Power BI

Dashboard in a Day Lab 2

Contents

Introduction

This is lab two out of five labs in total. **Please continue to use your file after completing Lab 1.** If you are joining the DIAD at this point or were unable to complete Lab 1, please start this lab with the "Lab 1 solution.pbix" file you can find in the **Reports** folder.

In this lab you will learn how to:
- create a range of different charts.
- highlight and cross-filter.
- create new groups and hierarchies.
- add new measures to the model to do additional analysis.

The lab includes steps for the user to follow along with associated screenshots that provide a visual aid. In the screenshots, sections are highlighted with red or orange boxes to indicate the area the user needs to focus on.

> **Note:** *This lab uses real, anonymized data provided by ObviEnce, LLC. Visit their site to learn about their services. This data is the property of ObviEnce, LLC and has been shared to demonstrate Power BI functionality with industry sample data. Any use of this data must include this attribution to ObviEnce, LLC.*

Power BI Desktop – Data Modeling and Exploration

In this section, we will learn about the key parts of the Power BI desktop. We will model and explore the data and build visuals.

Power BI Desktop - Layout

Let's start with the main **Power BI Desktop** window of your file entitled **MyFirstPowerBIModel** *(This is the file that we saved at the end of Lab 1; refer back to the Introduction)* and become familiar with the distinct sections available.

1. At the top of the window within the ribbon, you will see the **Home** tab where the most common operations you perform are available.

2. The **Insert** tab in the ribbon allows you to insert shapes, a text box or new visuals.

3. The **Modeling** tab in the ribbon enables additional data modeling capabilities like adding custom columns and calculating measures.

4. The **View** tab has options to format the page layout.

5. The **Help** tab provides self-help options like guided learning, training videos and links to online communities, partner showcases and consulting services.

6. On the left side of the window, you have three icons within the **Navigation** menu: **Report, Data** and **Model**. If you hover over the icons, you can see the **tooltips**. Switching between these allow you to see the data and the relationships between the tables.

7. The center **white space** is the canvas where you will be creating visuals.
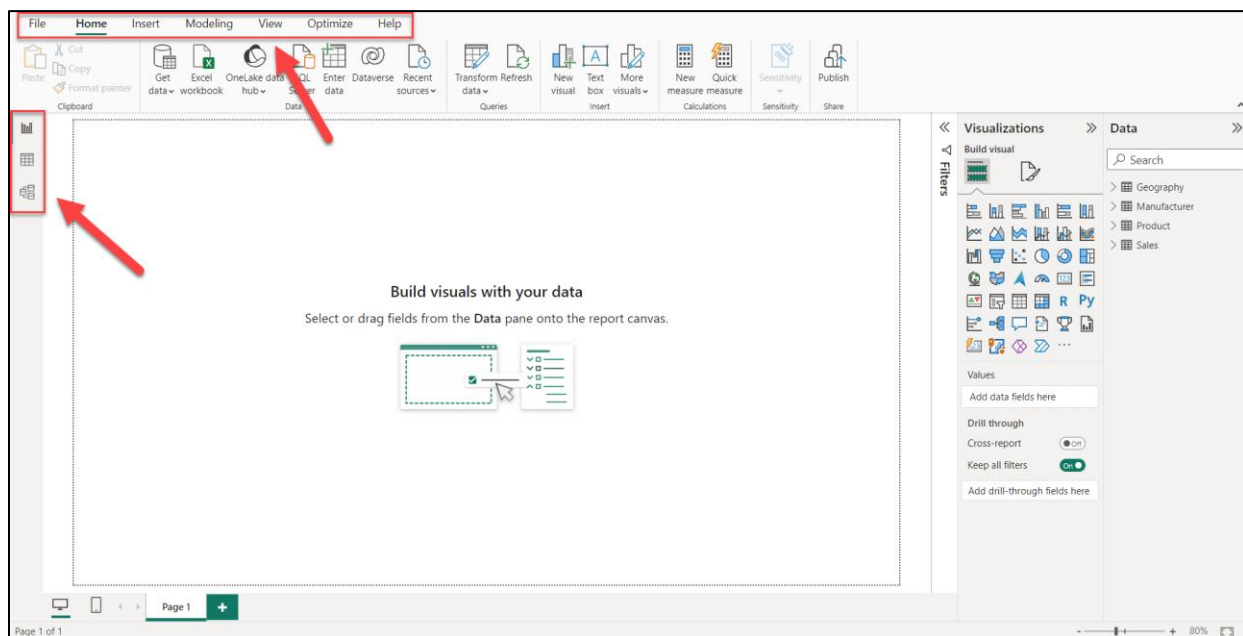
8. The **Visualizations** pane on the right-side of the window allows you to select visualizations, add values to the visuals, and add columns to the axis or filters.

9. The **Data** pane is where you see the list of tables which were generated from the queries. By selecting the arrow next to a table name, you can expand the list of fields for that table.
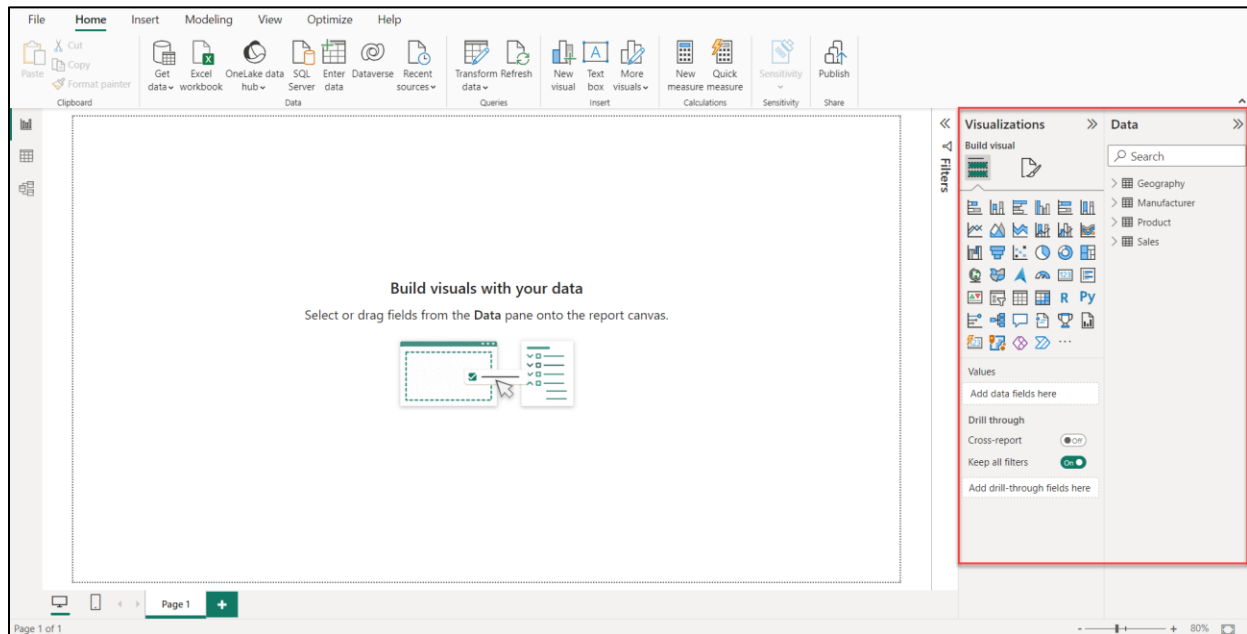
10. Select the **Data** view icon within the **Navigation** menu to the left side of the screen. Select and expand the **Sales** table within the **Data** pane as shown in the figure below. Scroll up and down to notice how fast you can navigate through over three million rows.
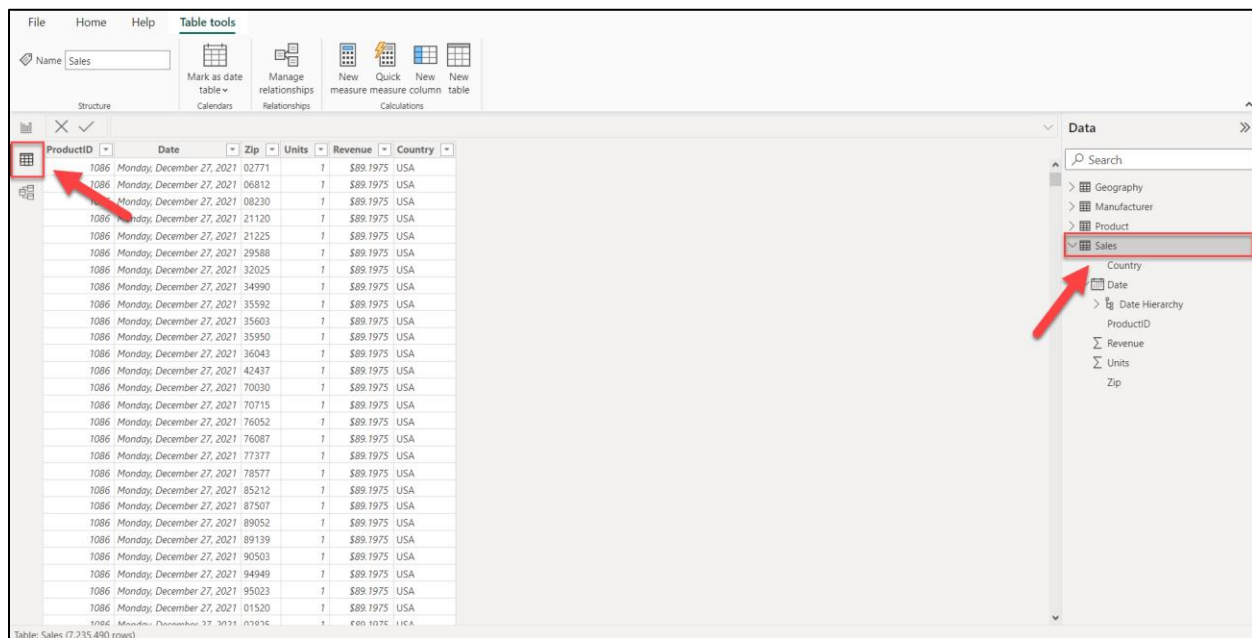
11. Select the **Model** view icon within the **Navigation** menu to the left side of the screen. You will see the tables you have imported along with Relationships. The Power BI Desktop can often automatically infer relationships between the tables.

- A relationship is created between the **Sales** and **Product** tables using the **ProductID** column.
- A relationship is created between the **Product** and **Manufacturer** tables using the **ManufacturerID** column.

Power BI supports multiple types of relationships:

- 1 to many
- 1 to 1
- Many to many
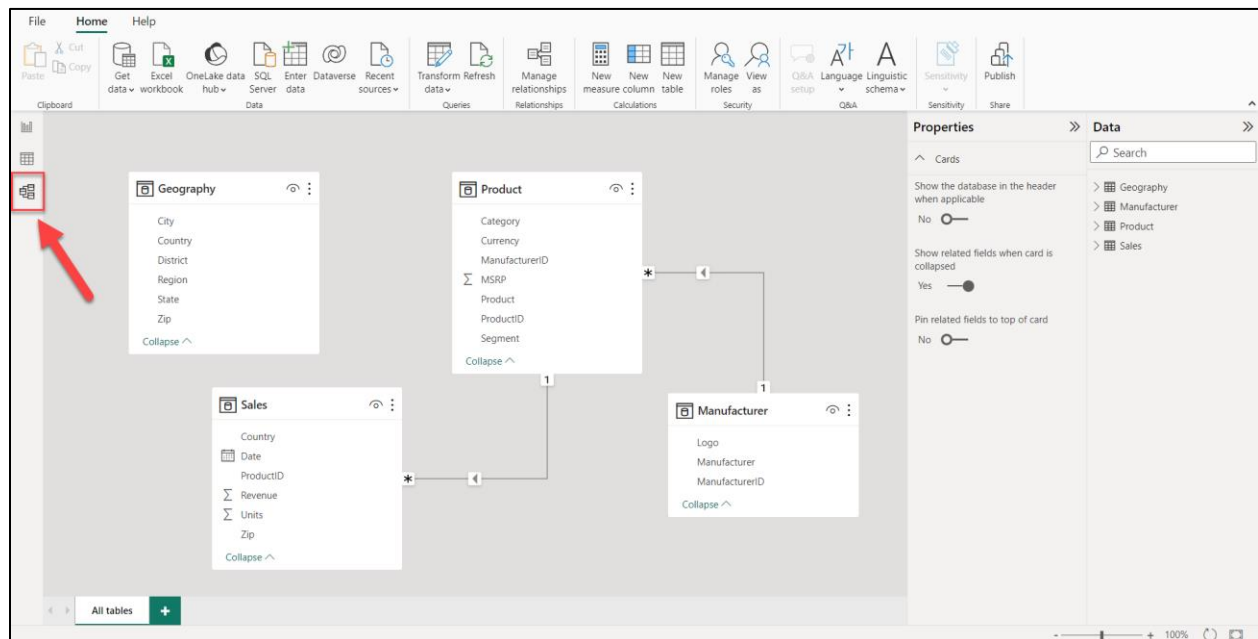
In this lab, we will be using the 1 to many type of relationship, the most common type of relationship. This means one of the tables involved in the relationship should have a unique set of values. We will create additional relationships later in this lab.

Drag, **resize,** and **move** the tables to appear similar to those shown in the figure below:

Note: Tables may not appear as shown in the figure. You can zoom in and out of the **Relationship** models by dragging the zoom slider in the bottom right corner of the window. Also, if you want to ensure you are seeing all the tables, use the **Fit to Screen** 🔲 icon. You can resize the tables by selecting the boarders of the tables and dragging.
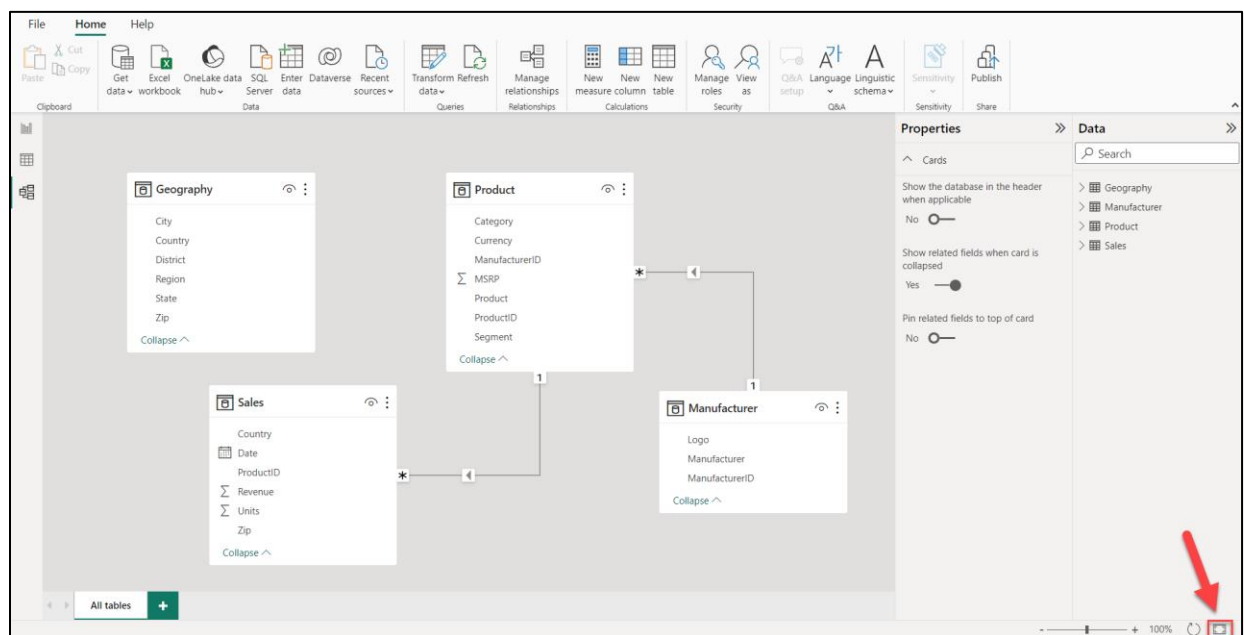
Power BI Desktop – Data Exploration

Now that we have loaded data, let's start with analyzing sales by country.
Ensure that you are currently viewing the report you created and titled MyFirstPowerBIModel in the previous lab.

1. Select the **Report** view icon from the **Navigation** menu to the left side of the Power BI Desktop.
2. Select the **Clustered column chart** visual from the **Visualizations** pane.
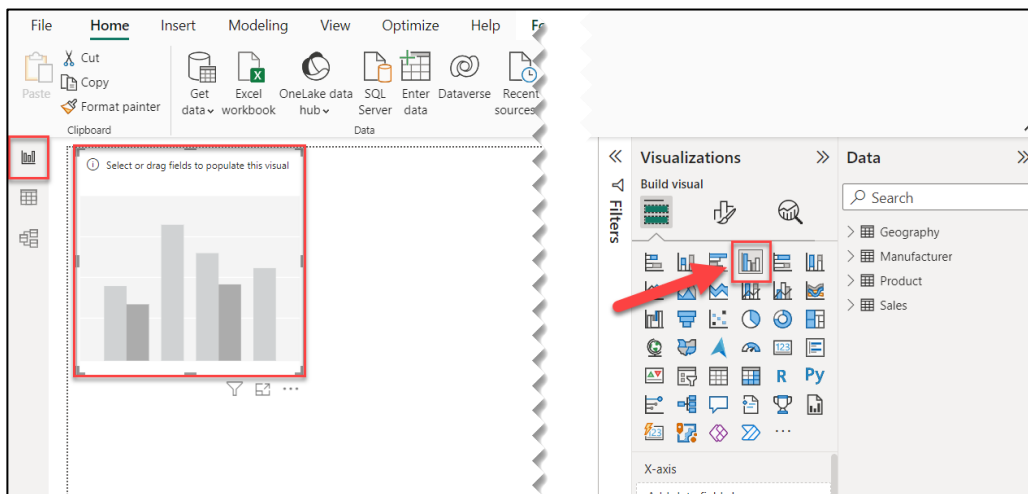
3. From the **Data** pane to the right of the screen, expand the **Geography** table and then select the **checkbox** next to the **Country** field. Notice that the **Country** field is placed within the **X-axis** box within the **Visualizations** pane.
4. From the **Data** pane again, expand the **Sales** table and then select the **checkbox** next to the **Revenue** field. Notice that the **Revenue** field is placed within the **Y-axis** box within the **Visualizations** pane.
5. **Resize** the visual as needed by dragging the anchor points around the edges of the visual as shown below.
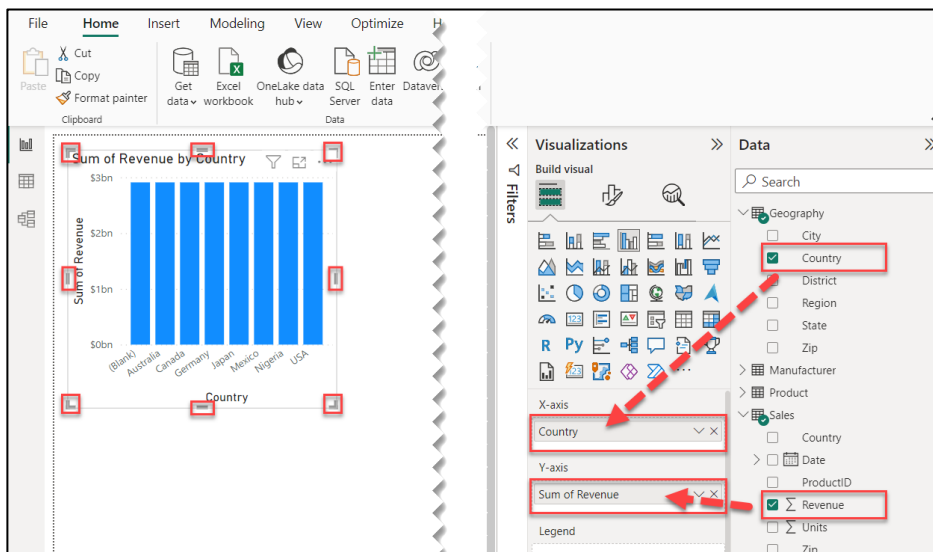
Notice that the **Sum of Revenue** of each country is the same. This is because there is currently no relationship between the tables used in the visual.

Next, we will create a relationship between the Sales and Geography tables.

6. Select the **Model** icon within the **Navigation** menu to the left side of the Power BI Desktop to navigate to the **Model** view.
7. Our sales data is by Zip code, so we need to connect the **Zip** column from the **Sales** table with **Zip** column in the **Geography** table. To do this, select, drag, and drop the **Zip** field in the **Sales** table to on top of the **Zip** field in the **Geography** table.
   You will notice the **Create relationship** dialog opens with a warning message at the bottom stating the relationship has a many-many cardinality. The reason for the warning is that we don't have unique Zip values in the **Geography** table. This is because multiple countries could have the same Zip code. Let's concatenate the **Zip** and **Country** columns to create a unique value field.
8. Select the **Cancel** button at the bottom of the **Create relationship** dialog box.
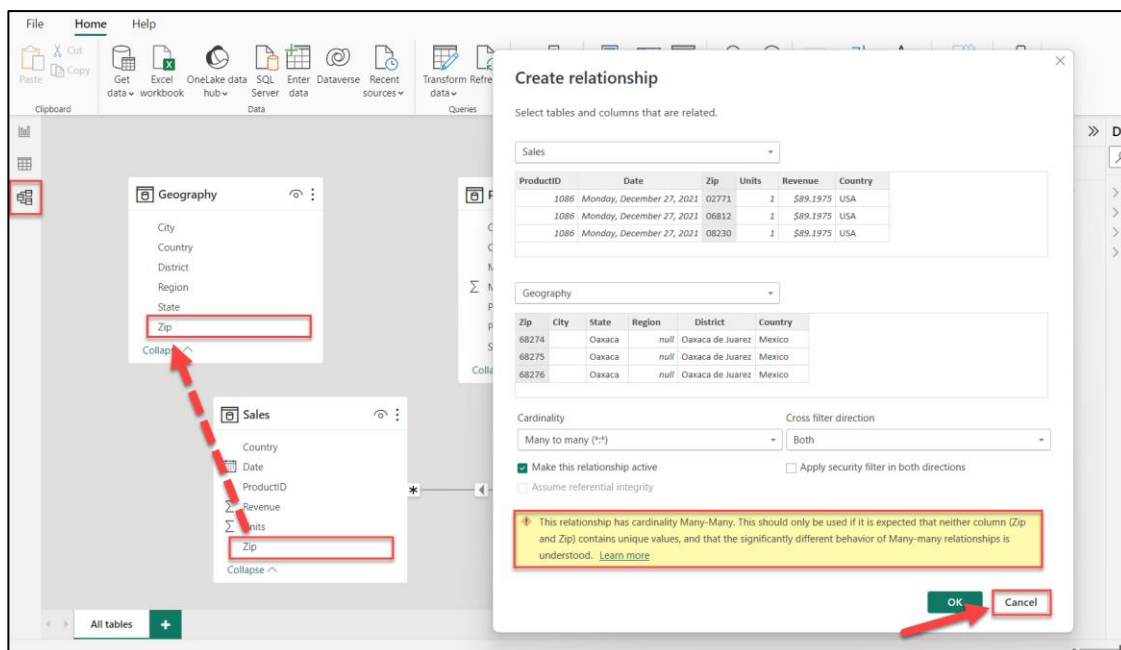
We need to create a new column in both the **Geography** table and the **Sales** table that combines the **Zip** and **Country** columns. Let's start by creating a new column in the **Sales** table.

9. Select the **Report** icon from the **Navigation** menu to the left of the screen to navigate to the **Report** view.

10. Within the **Data** pane, hover over the **Sales** table name, then select the **ellipses (…)** to the right of the table name. Choose **New Column** from the options menu. You will then see a formula bar appear, as shown in the figure below, to help create this new column.
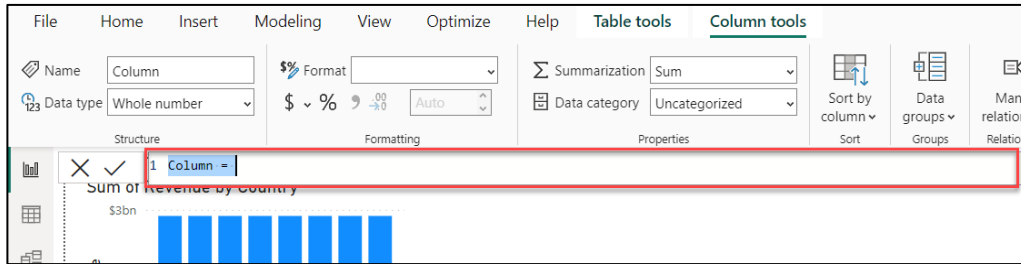
11. Now we are ready to combine the **Zip** and **Country** columns into a new column called **ZipCountry**, separated by a comma. To create this column called **ZipCountry**, type the following calculation in the formula bar:

ZipCountry = Sales[Zip] & "," & Sales[Country]
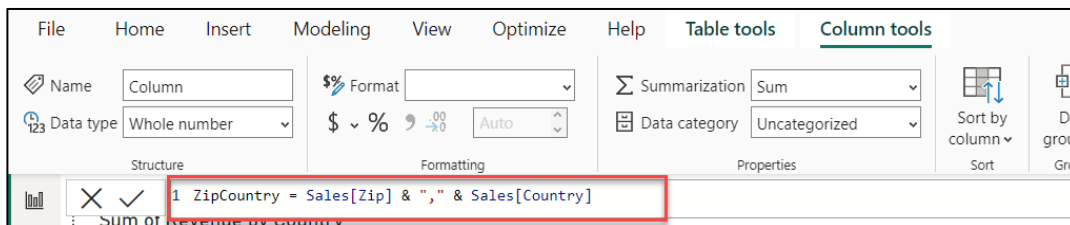
12. Once you are done entering the formula in the formula bar, press **Enter** on your keyboard or select the **checkmark** on the left side of the formula bar.

You will notice that IntelliSense appears guiding you to choose the correct column. The language you used to create this new column is called **Data Analysis Expression (DAX)**. We are connecting columns (Zip and Country) in each row by using the "&" symbol. The icon with an (fx), near the new column ZipCountry, indicates that you have a column containing an expression, also referred to as a calculated column.

IMPORTANT!

If you get an error creating a new column, make sure your Zip column is the Text Data Type.

Note: *An alternative way to add a new column is by selecting the table from the* **Data** *pane, selecting the* **Table Tools** *or* **Modeling** *tab, and then choosing* **New Column** *from the menu.*
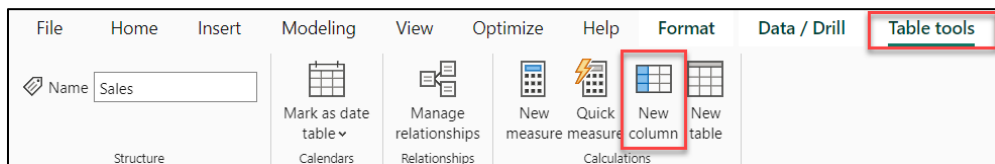
Let's use this method to create a **ZipCountry** column in the **Geography** table.

13. From the **Data** pane, select the **Geography** table. Then from the ribbon, choose **Modeling**, and then select **New Column** as shown in the figure below:

14. A formula bar now appears. Enter the following DAX expression in the formula bar:

ZipCountry = Geography[Zip] & "," & Geography[Country]
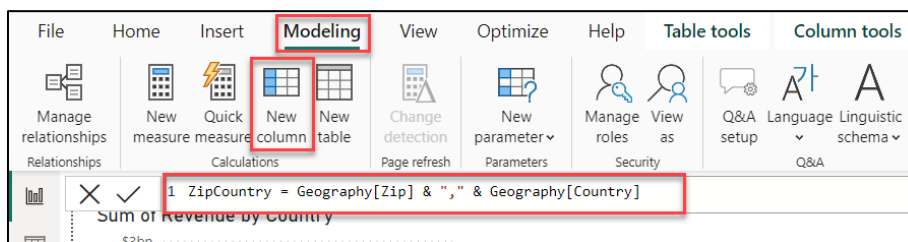
You will see a new column, **ZipCountry**, in the **Geography** table. The final step is to set up the relationship between the two tables using the newly created **ZipCountry** columns in each of these tables.

15. Select the **Model** icon in the Navigation menu to the left of the Power BI Desktop to navigate back to the **Model** view.
16. Drag and drop the **ZipCountry** field from the **Sales** table to on top of the **ZipCountry** field in the **Geography** table.

Note: If you do not see the **ZipCountry** column you may need to scroll down on the list of columns in each table.
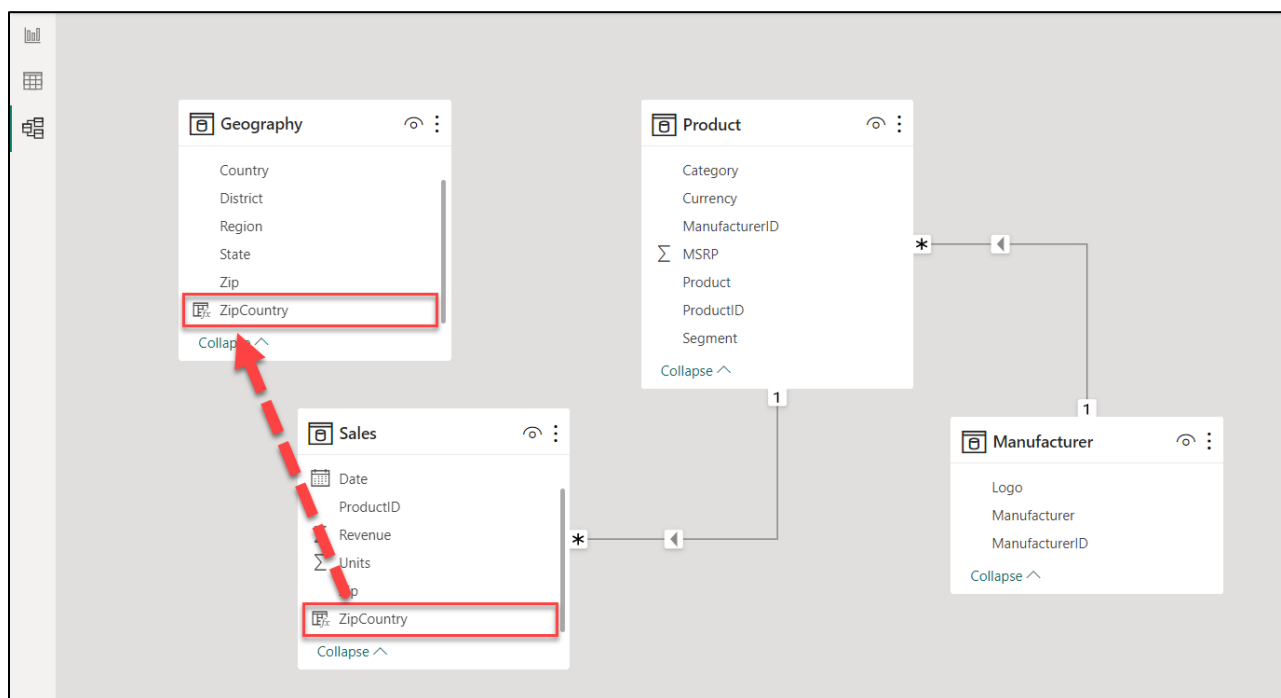
Now we have successfully created a relationship. The number "1" next to **Geography** indicates it is on the one side of the relationship and the "*" next to **Sales** indicates it is on the many side of the relationship.

17. Select the **Report** icon within the **Navigation** menu to the left of the Power BI Desktop to navigate back to the **Report** view.

Notice the clustered column chart that we created earlier. It shows different sales for each country or region. USA has the most sales, followed by Australia and Japan.

> **Note**: If your clustered column chart is missing countries then you may need to double check that you completed step 99 on lab 1 correctly.

By default, the chart is sorted by **Revenue**. In this next section we will begin to use the data model we have designed by exploring several data visualization components.

18. Select the **Clustered Column Chart** visual. Select the **ellipses (…)** located near the top right corner of the visual (alternatively, the ellipse may be at the bottom of the chart). Notice there is an option to **Sort axis** by **Country**. Do not make any changes for now. Select the background of the report to close out the options menu.
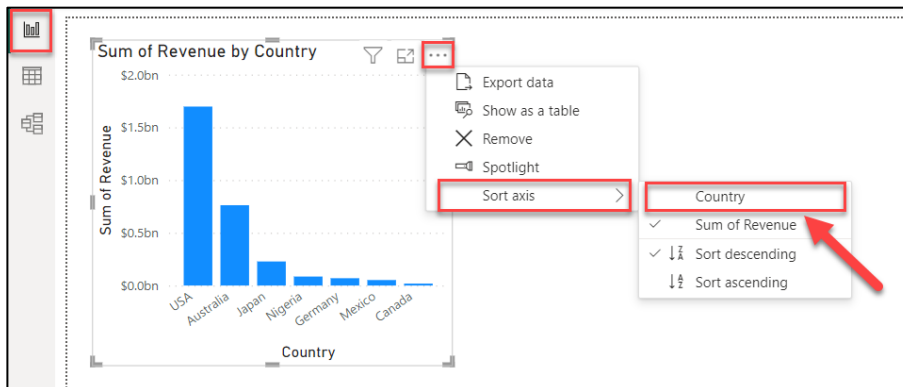
19. Select the **Clustered column Chart** again. Then, from the **Data** pane, expand the **Manufacturer** table, and then drag and drop the **Manufacturer** column to the **Legend** section of the **Visualizations** pane.
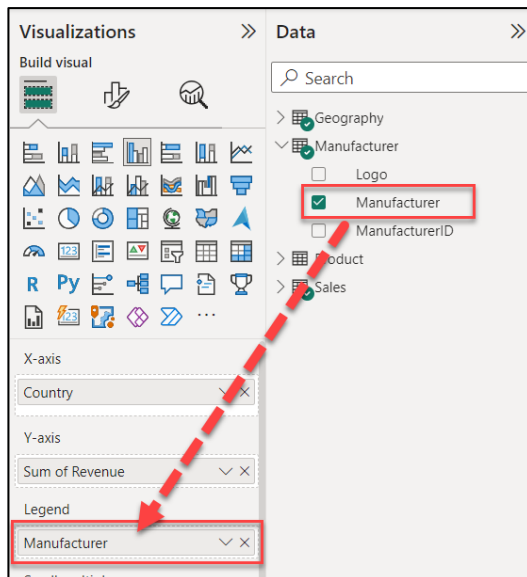
20. **Resize** the visual as needed within the canvas.

Now we can see the top manufacturers by country.
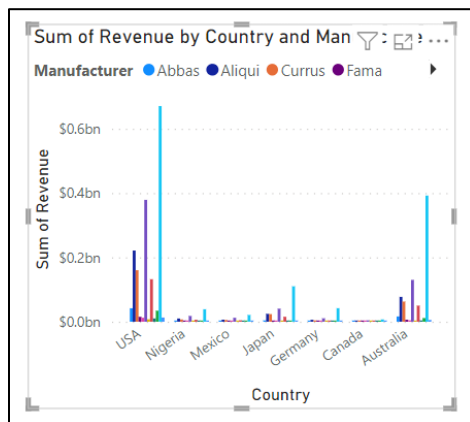
Now let's try different visuals to see which chart represents the data the best.

21. With the **Clustered column Chart** visual selected in the design space, select and change the chart to a **Stacked column chart** by choosing the visual type within the **Visualizations** pane.

22. Sort the **legend** in **descending** order using the same method you learned previously (*selecting the ellipsis in the corner of the visual*).
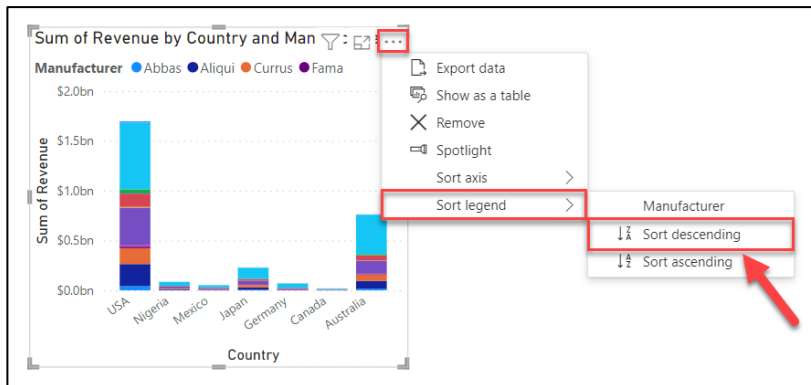
23. If the **Filters** pane is not yet expanded, select the **<<** at the top of the collapsed pane to expand it. Within the **Filters** pane, expand **Manufacturer** under the **Filters on this visual** section. A drop-down arrow will appear for you to expand when you hover your mouse over Manufacturer.

24. Using the **Filter type** dropdown menu, select **Top N**.

25. Enter **5** in the text box next to **Top**.

26. From the **Sales** table, drag and drop the **Revenue** field into the **By value** section.

27. Select **Apply filter** at the bottom of the **Manufacturer** section within the **Filters** pane to activate the filter.
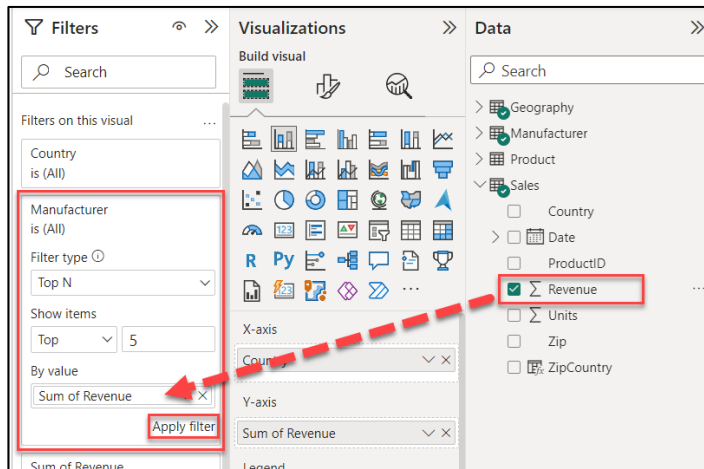
Notice that the visual is filtered to display the top five manufacturers by **Sum of Revenue**. We see that the manufacturer VanArsdel has a higher percentage of sales in Australia compared to other countries or regions.

If you desire, you can now collapse the Filters pane until it is needed.

We can now add total labels to the stacked visuals. Let's explore font formatting options.

28. Select the **Format your visual** (*the paintbursh icon*) tab at the top of the **Visualizations** pane, and then expand the **X -axis** section.

29. Select the **Bold** and **Italic** options – feel free to try different formatting options in different areas. For the purpose of this lab, we will turn on Bold and Italic.
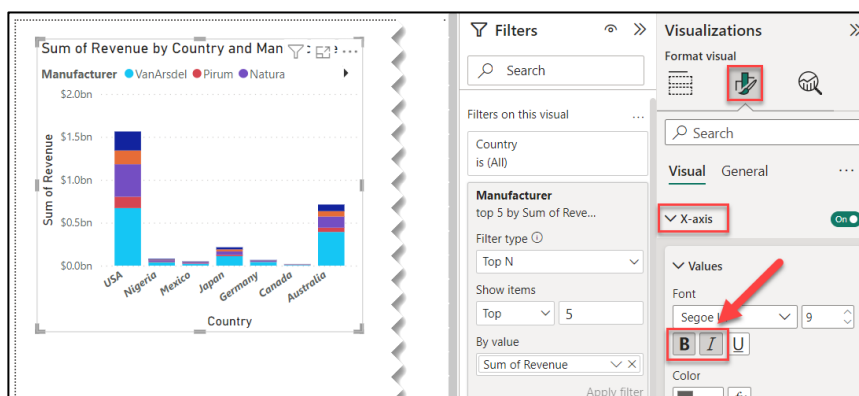
30. Navigate to the **Total labels** section within the **Visualizations** pane and switch the setting to **On**.
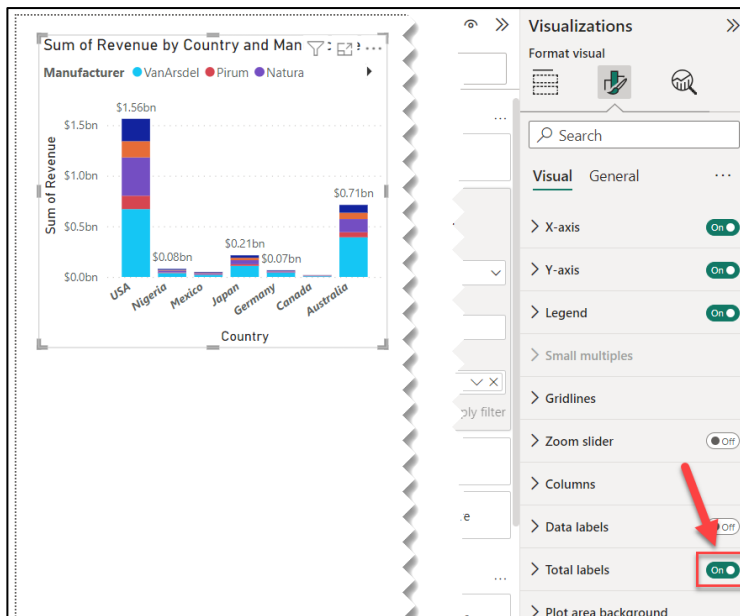
Notice the total labels now appearing above each of the columns within the Stacked column chart. Any of these properties can very easily be changed or turned on/off whenever you like.

Now let's **remove** the total labels.

31. Select the **On/Off** toggle setting next to **Total labels** to switch the setting to **Off** again.
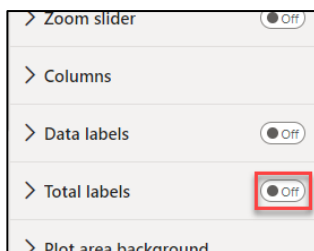
We are interested in the **top five** competitors by revenue. Let's group them so we don't have to add a filter to every visual. Before we do that, we'll remove the **Top 5** visual level filter we added earlier.

32. Begin with the **Stacked column chart** selected in the canvas.
33. Hover over and select the **Clear filter** icon (eraser) next to the **Manufacturer** field in the **Filters** pane.
    (You may need to expand the Filters pane if you previously collapsed it)
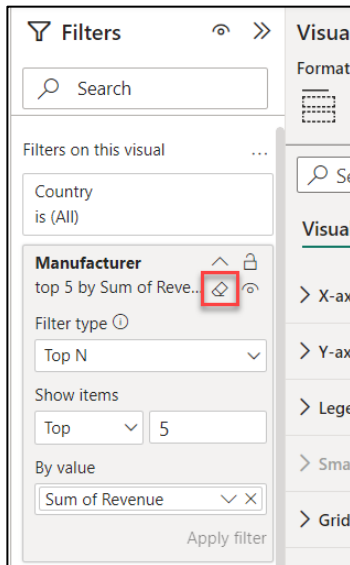
Note: You will only see the eraser icon when you hover your mouse over the Manufacturer filter section.

34. From the **Data** pane, expand the **Manufacturer** table and right-click on the **Manufacturer** field.

> **Note:** *Do not select the checkbox.*

35. Select **New Group** from the options menu.
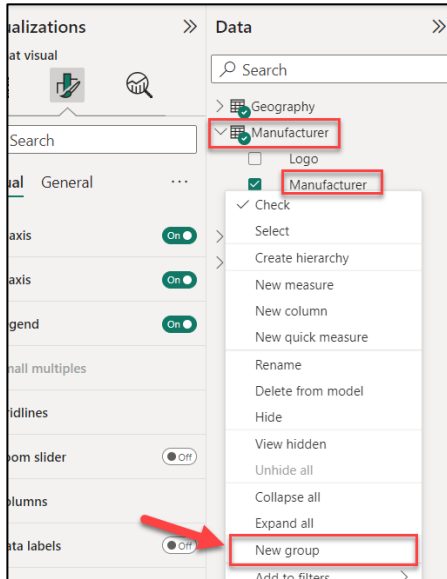
36. In the **Ungrouped values** section of the **Groups** dialog, using the **CTRL** key (to multi-select), choose **Aliqui, Currus, Natura**, and **Pirum**.

37. Select the **Group** button. Notice a new group is added in the **Groups and members** section.

38. Double-click the newly created group and rename it **Top Competitors**.

39. Select **VanArsdel** from the **Ungrouped values** section and select the **Group** button to create the **VanArsdel** group.

40. Select the checkbox **Include Other group**. This will create another **Other** group that includes all the other manufacturers.

41. Select **OK** to close the **Groups** dialog.
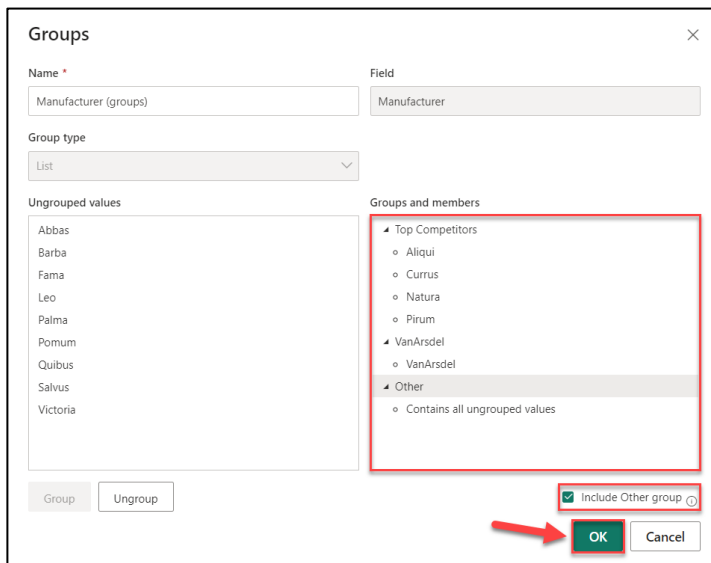
42. Navigate back to the **Build visual** tab of the **Visualizations** pane. With the **Stacked column chart** selected in the canvas, select the **X** next to **Manufacturer** in the **Legend** section of the **Visualizations** pane. This will **remove** the Manufacturer field from the Legend.
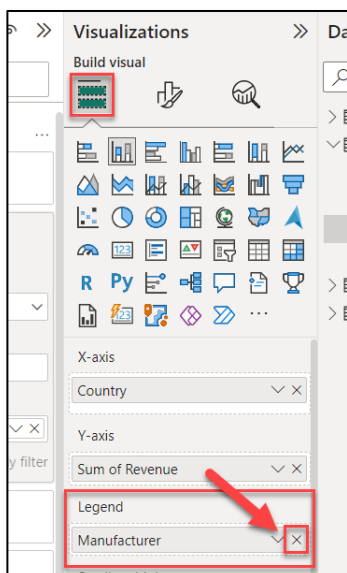
43. From the **Data** pane, drag and drop the newly created **Manufacturer (groups)** to the **Legend** section of the **Visualizations** pane. Now we can see that VanArsdel has nearly 50% share in Australia.
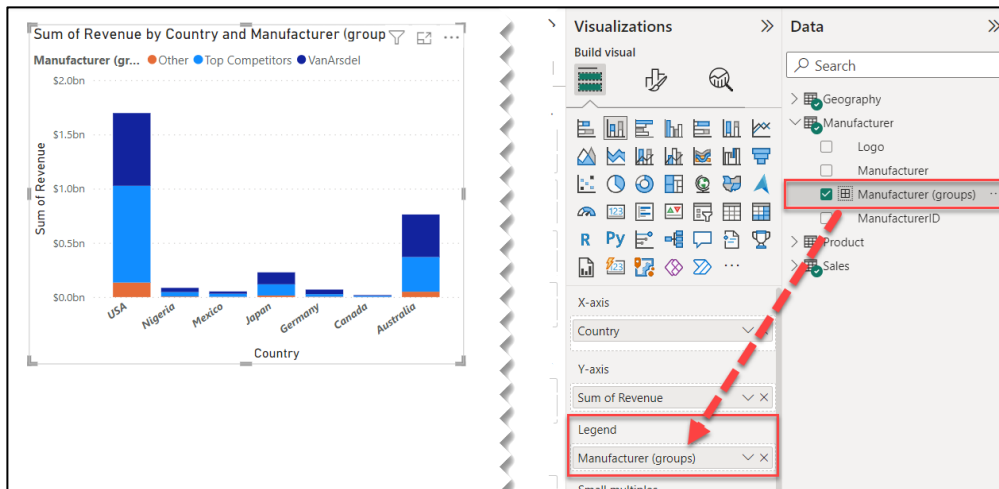
Note: It is ok if you notice that the colors used in your column chart are in a different order than what appears here. This can be adjusted by changed the Legend sort order as you saw in step 34.

44. Hover over one of the columns in the **Stacked Column Chart** and right-click.
45. Select **Show as a table** from the context menu. You will now be in **Focus** mode with the chart displayed on top and the data displayed below. Notice that VanArsdel has a large percent of the Australian market.
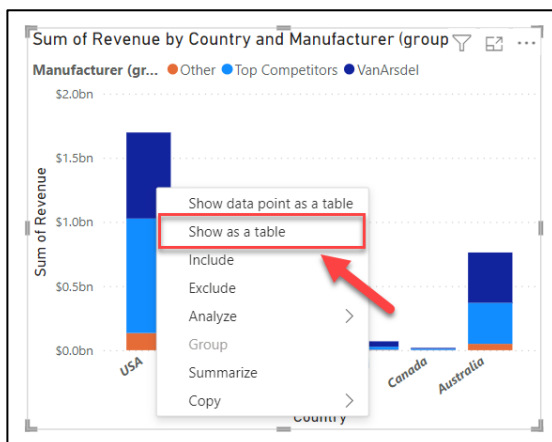
46. Use the **orientation icon** in the top right corner of the chart to switch to the **vertical layout**. In this layout, you view the chart on the left and the data on the right in two separate panels.
47. Switch back to the horizontal layout and select **Back to Report** to navigate back to the **Report** canvas.
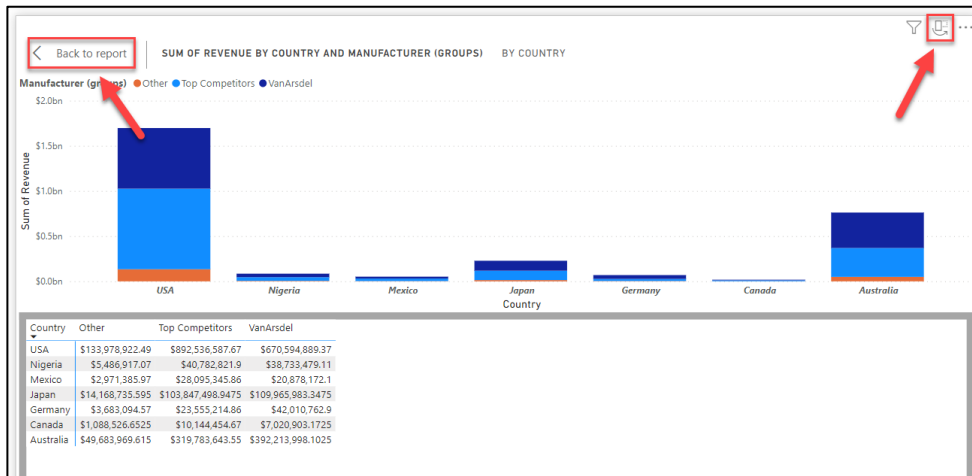
> **Note**: *You can similarly right-click on a column in the chart and select **Show data point as a table** to see records for a specific data point.*

Now let's create a **Revenue by Manufacturer** visual.

48. Select the white space in the canvas to **deselect** the **Stacked column chart** visual. From the **Data** pane, select the checkbox next to the **Revenue** field in the **Sales** table.
49. From the **Data** pane, select the checkbox next to the **Manufacturer** field in the **Manufacturer** table.
50. From the **Visualizations** pane, select the **Treemap** visual.
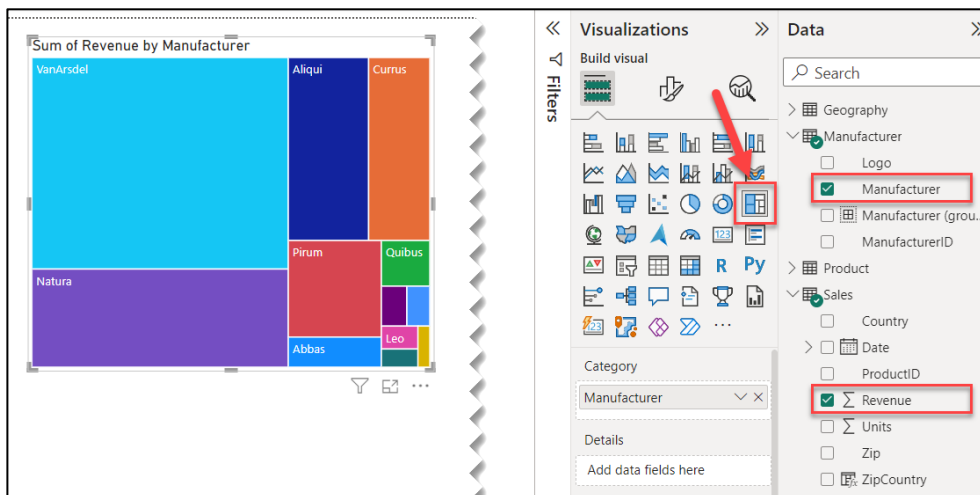
We now have **Sum of Revenue by Manufacturer**.
Let's turn our attention to the interaction between the **Stacked Column Chart** and the **Treemap** visuals.

51. Within the **Treemap** visual, select **VanArsdel** and notice that the **Stacked column chart** is highlighting only the values related to **VanArsdel**. This confirms that VanArsdel has a large percentage of the Australian market.
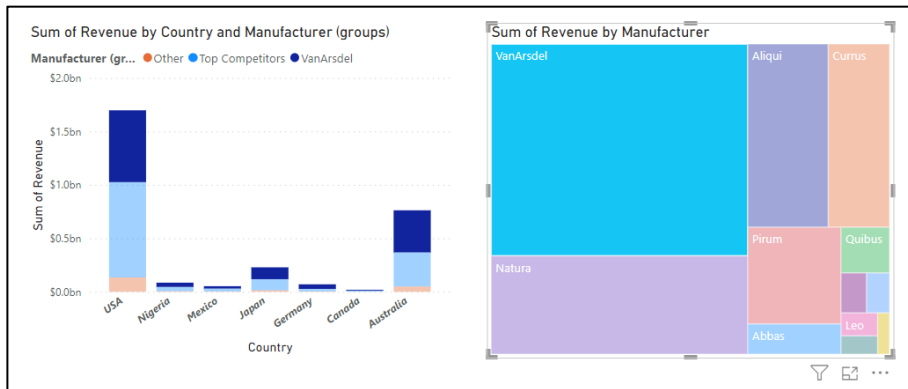
52. To **remove** the highlighting, select **VanArsdel** again.
This interaction between visuals is called **cross-highlighting**.

Previously, we added a **Top 5 Visual level** filter. Now let's add a filter to the **Page level**, so we are working with the Top Competitors and VanArsdel, and so we can filter out the other manufacturers.
Page-level filters apply to all visuals on the page. Visual-level filters apply only to the visual. Ensure the **Filters** pane is expanded/open.

53. Ensure that the **Treemap** visual is still selected. From the **Data** pane, drag and drop **Manufacturer (groups)** from the **Manufacturer** table to the **Filters on this page** box in the **Filters** pane**.**
54. Select both **Top Competitors** and **VanArsdel**.
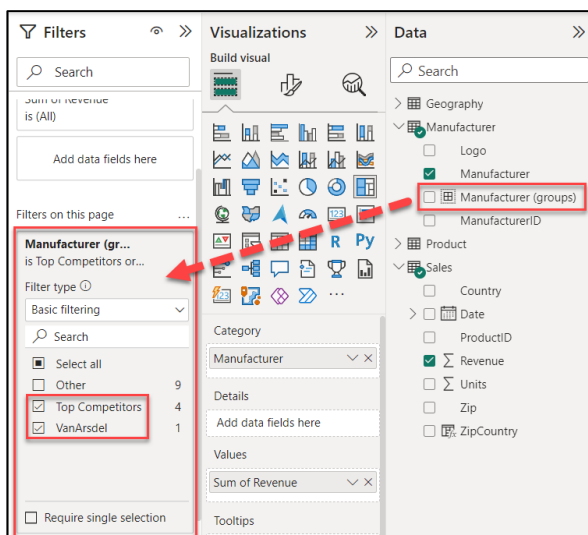
Now, let's add a visual that provides sales information over time.

55. Begin by selecting the **white space** in the **canvas** to ensure that nothing is selected.
56. Select the checkbox next to the **Date** field in the **Sales** table. Notice that a **Date Hierarchy** is created if you have **Auto date/time** turned on.

> *Note: If you do not see the data hierarchy go to **File -> Options and settings -> Options -> Current file -> Data load -> Auto date/time)** to turn it on.*

57. Select the checkbox next to the **Revenue** field in the **Sales** table.
58. Change the newly created visual to a **Clustered column chart**. Notice in the **X-axis** section, a date hierarchy is used. There are arrows on the visual header which are used to navigate through the hierarchy.
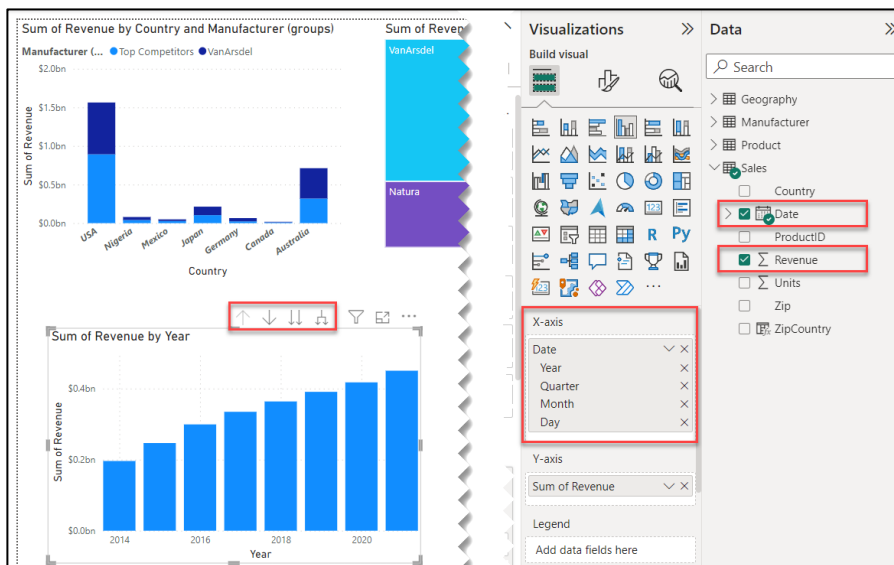
We have already noticed that VanArsdel has a large share of the market in Australia. Let's see how VanArsdel has done over time in Australia.

59. Select the **Sum of Revenue by Country and Manufacturer (groups)** chart and remove **Manufacturer (groups)** from the **legend** within the **Visualizations** pane by selecting the **X**.
60. Select **VanArsdel** in the **Sum of Revenue by Manufacturer** visual (Treemap).
61. Then hold the **CTRL** key (to multi-select) and select **Australia** within the **Sum of Revenue by Country** visual. This will multi-select and highlight both values.
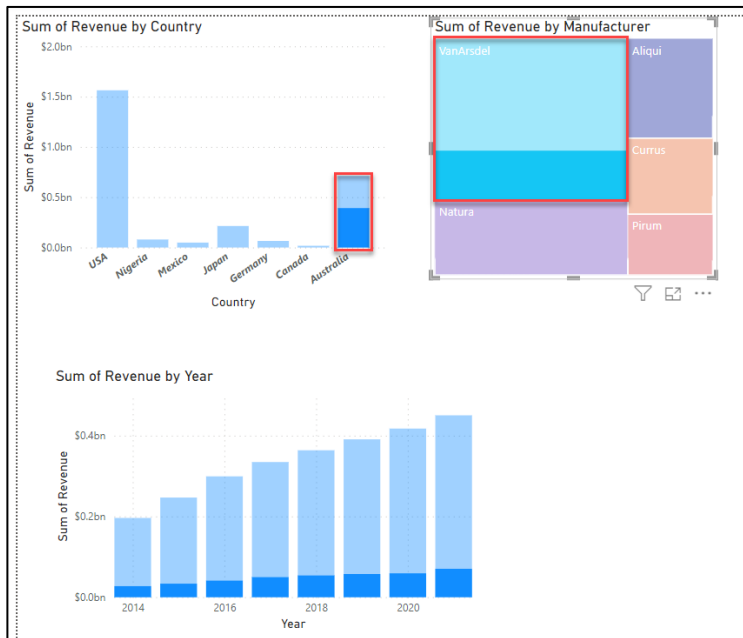
With both **VanArsdel** and **Australia** selected we can see a spike in 2021 sales for VanArsdel in Australia. This spike in sales is intriguing, so let's investigate further.

62. Hover over the Sum of Revenue by Year visual. Select the **down arrow** at the top of the **Sum of Revenue by Year** visual to enable the **drill-down** capability.
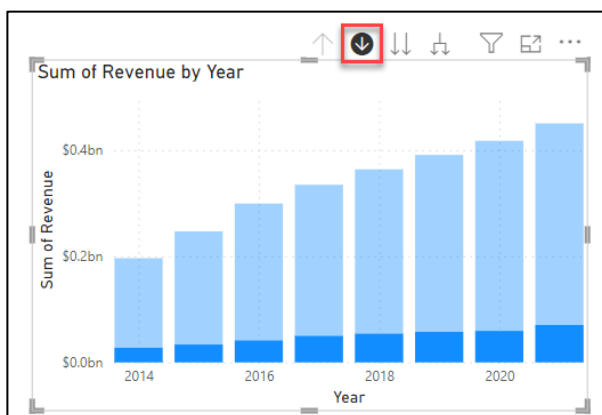
63. Select the **2021** column within the **Sum of Revenue by Year** visual.
Notice that you have drilled down to the **quarter** level of 2021. There was a big spike in the fourth quarter. Let's dig further.
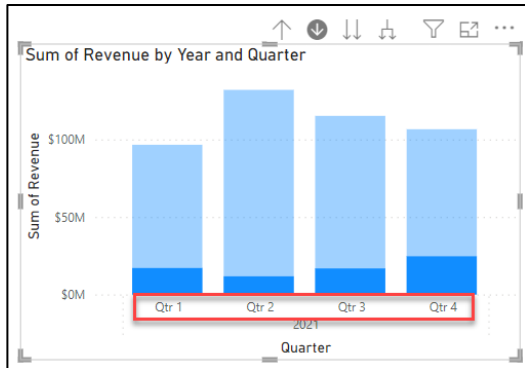
64. Select the **double down-arrow icon** at the top of the **Sum of Revenue by Year and Quarter** visual. This **drills down** to the next level of the hierarchy, which is the **month** level.
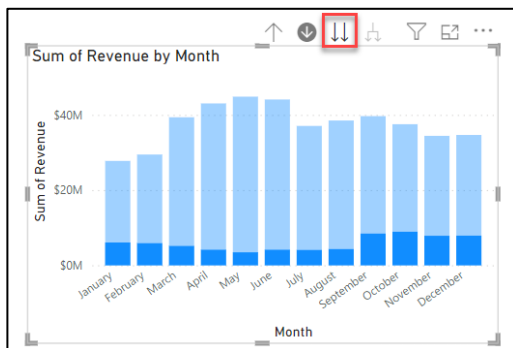
65. Select the **up-arrow icon** at the top of the **Sum of Revenue by Month** visual to **drill back up** to the **Quarter** level again.
66. Select the **drill up icon** a second time to go all the way back up to the **Year** level.
67. Select the **split arrow icon** at the top of the **Sum of Revenue by Year** visual. This expands down to the next level of the hierarchy, which is quarters for *all* the years; not just 2021. Resize the visual as needed.
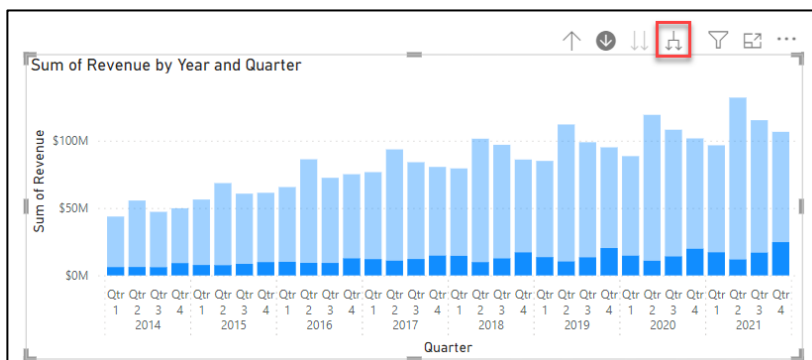
Notice that the fourth-quarter sales have always been high, but in 2021 there was a larger sales spike in the fourth quarter than usual.

68. Now let's expand down one more time to the **month** level. Select the **split arrow icon** for the **Sum of Revenue by Year and Quarter** visual again. This drills down to the next level of the hierarchy; this now shows revenue for **months** for all the years.

Power BI Desktop – Data Exploration Continued

Now that we've explored the data, let's add a **slicer** so we can filter by the manufacturers.

69. Start by ensuring there are no filtered or highlighted values. To ensure no values are currently selected in your report visuals select the blank space of the **Sum of Revenue by Country** visual. This will clear any currently selected values.
70. Select the white space in the canvas. From the **Data** pane, select the checkbox next to the **Manufacturer** field in the **Manufacturer** table**.**
71. From the **Visualizations** pane, select the **Slicer** visual.
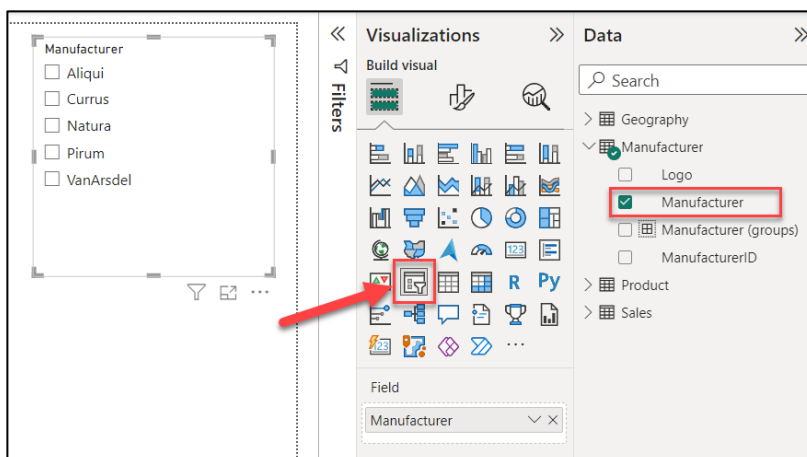
72. Here you will see a list of Manufacturers. Select **VanArsdel** and notice that all the visuals are filtered based on your selection. Also, re-select **Australia** in the **Sum of Revenue by Country** visual.
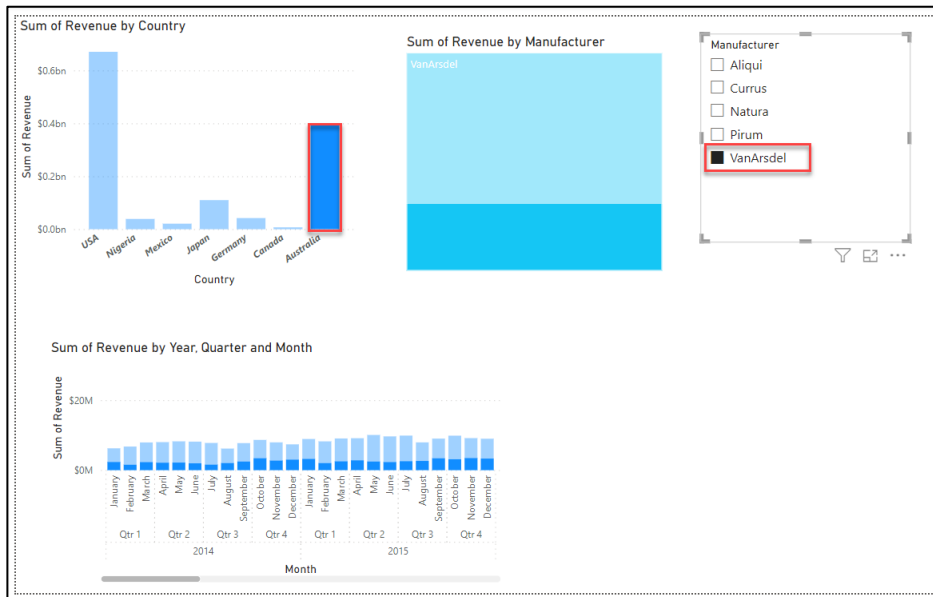
73. With the **Slicer** visual still selected, navigate to the **Format visual** tab of the **Visualizations** pane. Expand the **Slicer settings** menu. Then, expand the **Options** menu within the **Slicer settings**.
74. Select the drop-down for the **Style** section within the **Options** menu. From the drop-down, select **Dropdown**.
75. Then, within the **Slicer** visual, select **VanArsdel** from the Manufacturer dropdown.
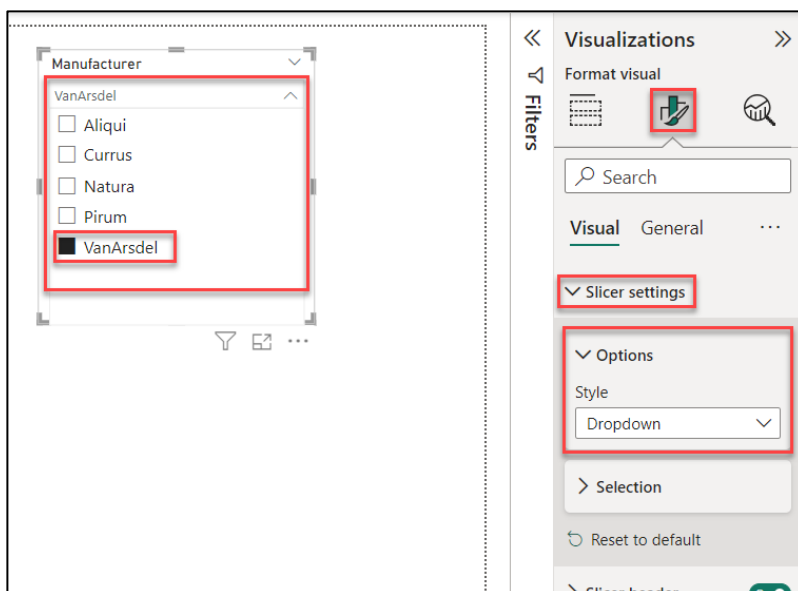
76. Confirm **Top Competitors** and **VanArsdel** are still selected in the **Manufacturer (groups)** filter in the **Filters** pane.
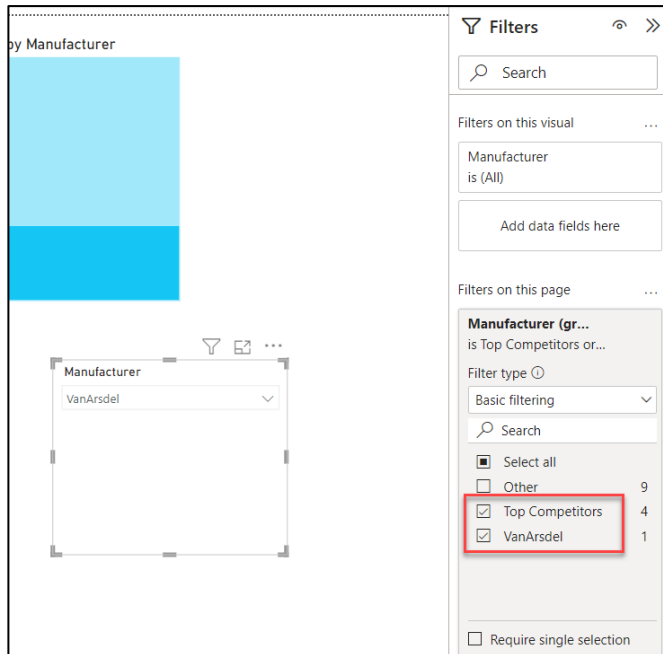
> ***Note:*** *There is a box for **Filters on all pages** in the **Filters** pane. If you have more than one report page, this is how you sync a filter for the whole file.*

Now let's use the **Manufacturer** slicer to analyze one manufacturer at a time.

77. First, de-select the **Australia** column within the **Sum of Revenue by Country** visual so the report is no longer filtered by country.
78. Next, select the **Sum of Revenue by Manufacturer** (Treemap) visual.
79. From the **Visualizations** pane, select the **Card** visual.
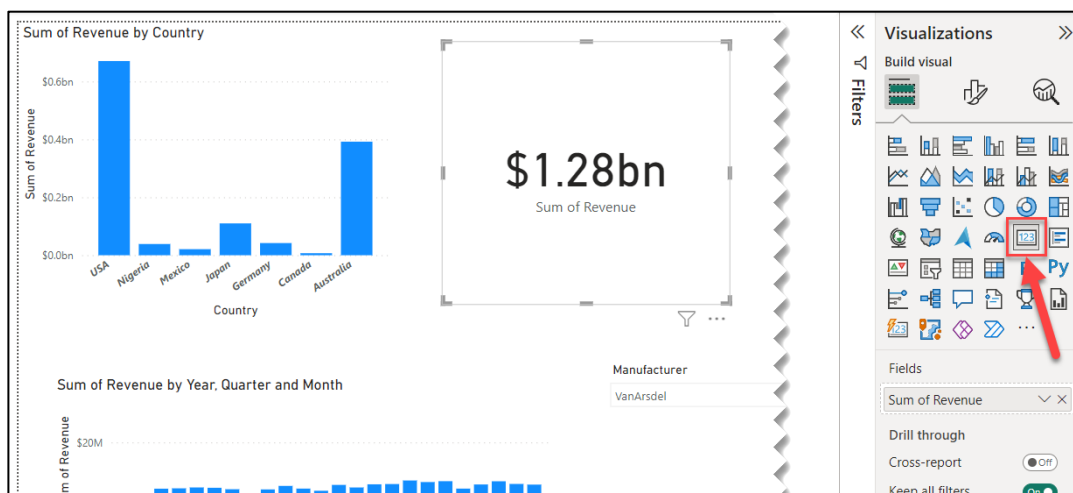
The card visual gives us the **Sum of Revenue** as we filter and cross-filter the visuals.

Notice that all key dimensions are in tables with related attributes, except for the date. For example, **Product** attributes are in the **Product** table. **Manufacturer** attributes are in the **Manufacturer** table. Now let's create a **Date** table.

80. Navigate to the **Table** view by selecting the **Table** icon within the **Navigation** menu to the left of Power BI Desktop.
81. From the ribbon at the top of the screen, select the **Table Tools** tab, then choose **New Table** from the menu at the top of the screen.
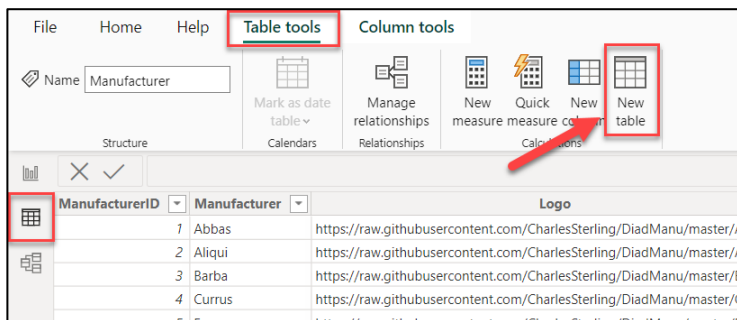
Notice that a new table called "Table" is created in the **Data** pane to the right of the Power BI Desktop and the formula bar opens at the top of your screen.

82. Enter the following formula in the formula bar, then hit **Enter** on your keyboard:

Date = CALENDAR(DATE(2014,1,1), DATE(2022,12,31))

A **Date** table with a **Date** column is created.
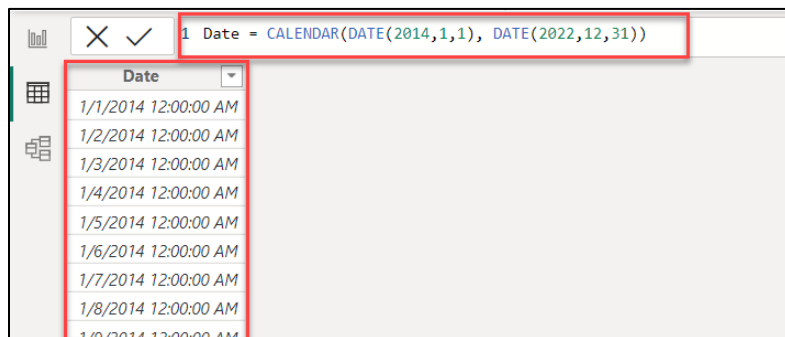
We are using two DAX functions: the **CALENDAR** function, which accepts the start and end data, and the **DATE** function, which takes the **year**, **month**, and **date** Fields.

For this lab, we will create dates from **2014 to 2021** (since we have data for those years). We can also add more **Fields** - such as **Year**, **Month**, **Week**, etc. - to this table by using additional DAX functions.

83. Within the **Data** pane to the right of the screen, select the **Date** field in the **Date** table.
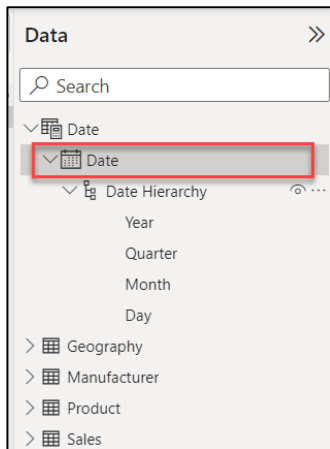
Notice that the **Date** field is of the data type **Date/Time**. Let's change it to the **Date** data type.

84. From the ribbon, select the **Column Tools** tab, choose the **Data type** drop-down, and then select **Date**.
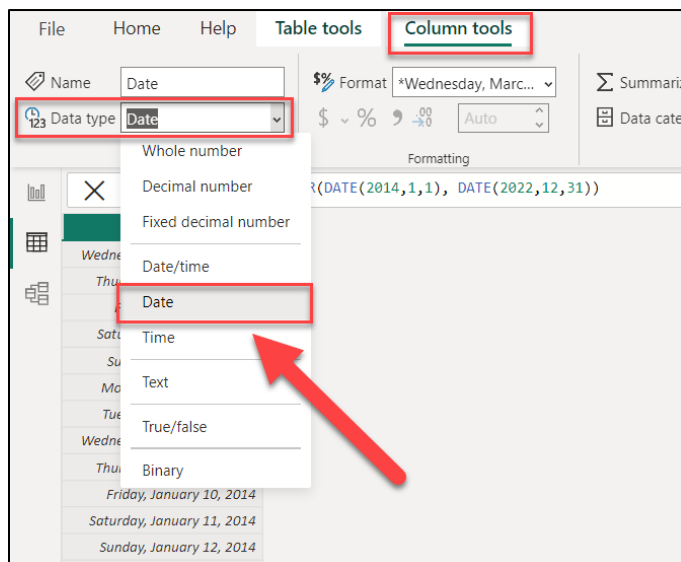
Next, we need to create a relationship between the newly created **Date** table and the **Sales** table.

85. From the ribbon, select the **Column Tools** tab, and then choose **Manage Relationships**.
86. A **Manage Relationships** dialog box opens. Select the **New** button.
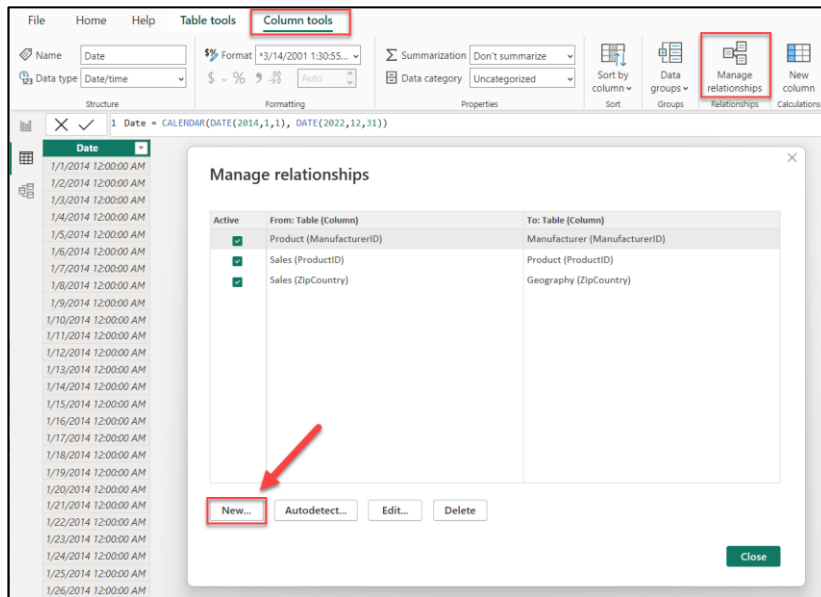
87. A **Create Relationship** dialog box opens. Select **Date** from the **top** dropdown menu.
88. Select **Sales** from the second dropdown menu.
89. Highlight the **Date** field in **both tables** by multi-selecting (using your **Ctrl** key on your keyboard).
90. Then, select **OK** to close the **Create relationship** dialog box.
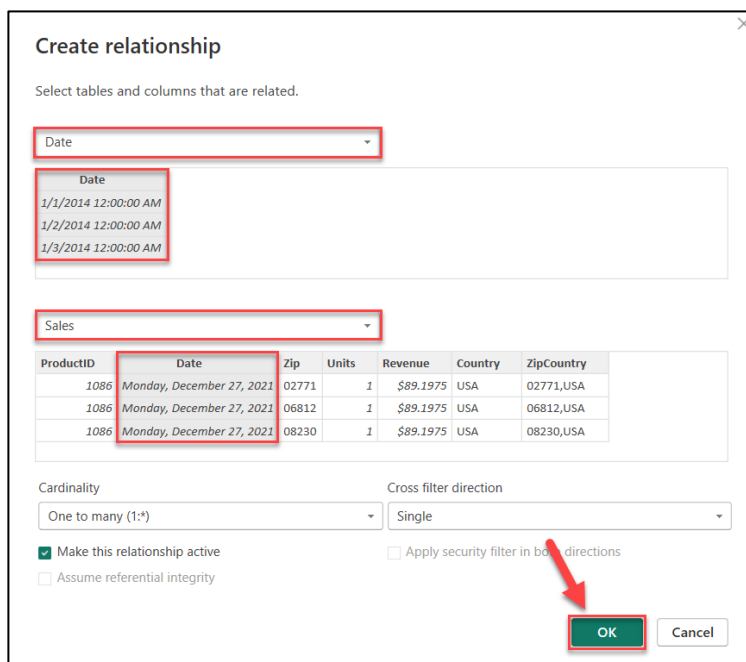
91. Select the **Close** button to close the **Manage relationships** dialog box.
92. Navigate to the **Report** view by selecting the **Report** icon within the **Navigation** menu to the left of the Power BI Desktop.
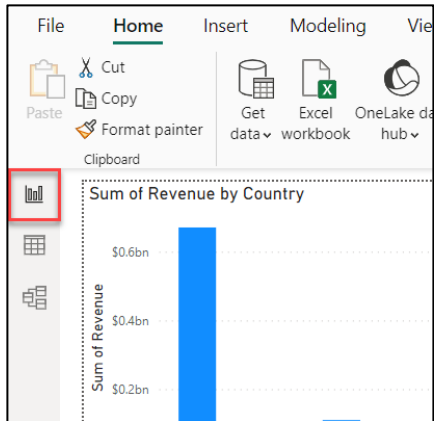
Notice that the **Sum of Revenue by Date** chart looks different now. Let's fix it.

93. Select the **Sum of Revenue by Date** visual.
94. From the **X-axis** section within the **Visualizations** pane, select the **X** to remove the **Date** field.
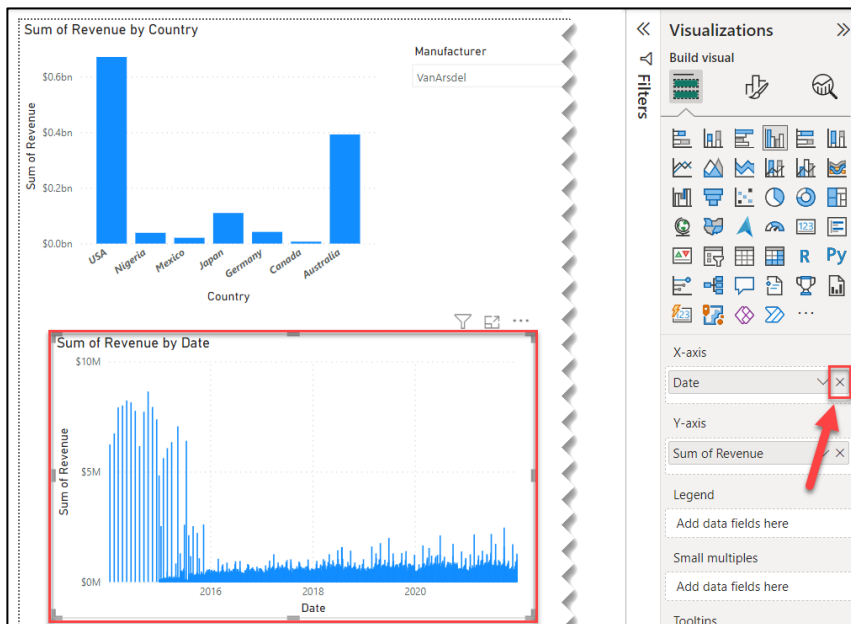
95. From the **Data** pane, expand the **Date** table.
96. Now, drag and drop the **Date** field from the **Date** table to the **X-axis** section within the **Visualizations** pane.
97. Select the **Drill up** button above the visual, that you learned about previously, until the visual appears to be at the **Year** level.
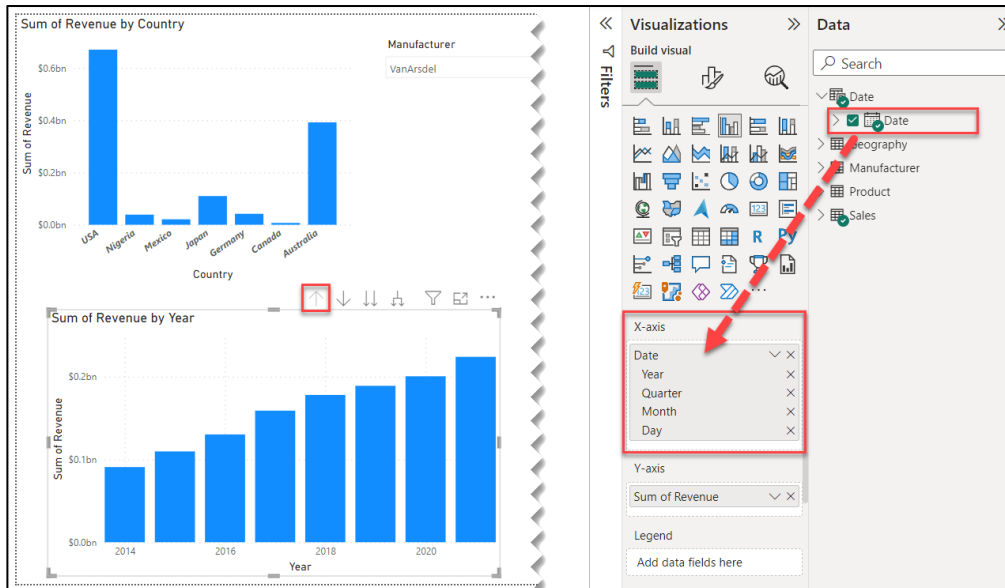
Notice that the new **Date** field behavior is like it was previously.

Since there are now two **Date** fields, it may be confusing to know which one to use. To accommodate this, let's hide the **Date** field in the **Sales** table.

98. From the **Data** pane, hover over and select the **ellipses (…)** to the right of the **Date** field in the **Sales** table. Then, select **Hide** from the options menu.
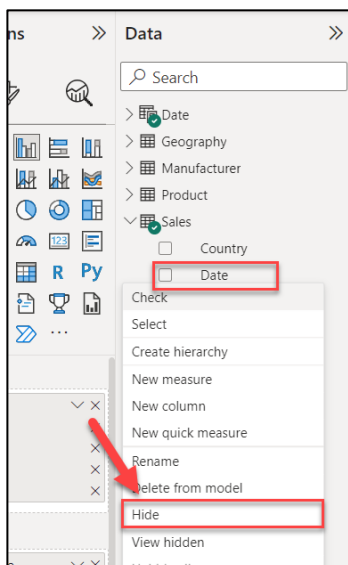
99. Using the same process as in the previous step, hide **Country**, **ProductID**, **Zip**, and **ZipCountry** within the **Sales** table as well. All that should remain within the **Sales** table is the **Revenue** and **Units** fields.

100. Next, hide **ZipCountry** from the **Geography** table.

101. Then, hide **ManufacturerID** from the **Manufacturer** table.

102. Hide **ProductID** and **ManufacturerID** from the **Product** table.

> *Tip*: It is a best practice to hide fields that are not used in your report visuals. These fields are the basis of our relationships between each table so we should not delete them.

Now let's get back to our data story, Australia, VanArsdel and 2021. Let's check if the spike occurred in a specific region in Australia.

103. Select the **Sum of Revenue by Country** visual.

104. From the **Data** pane, drag and drop the **State** field from the **Geography** table *below* the **Country** field within the **X-axis** section of the **Visualizations** pane.
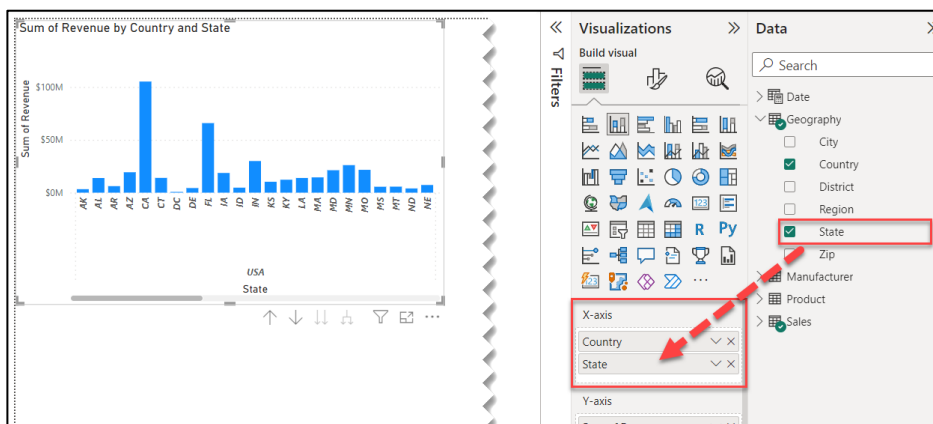
105. Drag and drop the **District** field from the **Geography** table *below* the **State** field in the **X-axis** section of the **Visualizations** pane.
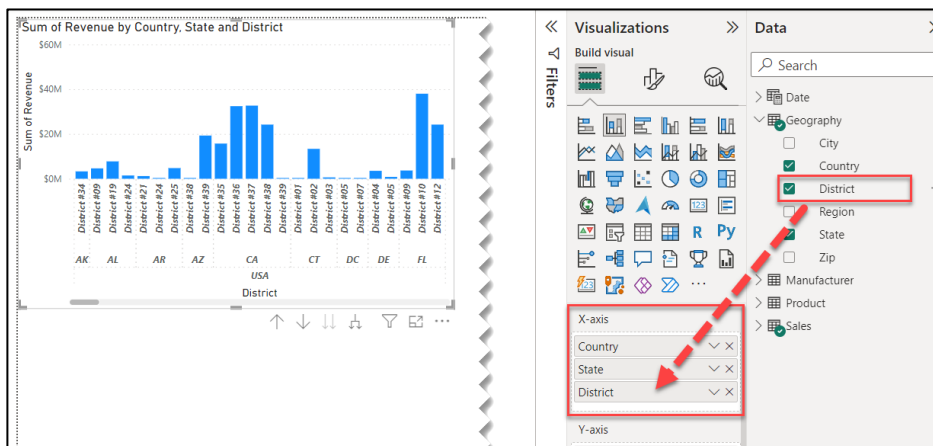
We have just created a hierarchy.

106. Select the **up arrow** within the **header** area of the visual **twice** to **Drill up** to the **top level** of the hierarchy again.
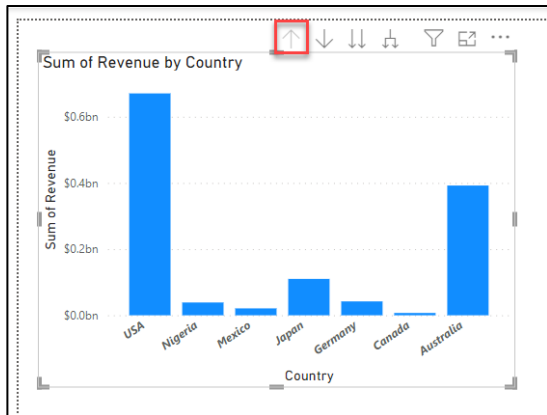
107. Ensure that **VanArsdel** is still selected within the **Manufacturer slicer**.
108. Enable **Drill down mode** by selecting the **down arrow** of the **Sum of Revenue by Country** visual once.
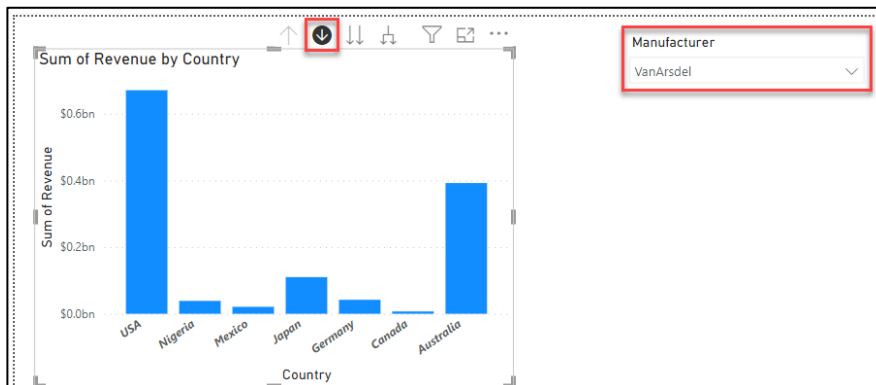
109. Select **Australia** to drill down to the **State** level.
110. From the **Sum of Revenue by Year** visual, select **2021** and notice what happens to the **Sum of Revenue by Country**.

> *Tip*: If you notice this step performs a drilldown into a table of data select Back to report and then Data / Drill and disable Data point table in the ribbon.

111. Now, **Drill up** to the **Country** level again.
112. Select **2021** again in the **Sum of Revenue by Year** visual to undo the cross-highlighting.
113. **Disable** drill mode by selecting the down arrow again on the **Sum of Revenue by Country** visual.

Now let's analyze the data by product. We'll start by creating a product hierarchy.

114. Ensure that no visuals are selected within the design canvas. From the **Data** pane, select the **ellipses** (**...**) to the right of the **Category** field in the **Product** table.
115. Select **Create Hierarchy**.
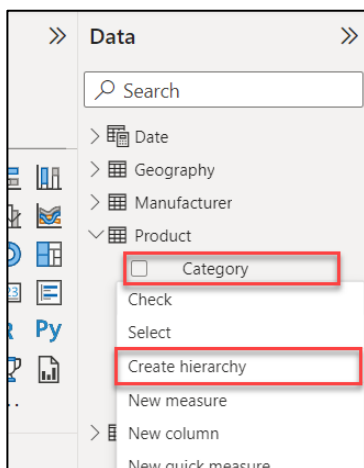
Notice that a new object called **Category Hierarchy** is created inside the **Product** table.

116. Double-click **Category Hierarchy** and **rename** it to **Product Hierarchy**.
117. Select the **ellipses (…)** to the right of the **Segment** field within the **Product** table.
118. Select **Add to Hierarchy**, and then choose **Product Hierarchy**.
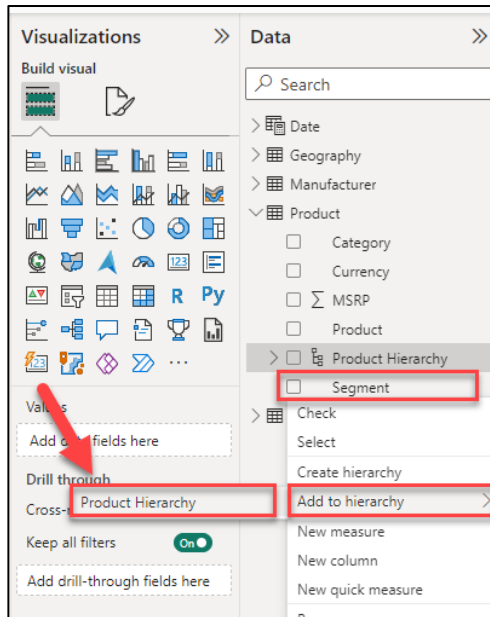
119. Using the same steps, add the **Product** field from the **Product** table to the **Product Hierarchy**. We have now created a **Product Hierarchy** with the fields **Category**, **Segment**, and **Product**.
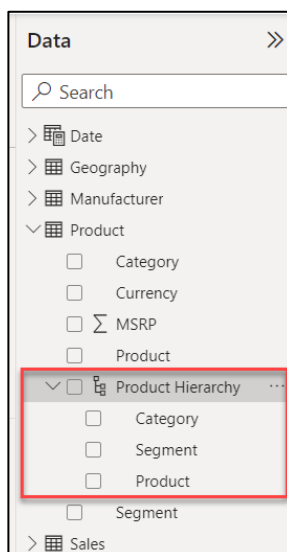
120. Select the white space within the canvas de-select any visual that may be selected. From the **Visualizations** pane, select **Clustered bar chart**.
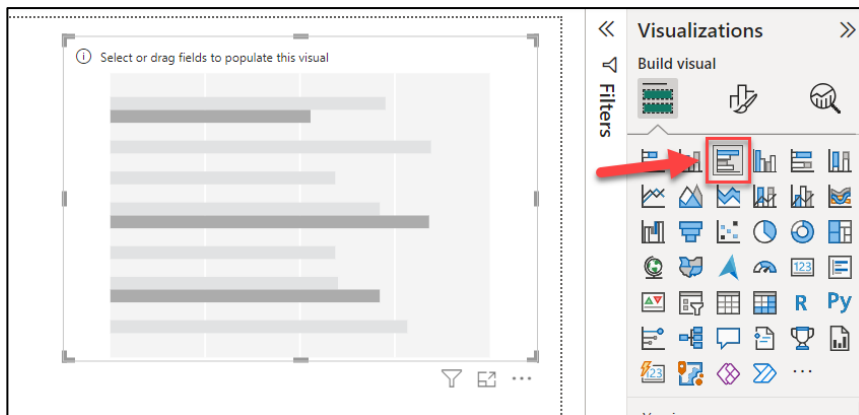
121. With the **Clustered bar chart** still selected, from the **Data** pane, expand the **Product** table.
122. Select the **checkbox** to the left of the **Product Hierarchy**. Notice the complete hierarchy is selected.
123. From the **Data** pane, expand the **Sales** table.
124. Select the **checkbox** to the left of the **Revenue** field.

Notice that the Product Hierarchy is added to the Y-axis field and Sum of Revenue is added to the X-axis field within the Visualizations pane. You will see the visual within the canvas change and update as you select these different fields.
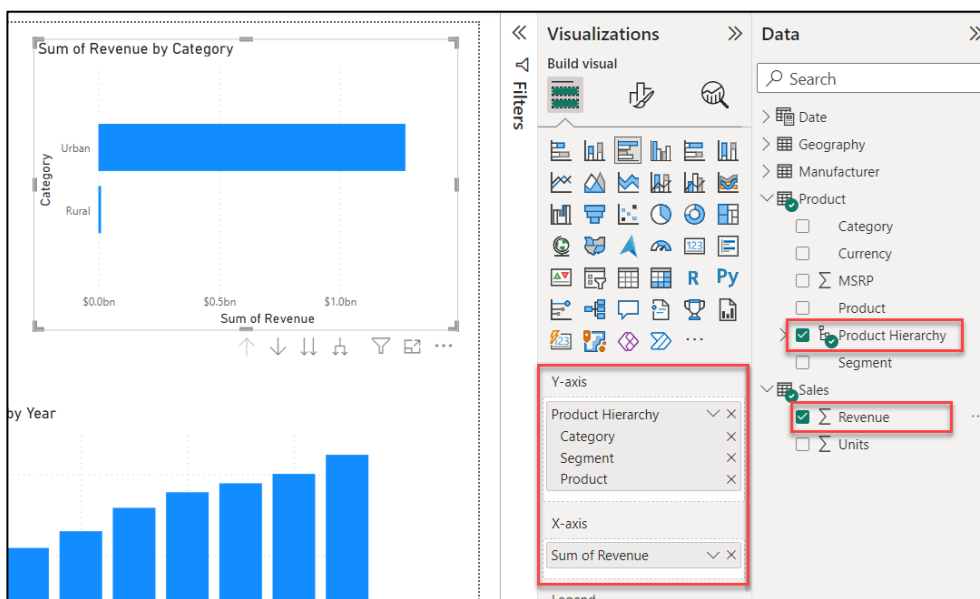
Now let's add a Matrix visual so we can view the data in rows and columns. We can apply conditional formatting to the matrix visual to highlight the outliers.

125. Select the **Sum of Revenue by Category** Clustered bar chart and change it to a **Matrix** visual.
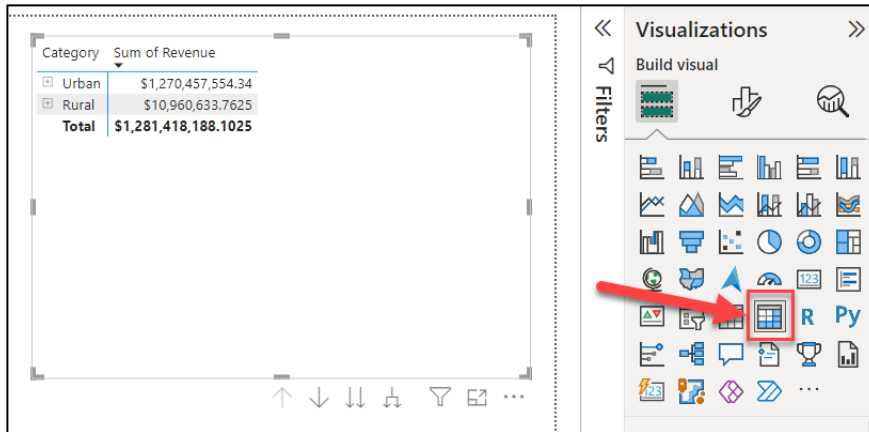
126. Select the **+** (plus sign) to the left of the **Urban** row to drill down.
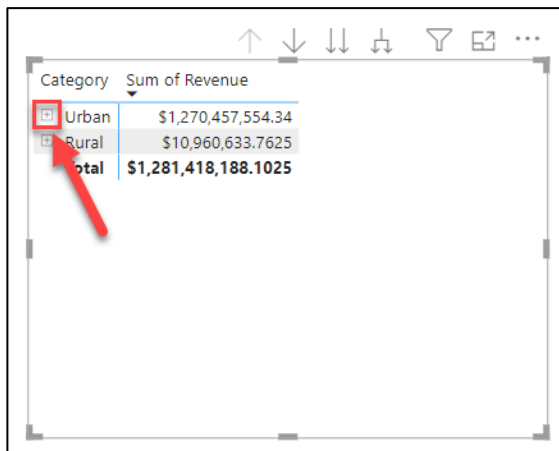
Let's add the percentage of the total field to the visual to give us a better perspective on the data.

127. With the **Matrix** selected, navigate to the **Data** pane.
128. From the **Data** pane, drag and drop the **Revenue** field from the **Sales** table to below the existing **Sum of Revenue** field in the **Values** section of the **Visualizations** pane. It will look like you have **Sum of Revenue** twice in the **Values** section.
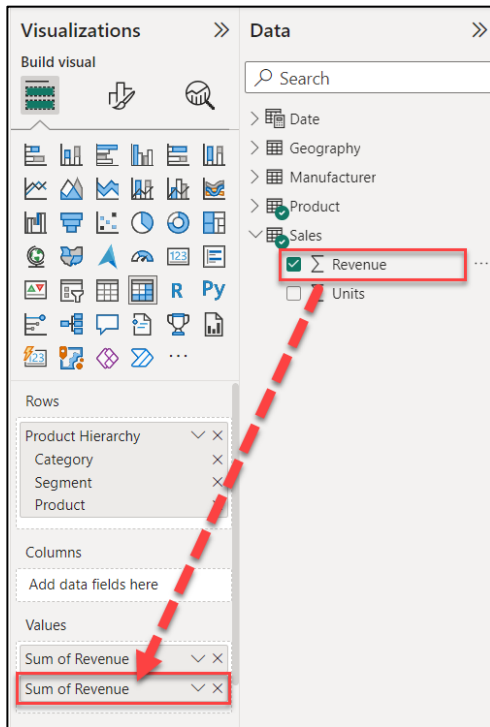
129. Select the **down arrow** to the right of the newly added **Sum of Revenue** field in the **Values** section.
130. From the visual field menu, hover over **Show value as** and then select **Percent of grand total**.
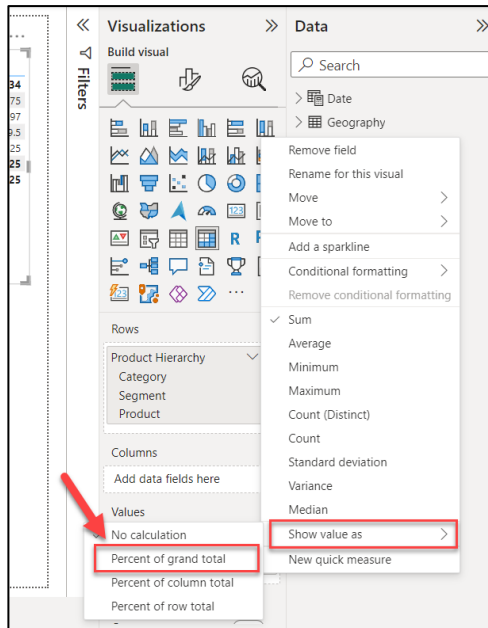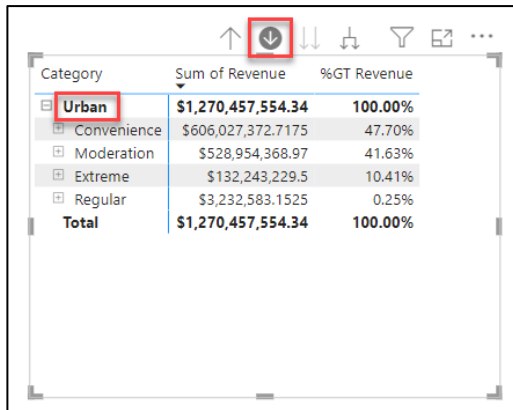
131. Right-click on the newly created field and select **Rename for this visual**. Name the field **%GT Revenue**.
132. Drill back up to **Category** level if you are not already there within the **Matrix** visual.

133. Then, select **Enable drill down mode** within the header of the **Matrix** visual
134. Now, select **Urban** (the *word*, not the + sign)
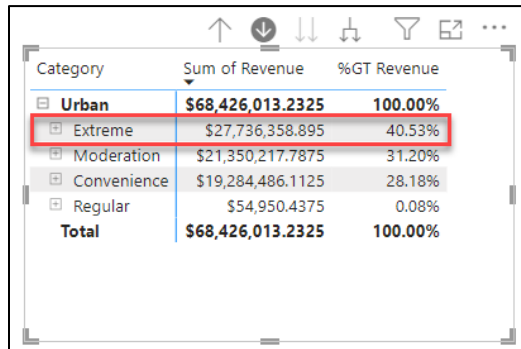
135. Ensure that the **Matrix** visual is still selected. Then, using the **Ctrl** key on your keyboard, multi-select the **2021** column within the **Sum of Revenue by Year** visual and the **Australia** column within the **Sum of Revenue by Country** visual.

Now let's look at the **Extreme** category for Australia over time.
Notice that the **Extreme** segment has around **40%** of the grand total.
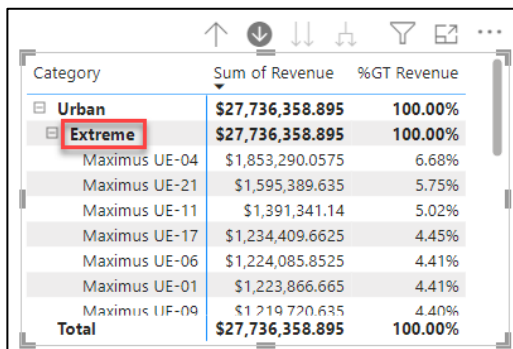
Now let's **drill down** into the **Extreme Segment** to determine if a Product stands out.

136. Within the **Matrix** visual, select the **Extreme** row (the *word*, not the + sign) to **drill down** to the **Product** level.
137. Resize the visual as needed.
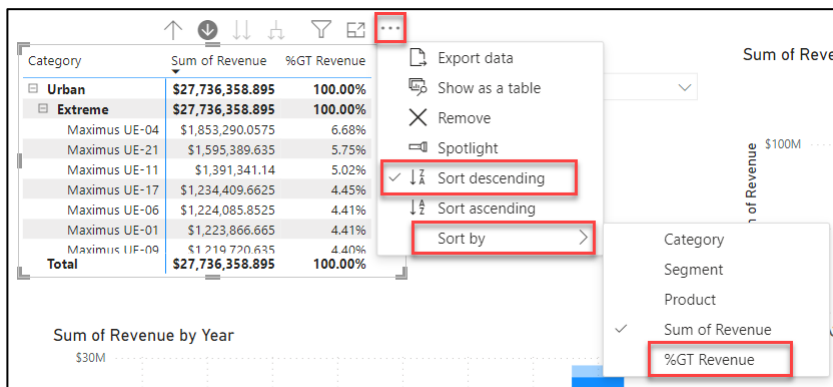
138. Select the **ellipses (…)** in the top right corner of the matrix visual header.
139. Select **Sort By > %GT Revenue** and ensure that **Sort Descending** is also selected (this should be the default).

We can now see the top Products.

140. Ensure **2021** is selected in the **Sum of Revenue by Year** visual, and **Australia** in the **Sum of Revenue by Country** visual. Notice that **Maximus UE-04** and **Maximus UE-21** are the top products. Also, notice that Product **Maximus UE-04** has nearly **7%** of the grand total.
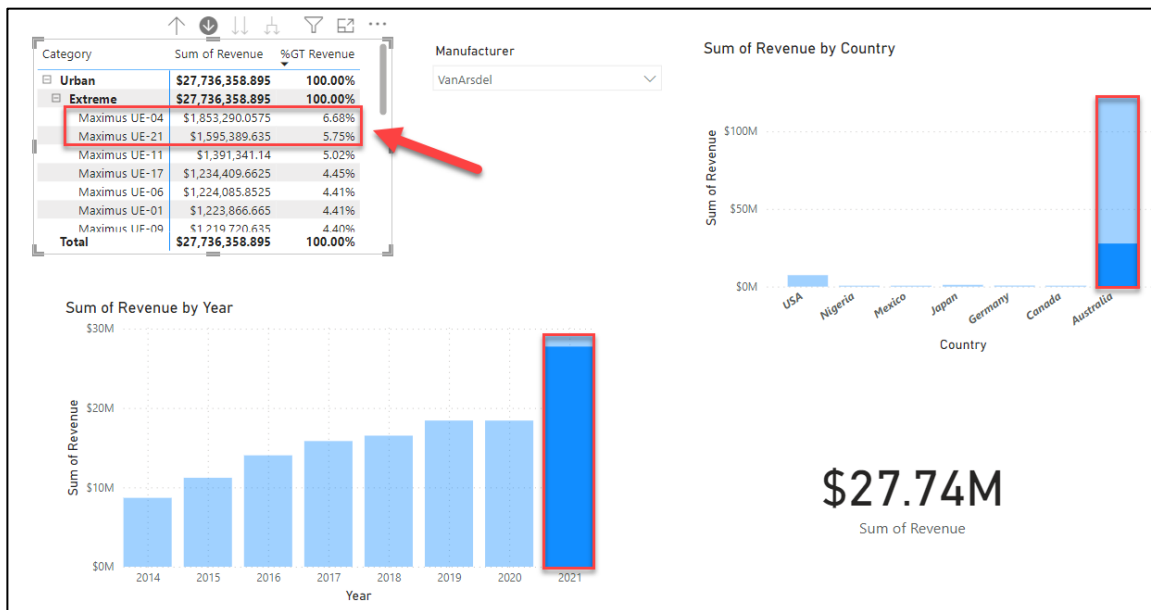
Earlier we created a calculated column named **ZipCountry** using DAX. Now let's create a **Percent Growth** calculated measure so we can compare sales over time. We are going to do this in two steps.

But first, what's the difference between a measure and a calculated column?

- A **Calculated column** is evaluated row by row. We extend a table by adding calculated columns.
- A **Measure** is used when we want to aggregate values from many rows in a table.

141. Within the **Data** pane, select the **Sales** table.
142. From the ribbon at the top of the screen, select the **Table Tools** tab, then select **New Measure**. A formula bar will appear.
143. Enter **PY Sales = CALCULATE(SUM(Sales[Revenue]), SAMEPERIODLASTYEAR('Date'[Date]))**
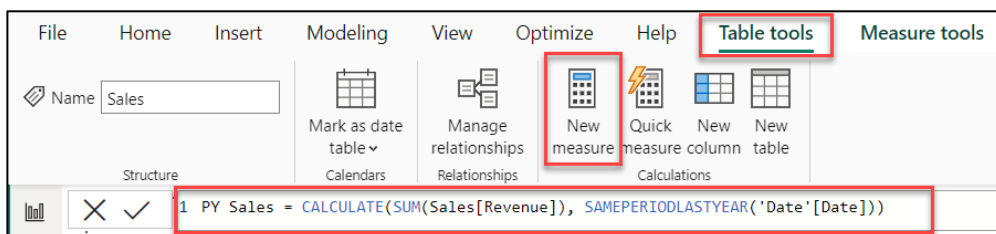
144. Select the **checkmark** to the left of the formula bar or hit **Enter** on your keyboard. You will see the **PY Sales** measure is created within the **Sales** table.
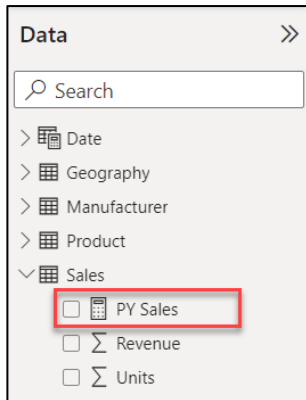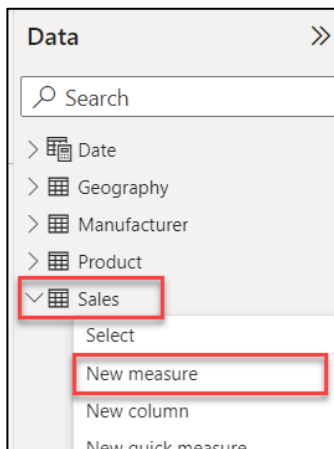

Let's create another measure using a different method.

145. In the **Data** pane, hover over the **Sales** table.
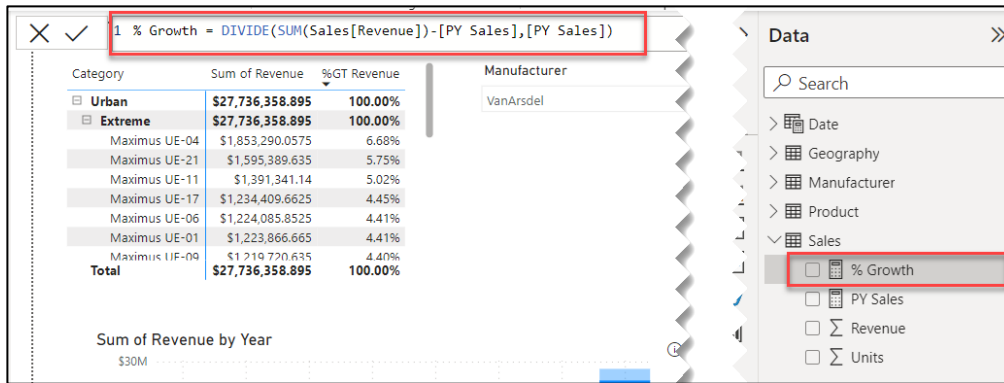146. Select the **ellipses (…)** to the right of the table name.
147. Select **New Measure** from the options menu. A formula bar opens.

148. Within the formula bar, enter the following formula:

<p style="text-align:center; color:red;">**% Growth = DIVIDE(SUM(Sales[Revenue])-[PY Sales],[PY Sales])**</p>

149. Select the **checkmark** next to the formula bar or hit **Enter** on your keyboard. You will see the **% Growth** measure added to the **Sales** table.
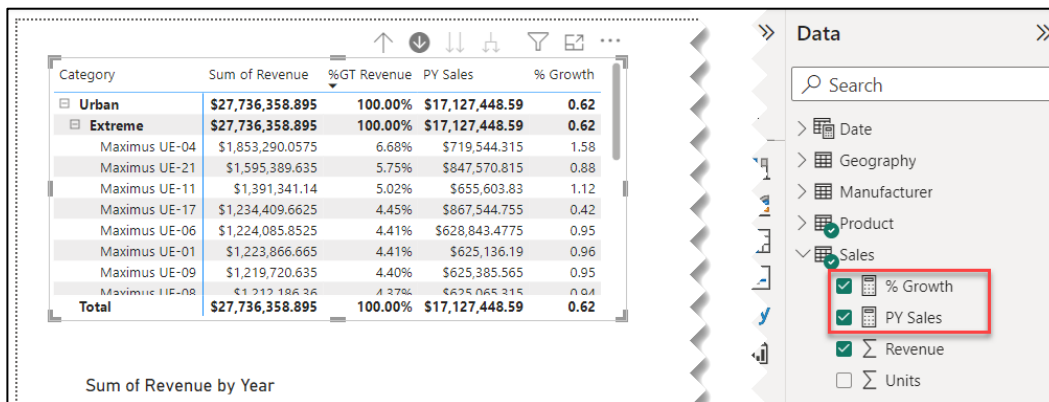
150. Ensure that the **Matrix** visual is still selected. If not, select the **Matrix** visual and also ensure that you still have the **Australia** and **2021** columns selected in the other visuals.
151. In the **Data** pane, select the **checkbox** next to the newly created **PY Sales** and **% Growth** measures within the **Sales** table. These measures should be added to the **Values** section of the **Matrix**.
152. Resize the **Matrix** to see these newly added fields. *(You may also have to adjust the size of the other visuals where needed)*

Notice that the fields need to be formatted.

153. From the **Data** pane, select the **% Growth** field (the *name*, not the checkbox) within the **Sales** table.
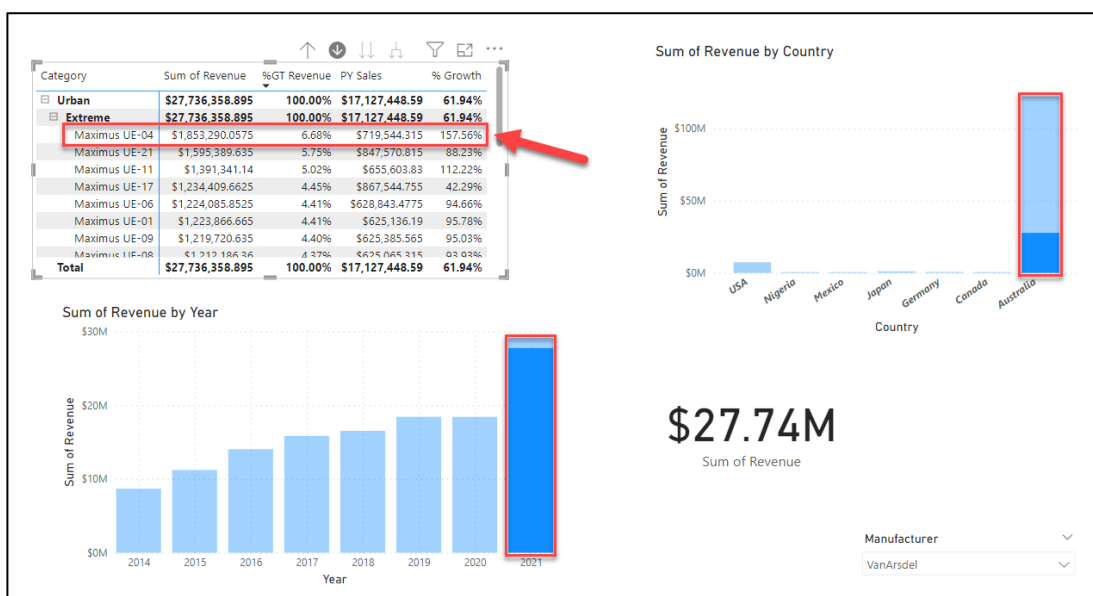154. From the ribbon at the top of the screen, select the **Measure Tools** tab, choose the **Format** drop-down, and then select **Percentage**.

*Tip: If your **% Growth** calculated measures shows as 0.00% at any point, double check that you still have **2021** and **Australia** selected as filters from the other visuals.*

155. Similarly, from the **Data** pane, select the **PY Sales** field (the *name*, not the checkbox) within the **Sales** table.

156. From the ribbon at the top of the screen, select the **Measure Tools** tab, choose the **Format** drop-down, and then select **Currency** (if it isn't already formatted to **Currency**).

157. Then, from the **Data** pane, select the **Revenue** field within the **Sales** table.

158. Using the same process, choose the **Format** drop-down under the **Table tools** tab, and then select **Currency** (if it isn't already formatted to **Currency**).

159. Ensure that **Australia** is still selected within the **Sum of Revenue by Country** visual, and the **2021** column is still selected within the **Sum of Revenue by Year** visual. Notice that **Maximus UE-04** has nearly **158%** growth compared to last year.


160. Select the white space within the canvas to **deselect** any of the possible selected visuals. Then, from the ribbon at the top of the screen, select **File** and choose **Save** from the menu to the left of the screen.
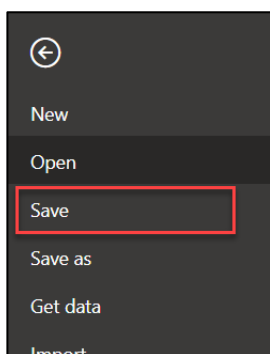
Congratulations! You have now completed Lab 2!

References

Dashboard in a Day introduces you to some of the key functions available in Power BI. In the ribbon of the Power BI Desktop, the Help section has links to some great resources.
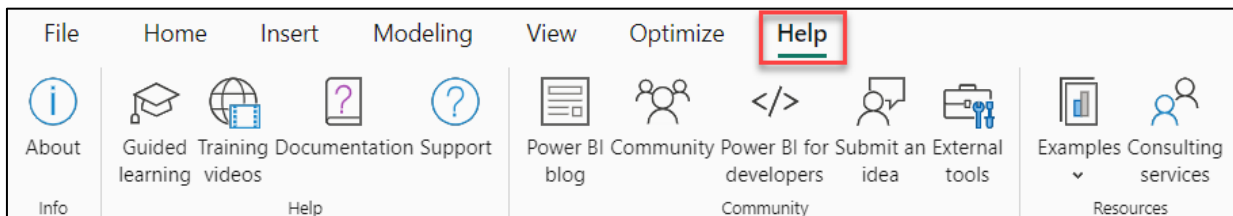
Here are a few more resources that will help you with your next steps with Power BI.

- Getting started: http://powerbi.com

- Power BI Desktop: https://powerbi.microsoft.com/desktop

- Power BI Mobile: https://powerbi.microsoft.com/mobile

- Community site https://community.powerbi.com/

- Power BI Getting started support page: https://support.powerbi.com/knowledgebase/articles/430814-get-started-with-power-bi

- Support site https://support.powerbi.com/

- Feature requests https://ideas.powerbi.com/forums/265200-power-bi-ideas

- New ideas for using Power BI https://aka.ms/PBI_Comm_Ideas

- Power BI Courses http://aka.ms/pbi-create-reports

- Power Platform https://powerplatform.microsoft.com/en-us/instructor-led-training/

- Power Apps Business Apps | Microsoft Power Apps

- Power Automate Power Automate | Microsoft Power Platform

- Dataverse What is Microsoft Dataverse? - Power Apps | Microsoft Docs

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