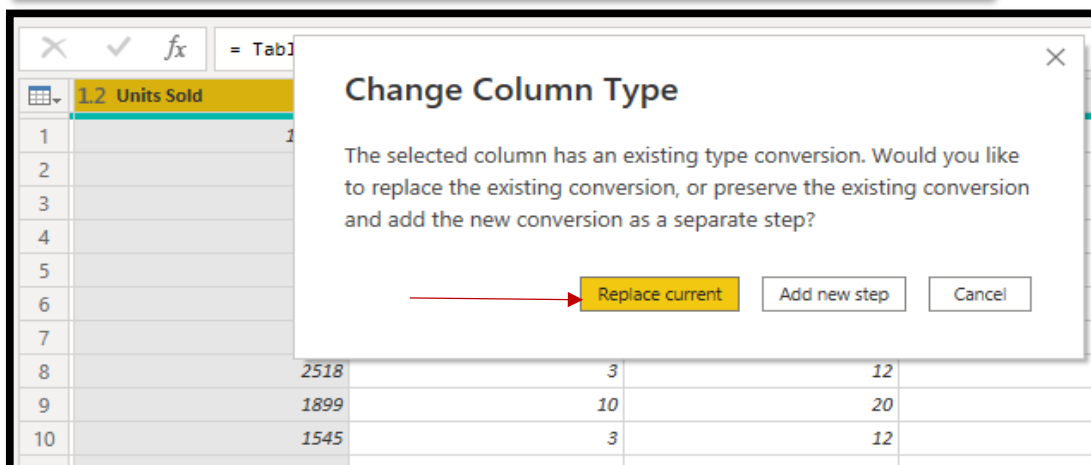
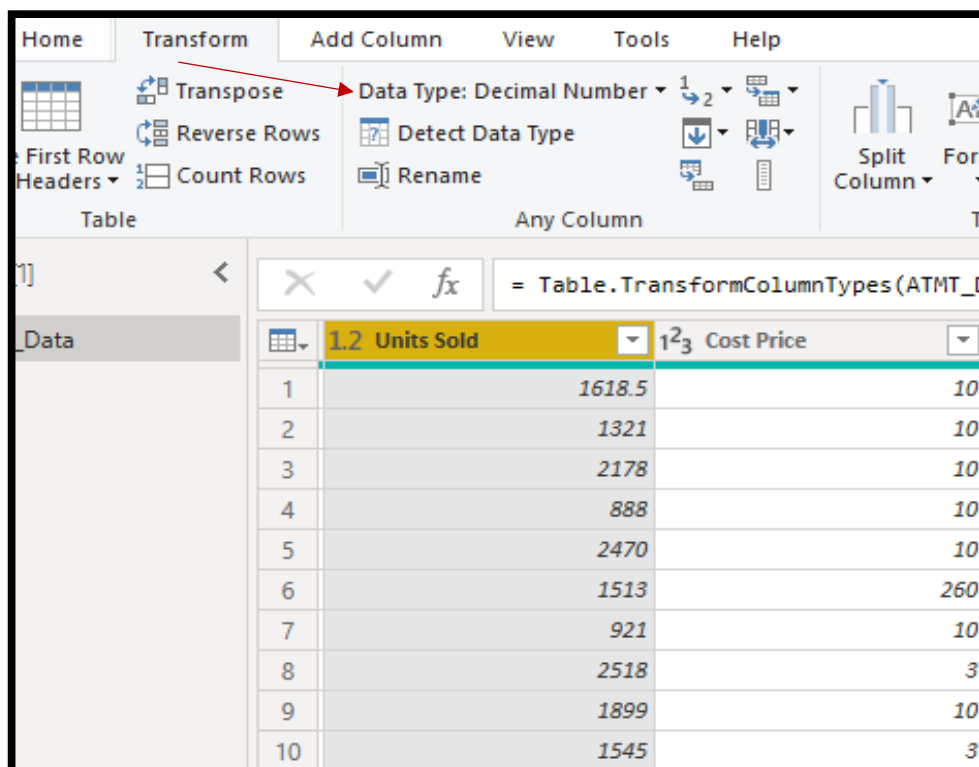
- ATMT.xlsx [4]
 - ☒ ATMT_Data
 - ☐ Regions_
 - ☐ FinData
 - ☐ Regions

ATMT_Data

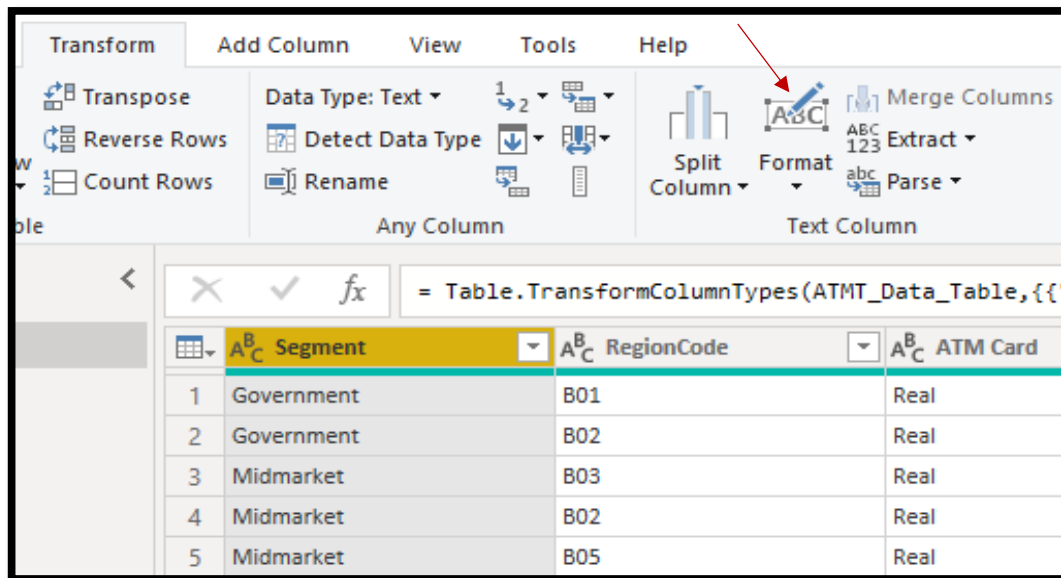
Segment	RegionCode	ATM Card	Discount Band	Units Sold
Government	B01	Real	None	1618
Government	B02	Real	None	13.
Midmarket	B03	Real	None	21
Midmarket	B02	Real	None	8.
Midmarket	B05	Real	None	24
Government	B02	Real	None	15
Midmarket	B02	Natural	None	9.
Channel Partners	B01	Natural	None	25
Government	B03	Natural	None	18.
Channel Partners	B02	Natural	None	15.
Midmarket	B05	Natural	None	24
Enterprise	B01	Natural	None	2665
Small Business	B05	Natural	None	9.
Government	B02	Natural	None	21.
Enterprise	B01	Natural	None	3.
Midmarket	B09	Natural	None	6
Government	B01	Alpha	None	2.
Midmarket	B05	Alpha	None	9
Channel Partners	B01	Alpha	None	25
Government	B02	Alpha	None	10.
Channel Partners	B02	Alpha	None	3.
Government	B05	Alpha	None	8.
Midmarket	B03	Alpha	None	5.

Load Transform Data Cancel

- T1:** a. Select the ATM_Transactions table, and choose Transform Data.
- b. Select the **Units Sold** column.
- c. On the **Transform tab**, select **Data Type**, then select Whole Number.
(as Whole number is more appropriate than in Decimals)
- d. Choose **Replace current** to change the column type.



- T2:** a. Select the **Segment** column.
- b. On the **Transform tab**, select **Format**, then select UPPERCASE.
(to make the segments easier to see in the chart later)

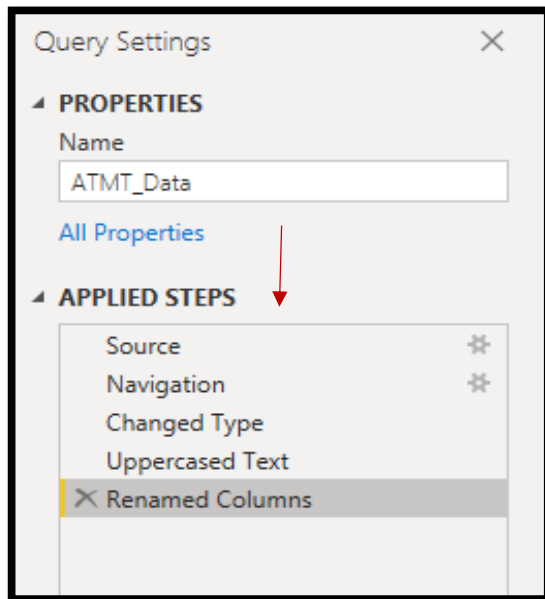


- T3:** a. Double-click the **Month Name** column.
- b. Rename to just Month.

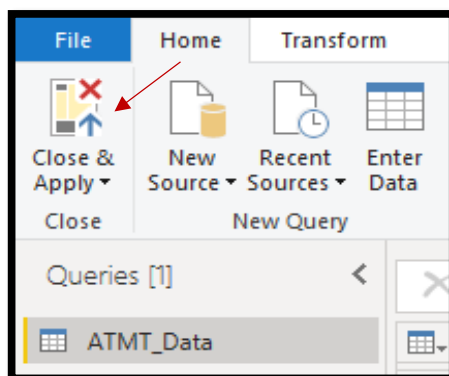
The screenshot shows the Power BI data view with the 'Month Name' column selected. A red arrow points to the 'Month Name' column header. The data shows a list of 'Jan' entries for the year 2021.

	Month Name	Year
1	Jan	2021
1	Jan	2021
1	Jan	2021
1	Jan	2021
1	Jan	2021
1	Jan	2021
1	Jan	2021
1	Jan	2021
1	Jan	2021
1	Jan	2021
1	Jan	2021
1	Jan	2021

Note that each transformation has been added to the list under Query Settings in Applied Steps.

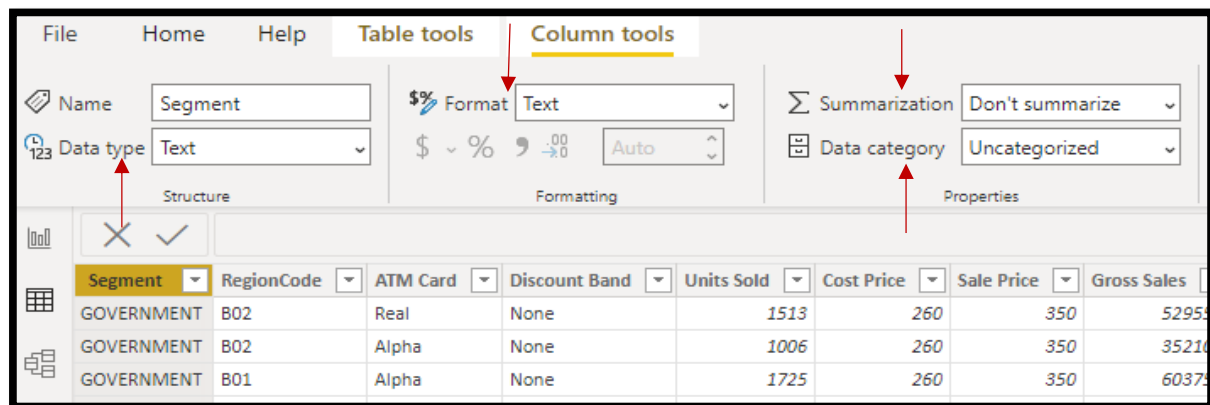


To Apply Transformations done so far:
Under the **Home** tab, select **Close & Apply**.



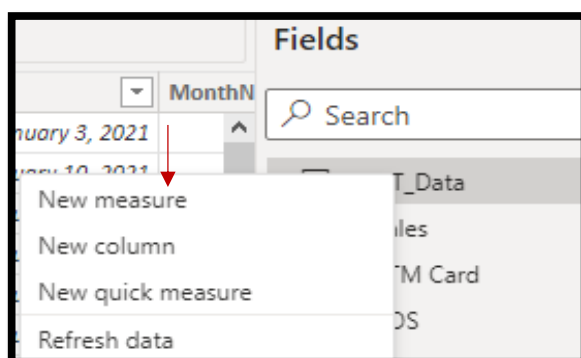
5. Check all the Columns in Table

1. Select the **Column tools** tab.
2. Click on each column header in the ATM_Transactions and check if they are of the correct Data type, Format, Summarization & Data category.



6a. Write a New Measure using DAX Expression

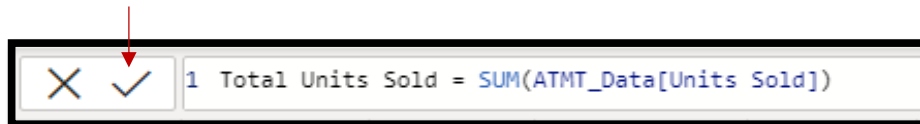
- a. Under the **Home tab** ribbon, select **New measure**.
(Alternatively Right-Click on the Table in which you want to create the New Measure)



- b. To add the numbers in the **Units Sold** column type this expression:

Total Units Sold = SUM(ATM_Transactions[Units Sold])

- c. Select the check mark to commit.



6b. Write a New Measure using DAX Expression

- a. Under the **Home tab** ribbon, select **New measure**.
 b. To calculate **Total Sales** type this expression:

Total Sales = SUM(ATM_Transactions[Sales])

- c. Select the check mark to commit.

6c. Write a New Measure using DAX Expression

- a. Under the **Home tab** ribbon, select **New measure**.
 b. To calculate **Total Profit** type this expression:

Total Profit = SUM(ATM_Transactions[Profit])

- c. Select the check mark to commit.

6d. Write a New Measure using DAX Expression

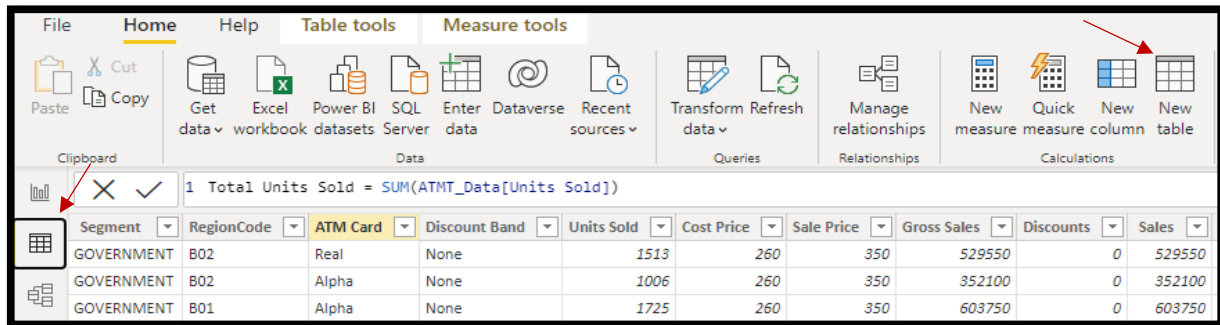
- a. Under the **Home tab** ribbon, select **New measure**.
 b. To calculate **Profit Margin** type this expression:

Profit Margin = ATM_Transactions[Total Profit]/ ATM_Transactions[Total Sales]

- c. Select the check mark to commit.

7. Create a Calendar table using DAX Expression

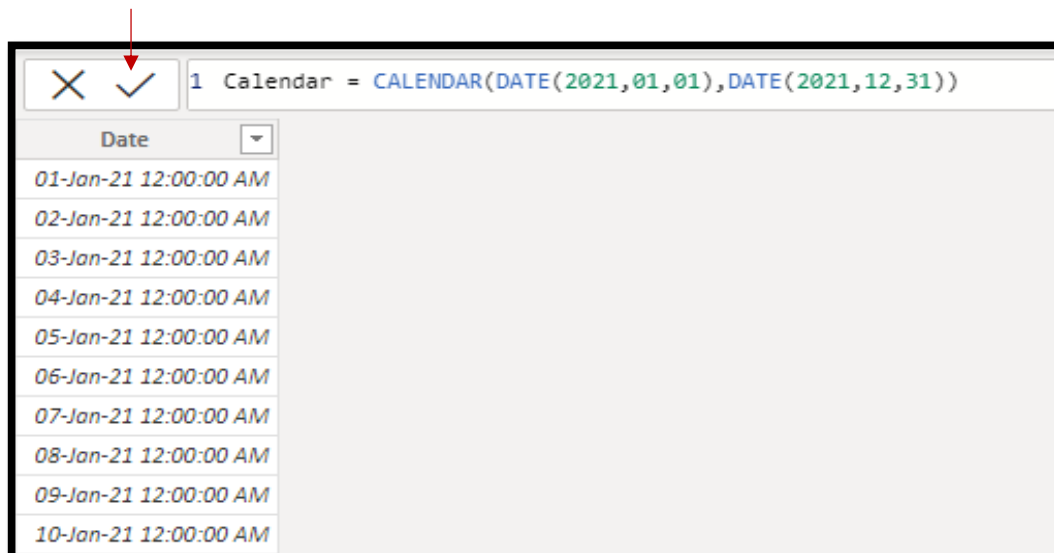
- Select the **Data** view on the left.
- Under the **Home** tab, select **New table**.



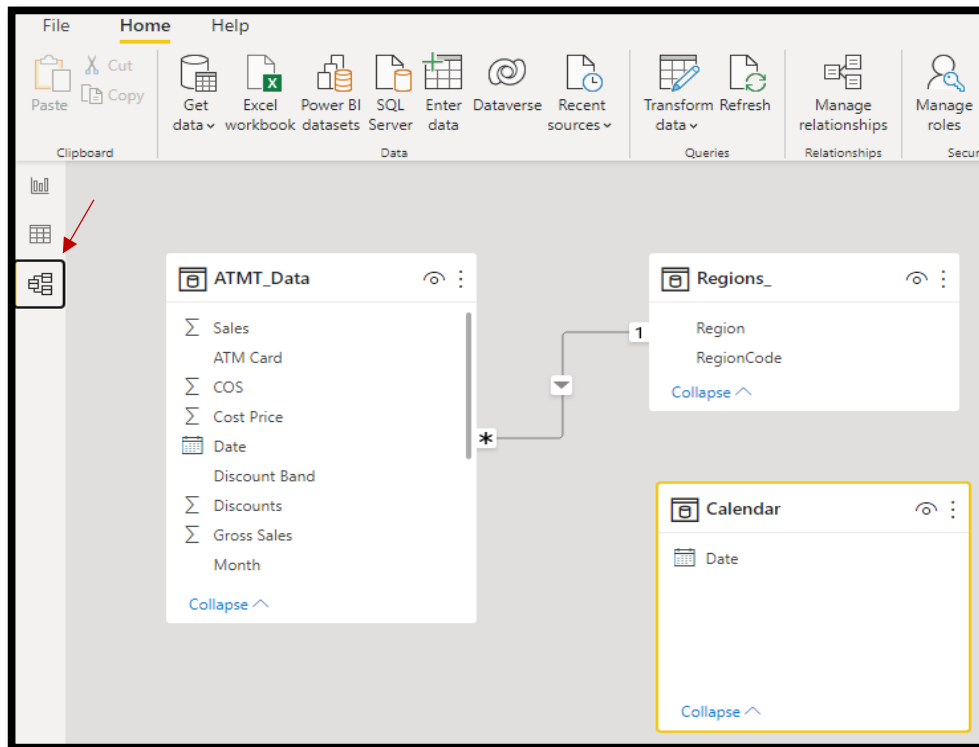
- Type the expression below to generate a **Calendar table** of all dates between January 1, 2021, and December 31, 2021

Calendar = CALENDAR(DATE(2021,01,01),Date(2021,12,31))

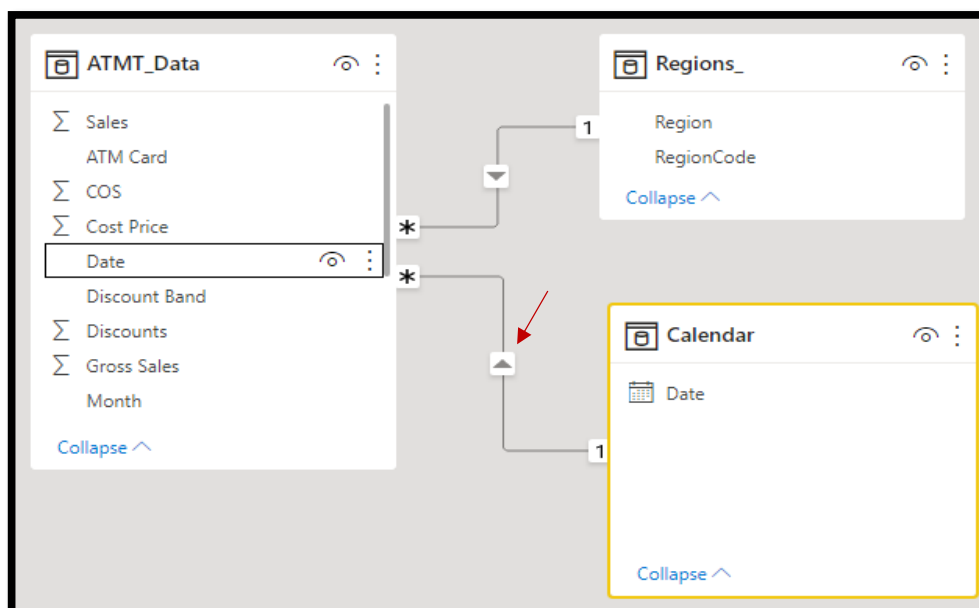
- Select the check mark to commit.



e. Select **Model** view on the left.

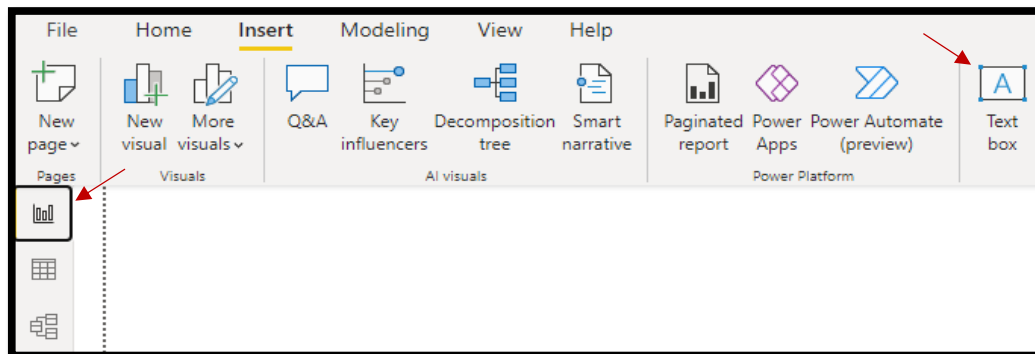


f. Drag the Date field from the **ATM_Transactions** table to the Date field in the **Calendar** table to join the tables, and create a relationship between them.

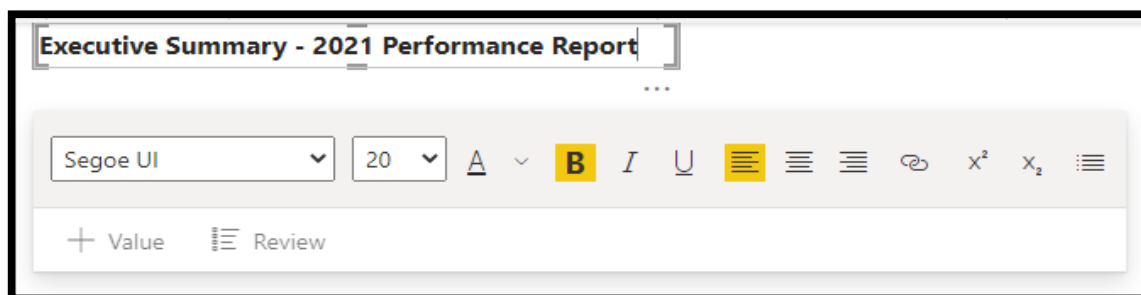


8. Building Report - Visual 1: **Add title**

- Select **Report** view on the left.
- Under the **Insert ribbon**, select Text Box.
Type “Executive Summary – 2021 Performance Report”



- Select the text you typed. Set the font size to 20 and bold.
- Adjust the box to fit on one line.



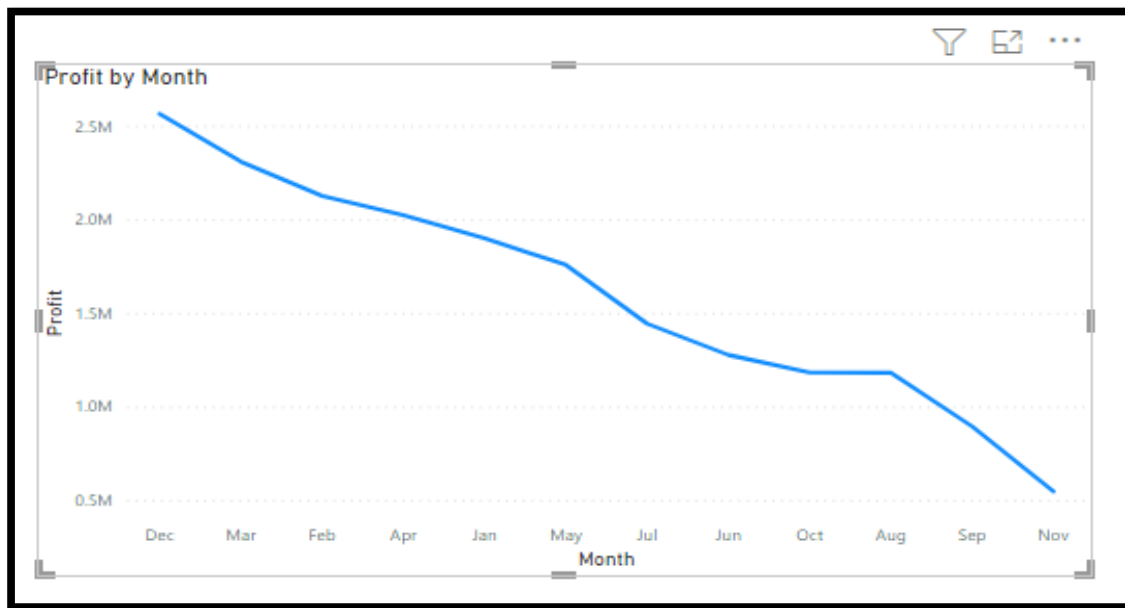
9. Building Report - Visual 2: **Profit by Month**

Create a **Line chart** to see which month had the highest profit.

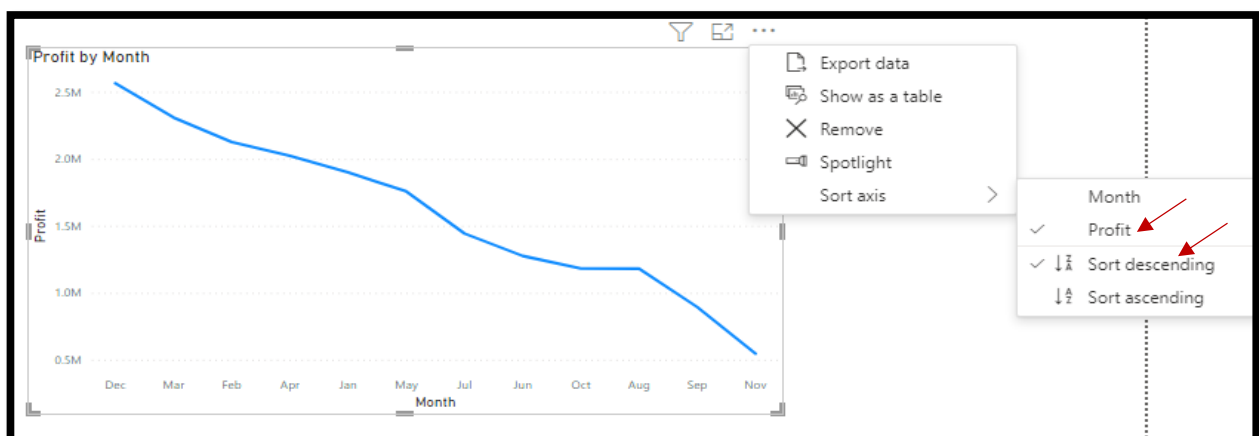
- From the Fields pane in ATM_Transactions table, drag the Profit field to a blank area on the report canvas.
(By default, Power BI displays a column chart with one column, Profit)
- From the Fields pane in ATM_Transactions table, Drag the Month field to the same visual.

(Power BI updates the column chart to show profit by month)

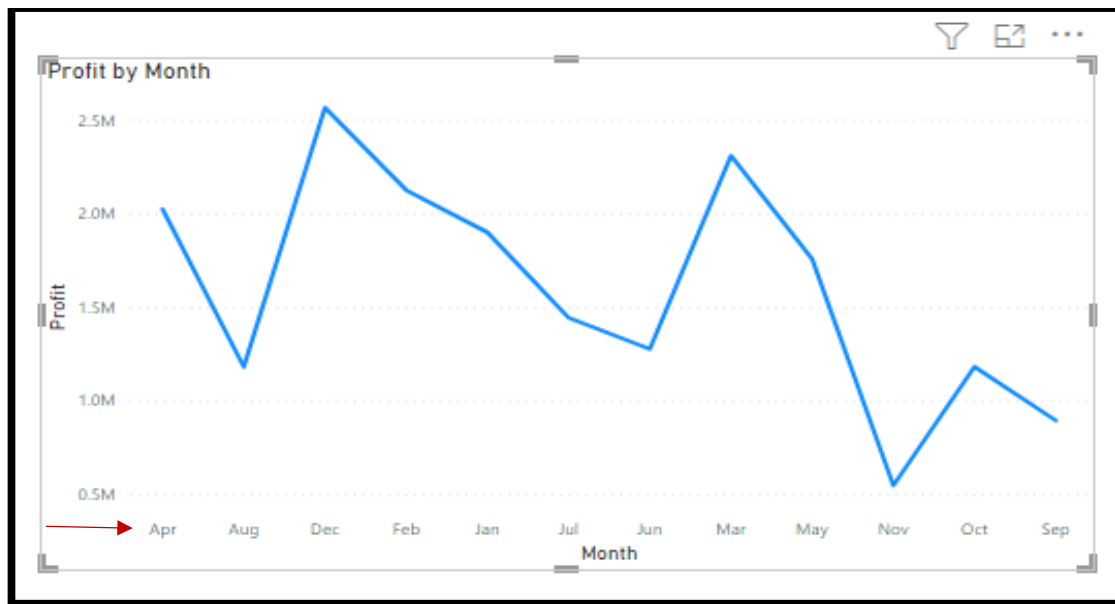
c. In the Visualizations pane, change the visualization type to **Line chart**.



Notice that the Line Chart has been sorted by Profit in Descending order. (Click on the ellipses at the top right corner to check)



We can sort by Month in Ascending order by selecting Month from the list and then choosing Sort Ascending.



Notice that the Months have been sorted in ascending order alphabetically.

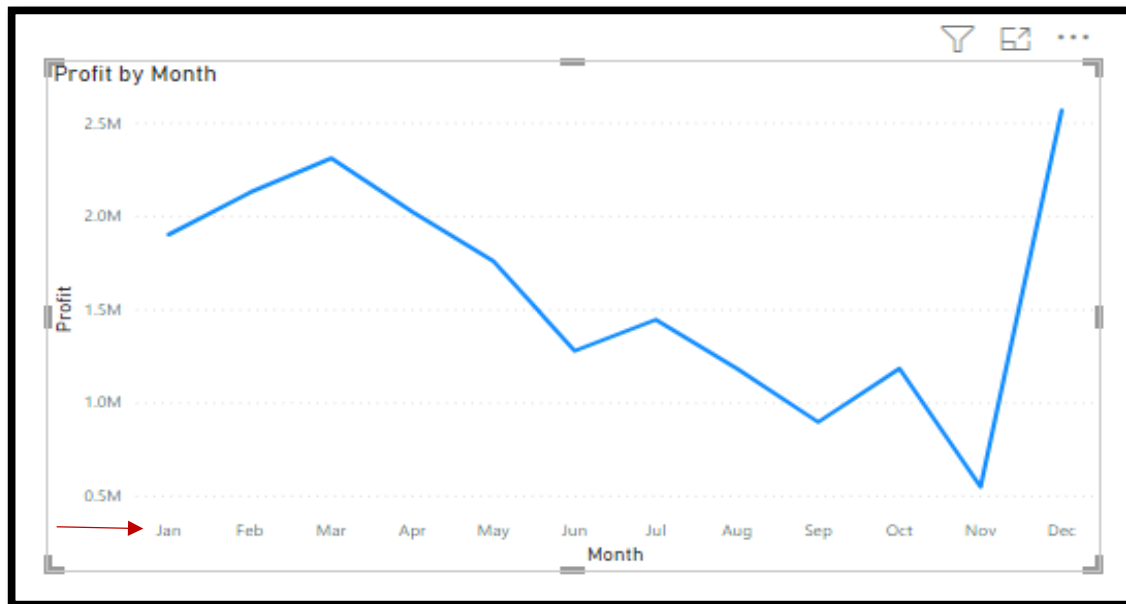
We can sort it in the normal months order by Sorting the Month Column in the **Data View** by the MonthNo Column by:

1. Selecting the Month column.
2. Under **Column tools** tab selecting "Sort by Column".

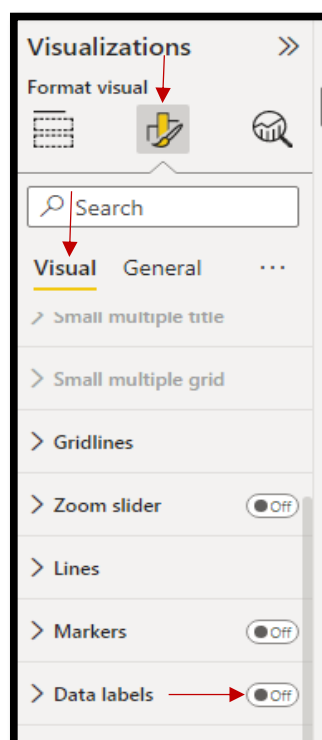
The screenshot shows the 'Column tools' tab in Power BI. The 'Month' column is selected in the data table. The 'Sort by column' dropdown is open, showing 'MonthNo' as the selected option. A red arrow points to the 'Month' column header in the table.

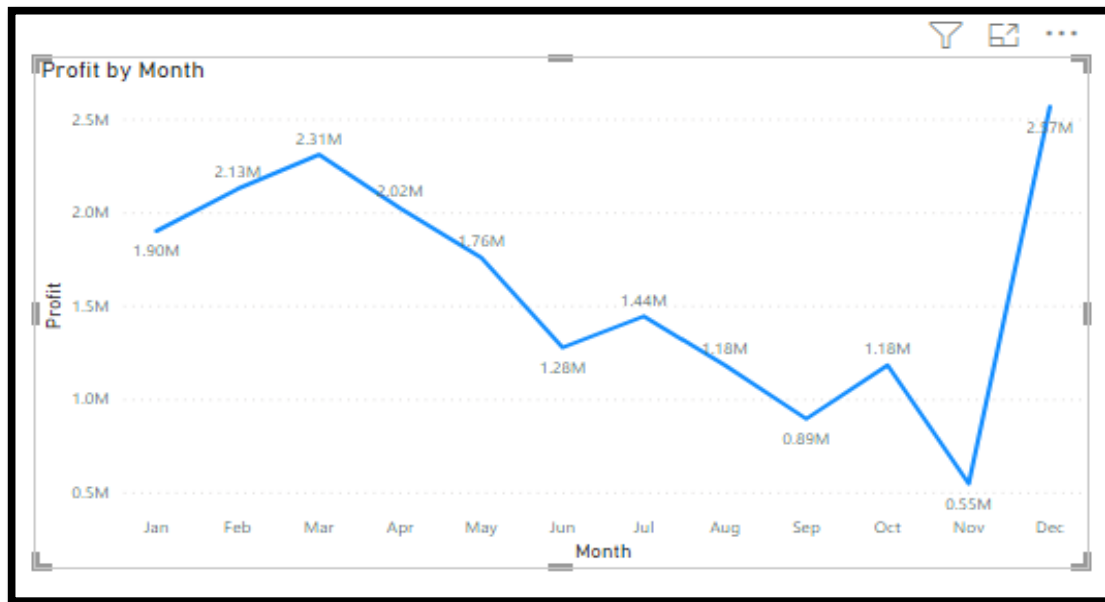
Cost Price	Sale Price	Gross Sales	Discounts	Sales	MonthNo	Month
260	350	529550	0	529550	1	Jan
260	350	352100	0	352100	1	Jan
260	350	603750	0	603750	1	Jan
260	350	529550	0	529550	1	Jan
260	350	352100	0	352100	1	Jan
260	350	534450	0	534450	1	Jan
260	350	962500	0	962500	1	Jan
260	350	423500	4235	419265	1	Jan
260	350	488950	4889.5	484060.5	2	Feb
260	350	754250	7542.5	746707.5	2	Feb
260	350	754250	7542.5	746707.5	2	Feb
260	350	330225	3302.25	326922.75	2	Feb
260	350	488950	4889.5	484060.5	2	Feb

In Report view notice that the Months have now been sorted in the normal months order.



To add **labels** to the chart, under the Formatting tab in the Visualizations pane, Turn on Data Labels (under Visual).

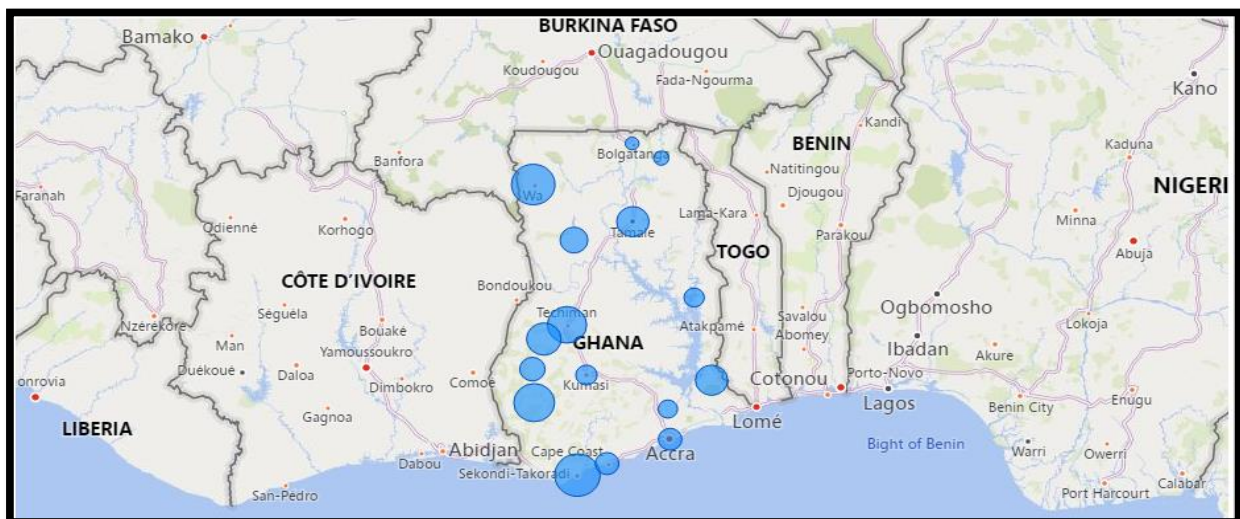




10. Building Report - Visual 3: Profit by Region

Create a **Map** to see which region had the highest profits.

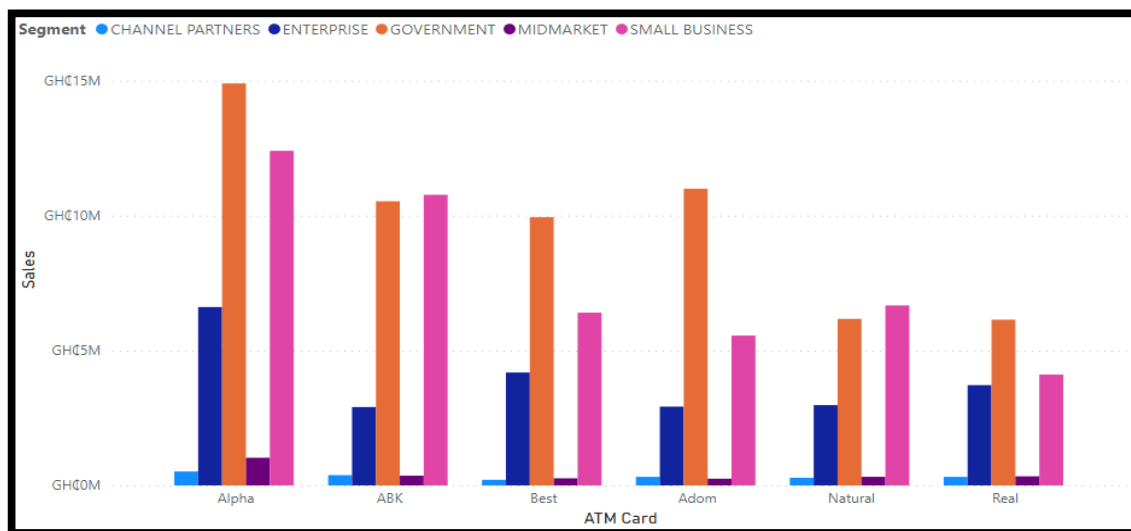
- Select **Map** under Visualizations.
- Check Region field checkbox under ATM_Transactions table.
- Check Profit field checkbox under ATM_Transactions table.
(Power BI creates a map visual with bubbles representing the relative profit of each location)



11. Building Report - Visual 4: Sales by ATM Card and Segment

Create a **Column chart** to determine which products & segments to invest in.

- Select a blank area on the report canvas.
- In the Fields pane, select the Sales, ATM Card, and Segment fields.
- Power BI automatically creates a clustered column chart.
- Drag the chart so it's wide enough to fill the space under the first two charts.



12. Building Report - Visual 5: Months Slicer

- Select a blank area on the report canvas.
- In the **Fields** pane, select the Date field in the **Calendar** table.
- In the **Visualizations** pane, choose **Slicer**.
- In the Fields section of the **Visualizations** pane, select the drop-down in Fields and select Date Hierarchy.
- Remove Year, Quarter and Day so Month are left.

13. Formatting Report

Theme:

Under the **View ribbon**, change the theme to **Executive**.



Do the following changes under the **Format tab** in the **Visualizations** pane:

a. Select the Line Chart Visual.

b. In the Title section under **General** option change Text size to 16 pt. and Toggle Shadow to On (under **Effects**).

c. Select the Map Visual.

d. In the Title section under **General** option, change Title text size to **16 pt.** and Toggle **Shadow** to On (under **Effects**).

e. Select the Clustered Column Chart Visual.

f. In the Title section under **General** option, change Title text size to **16 pt.** and Toggle **Shadow** to On (under **Effects**).

14. Q&A Feature

Use natural language to type questions.

To exit Click on Exit Q&A

15. Publishing Reports in the **Power BI Service**

Power BI reports can't easily be sent out because:

a. The file is large.

b. The recipient may not have Power BI. Even if they have Power BI they may not know how to navigate around it.

The best option is to **Publish** it to a location online and share the links or the Dashboard with others using the following steps:

16. Steps to Publish Reports in the **Power BI Service**

- a. Save the file
- b. In the **Home tab ribbon**, select Publish
(to publish the report online in the Power BI Service)
- c. You maybe prompted to sign-in
(choose My Workspace or Group Workspace)
- d. Open Data Model in Power BI Online
- e. Take note of the waffle and Hamburger at the top left corner
- f. Take note of the Edit Report tab
(turns to Reading View when in editing mode)
- g. You can pin some of the visuals to a Dashboard (new / existing)
(Note that Slicers cannot be pinned)

17. Sharing a Dashboard

- a. Select Dashboard on the left (under Dashboards)
- b. Click on **Share** at the top right corner
- c. Enter email address of people you want to share with
- d. Click on Share

You have the option to later "Stop Sharing" or Disable Reshare"
(Share > Access > ...)

You can also copy the Dashboard Link and share with people who have Power BI (at least Power BI Desktop)

18. Sharing a Report with Receipient without Power BI installed

Where the receipient doesn't have Power BI or Office Online then

you can share the Report by:

a. Clicking on Report to share

b. File tab

c. Publish to web / Embed in SharePoint Online / Export to PowerPoint /
Download Report

