



Dashboard in a Day – Lab 2

Data Modeling and Exploration

by Power BI Team, Microsoft



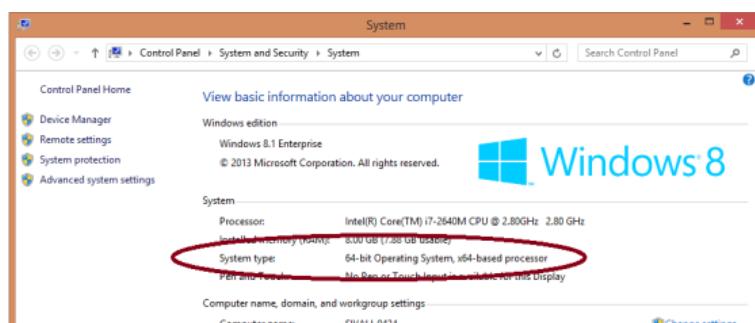
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Lab Prerequisites

Following prerequisites and setup must be complete for successful completion of the exercise:

- You must be connected to the internet.
- You must have Microsoft Office installed.
- **Signup for Power BI:** Go to <http://aka.ms/pbidiadtraining> and sign up for Power BI with a business email address. If you cannot sign up for Power BI, let the instructor know. If you have an existing account, please use the same url as above.
- At minimum, a computer with 2-cores and 4GB RAM running one of the following versions of Windows: Windows 8 / Windows Server 2008 R2, or later.
- If you choose to use Internet Explorer it will require version 10 or greater, you can also use Edge or Chrome.
- Verify if you have 32-bit or 64-bit operating system to decide if you need to install the 32-bit or 64-bit applications.
 - Search for computer on your PC, right click properties for your computer.
 - You will be able to identify if your operating system is 64 or 32 bit based on “system type” as shown below.



- **Download the Power BI Content:** Create a folder called **DIAD** on the C drive of your local machine. Copy all contents from the folder called **Dashboard in a Day Assets** to the **DIAD** folder you just created (C:\DIAD).
- **Download and install Power BI Desktop** using any one of the options listed below:
 - If you have Windows 10, use Microsoft App Store to download and install Power BI Desktop app.
 - Download and install Microsoft Power BI Desktop from <http://www.microsoft.com/en-us/download/details.aspx?id=45331>.
 - If you already have Power BI Desktop installed ensure you have the **latest version** of Power BI downloaded.
- **Download and install Power BI Mobile App on your mobile device**
 - If you are using an Apple product download and install the Microsoft Power BI Mobile app from the Apple store or this link <https://apps.apple.com/us/app/microsoft-power-bi/id929738808>
 - If you are using an Android product download and install the Microsoft Power BI Mobile app from the Google Play store or this link <https://play.google.com/store/apps/details?id=com.microsoft.powerbim>

Document Structure

This document is lab 02 of 05 labs in total.

If you are joining the DIAD at this point or were unable to complete Lab 01, please start this lab with the provided: "Lab 1 solution.pbix" file you can find in the Reports folder.

At the end of this lab you will have learned how to create a range of different charts, how to highlight and cross filter and create new groups and hierarchies. You will also know how to add new measures to the model to do additional analysis.

The document flow is in a table format. On the left panel are steps the user needs to follow and in the right panel are screenshots to provide a visual aid for the users. In the screenshots, sections are highlighted with red boxes to highlight the action/area user needs to focus on.

NOTE: This lab is using real anonymized data and is provided by ObviEnce LLC. Visit their site to learn about their services: www.obvience.com.

This data is property of ObviEnce LLC and has been shared for the purpose of demonstrating Power BI functionality with industry sample data. Any uses of this data must include this attribution to ObviEnce

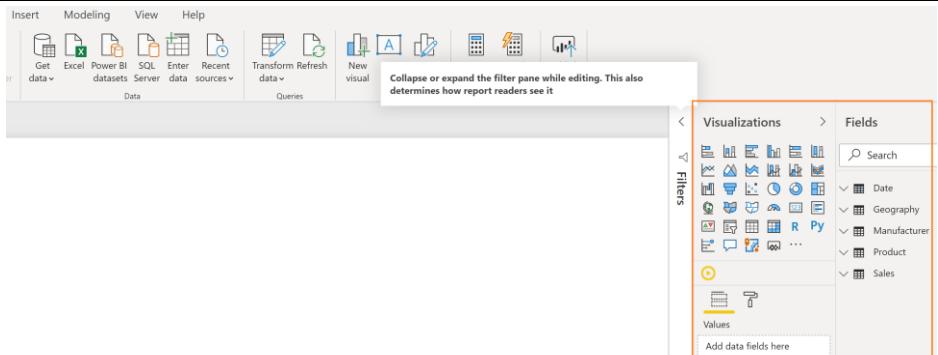
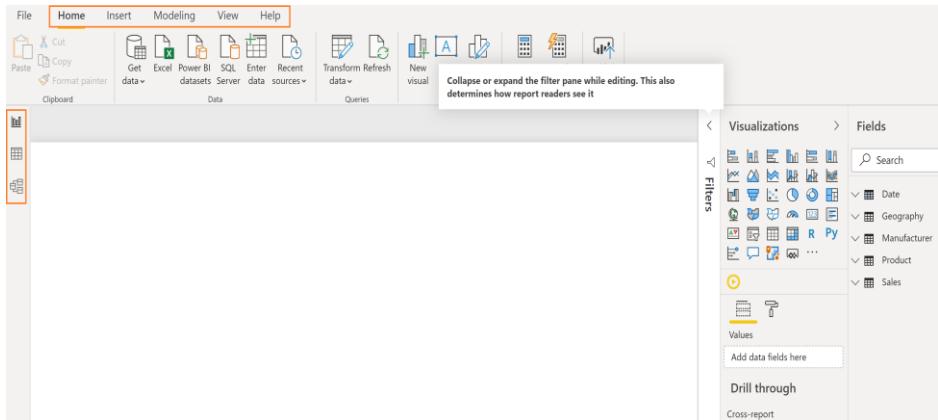
Power BI Desktop – Data Modeling and Exploration

In this section, we will learn the [key parts of the Power BI desktop](#), to model and explore the data and build visuals.

Power BI Desktop - Layout

You will land on the main **Power BI Desktop** window. Let's get familiar with the distinct sections available in the Power BI Window.

1. On the top, you see the **Home** tab where the most common operations you perform are available.
 2. **Modeling** tab in the ribbon enables additional data modeling capabilities like adding custom columns and calculated measures.
 3. **View** tab has options to format the page layout.
 4. **Help** tab provides self-help options like guided learning, training videos and links to online communities, partner showcase and consulting services.
 5. On the left side, you have three icons, **Report**, **Data** and **Model**. If you hover over the icons, you can see the tool tips. Switching between these allows you to see the data and the relationships between the tables.
-
6. The center **white space** is the canvas where you will be creating visuals.
 7. **Visualizations** panel on the right allows you to select visualizations, add values to the visuals and add columns to the axes or filters.
 8. The **Fields** window on the right panel, is where you will see the list of tables which were generated from the queries. Click the  icon next to a table name to expand to the field list for that table.



9. Click on the Data icon. Expand **Sales** table in the **Fields** as shown in the figure

Scroll up and down to notice how fast you can navigate through ~ 3 Million rows.

The screenshot shows the Power BI Desktop interface with the 'Table tools' ribbon selected. In the 'Fields' pane on the right, the 'Sales' table is expanded, indicated by an orange border around its icon. The table preview shows approximately 3 million rows of sales data. The columns include ProductID, Date, Zip, Units, Revenue, and Country.

10. Click on the **Model** icon on the left panel of Power BI Desktop.

You will see the tables you have imported along with some Relationships. The Power BI Desktop automatically infers relationships between the tables.

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

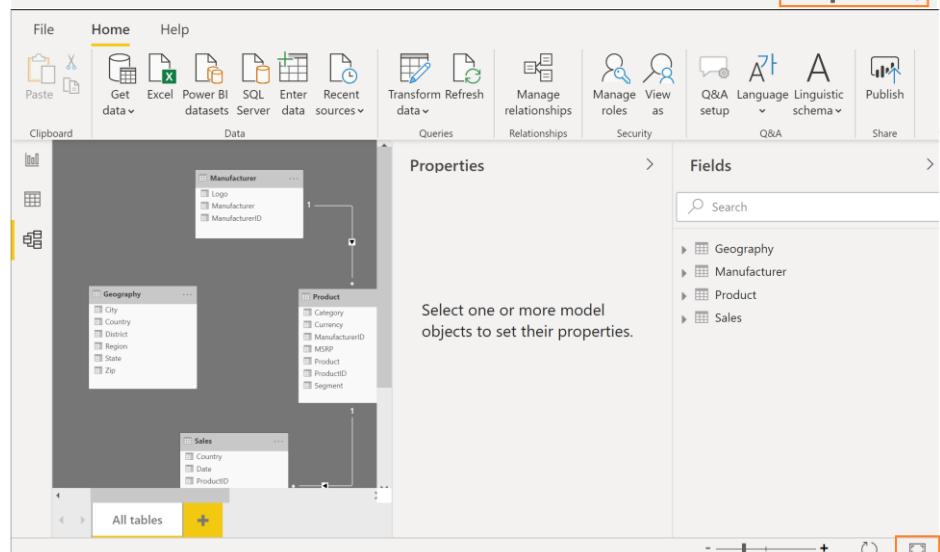
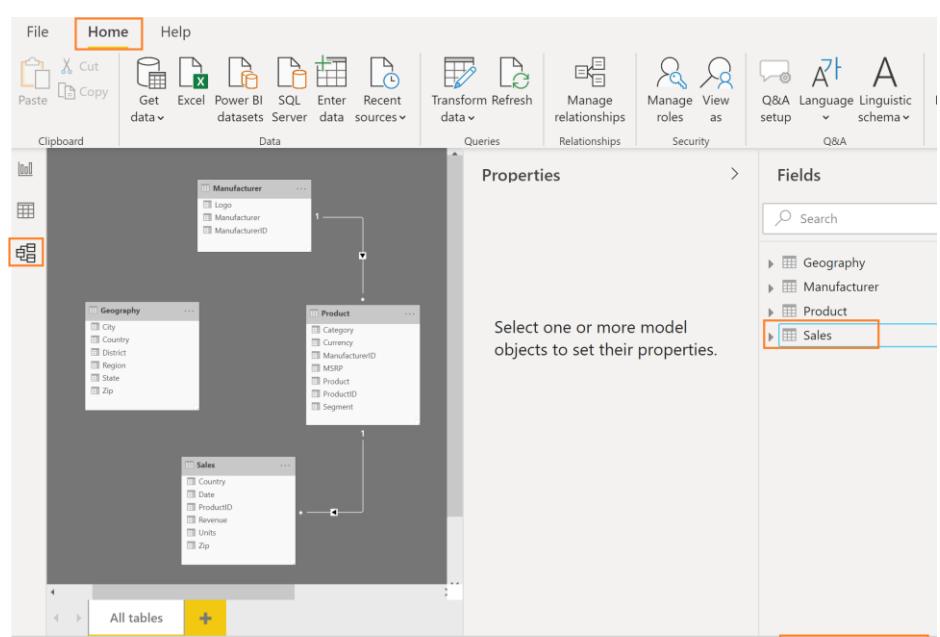
Power BI supports multiple types of relationships:

- 1 to many
- 1 to 1
- Many to many

In this lab we will be using 1 to many type of relationship. This is 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 the lab.

Note: Tables may not appear as shown in the figure. You can zoom in and out of the Relationships page by dragging the zoom slider in the bottom right corner of the window. Also, if want to ensure you are seeing all the tables, use the fit to

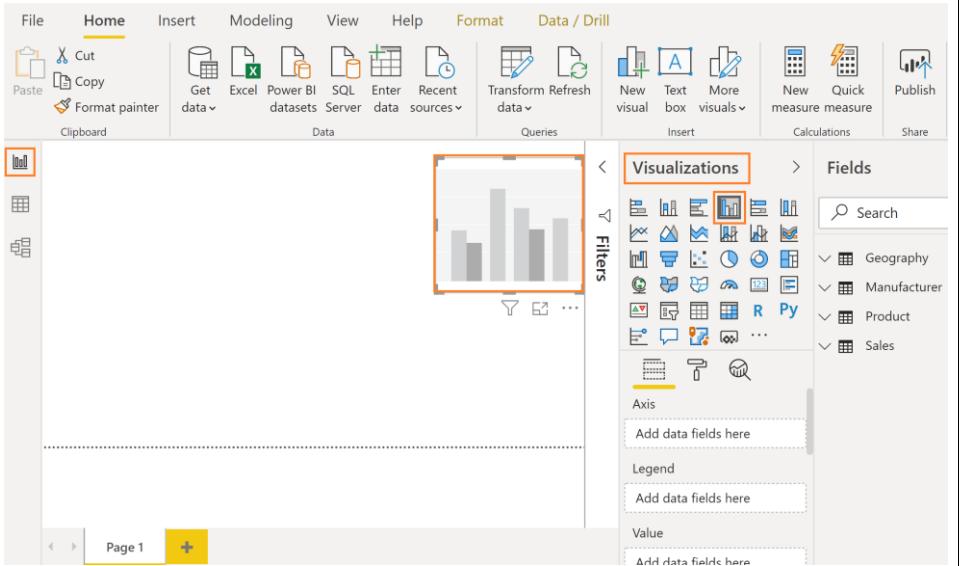


screen icon:  . Drag and move the tables to appear as shown in the figure.

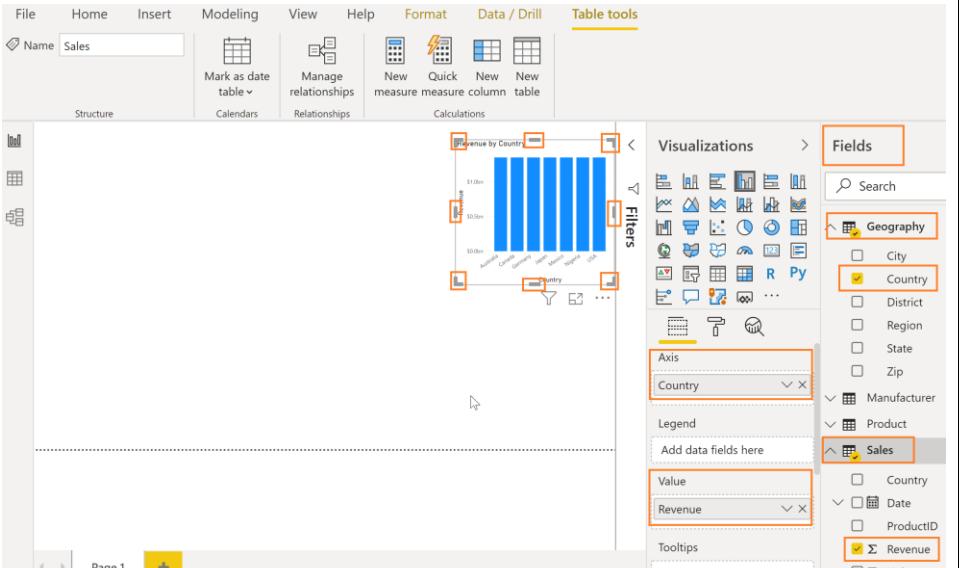
Power BI Desktop – Data Exploration

We loaded data from different countries. So, let's start with analyzing sales by country.

11. Click on the **Report** icon on the left panel to navigate to the Report view.
12. Select the **Clustered column chart** visual in **Visualizations** as shown in the screenshot.



13. From the **FIELDS** section, expand **Geography** table and click the checkbox next to the **Country** field.
14. From the **FIELDS** section, expand **Sales** table and click the checkbox next to the **Revenue** field.
15. **Resize** the visual as needed by dragging the edges.
Notice revenue of each country is the same. Now we need to create a relationship between the Sales and Geography tables



16. Click on the **Model** icon on the left panel to navigate to the Relationship view.

17. Sales data is by Zip code. Hence, we need to connect Zip column from Sales table with Zip column in Geography table. You can do this by dragging the **Zip** field in **Sales** table and connecting the line with **Zip** field in **Geography** table.

You will notice 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 Geography. This is because multiple countries could have the same Zip code. Let's concatenate Zip and Country columns to create a unique value field.

18. Select **Cancel** in Create relationship dialog.

We need to create a new column in both the Geography table and the Sales table that combines "Zip" and "Country". Let us start by creating a new column in the Sales table.

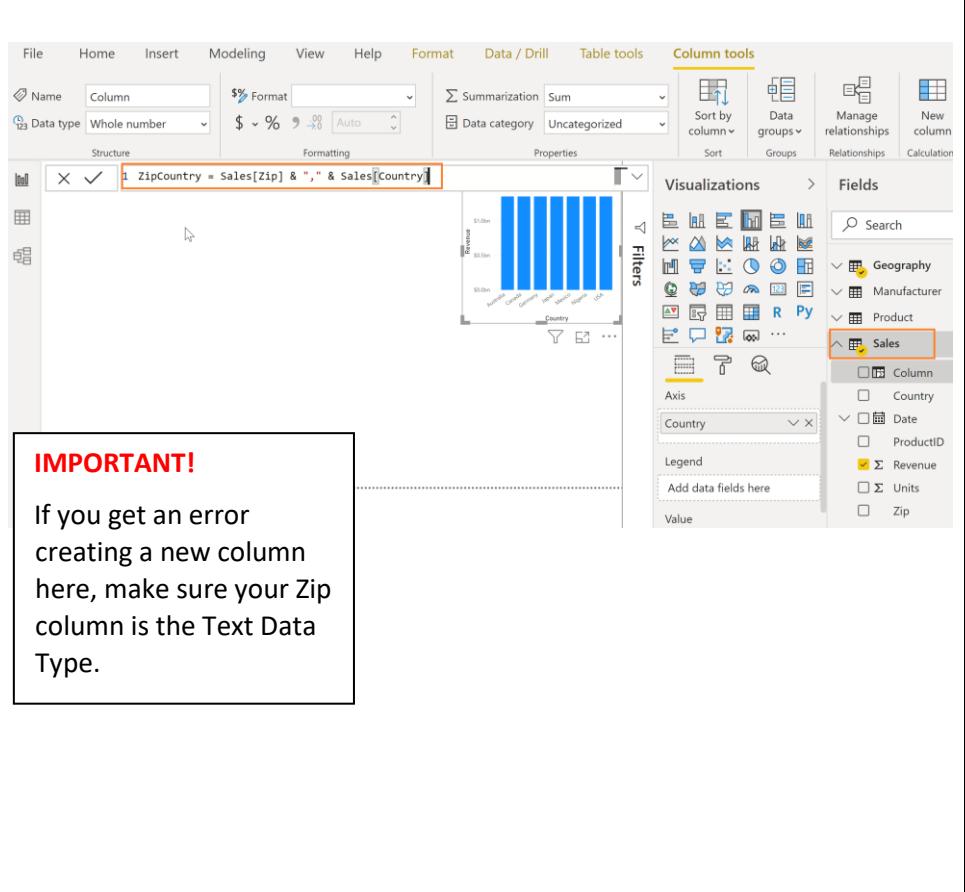
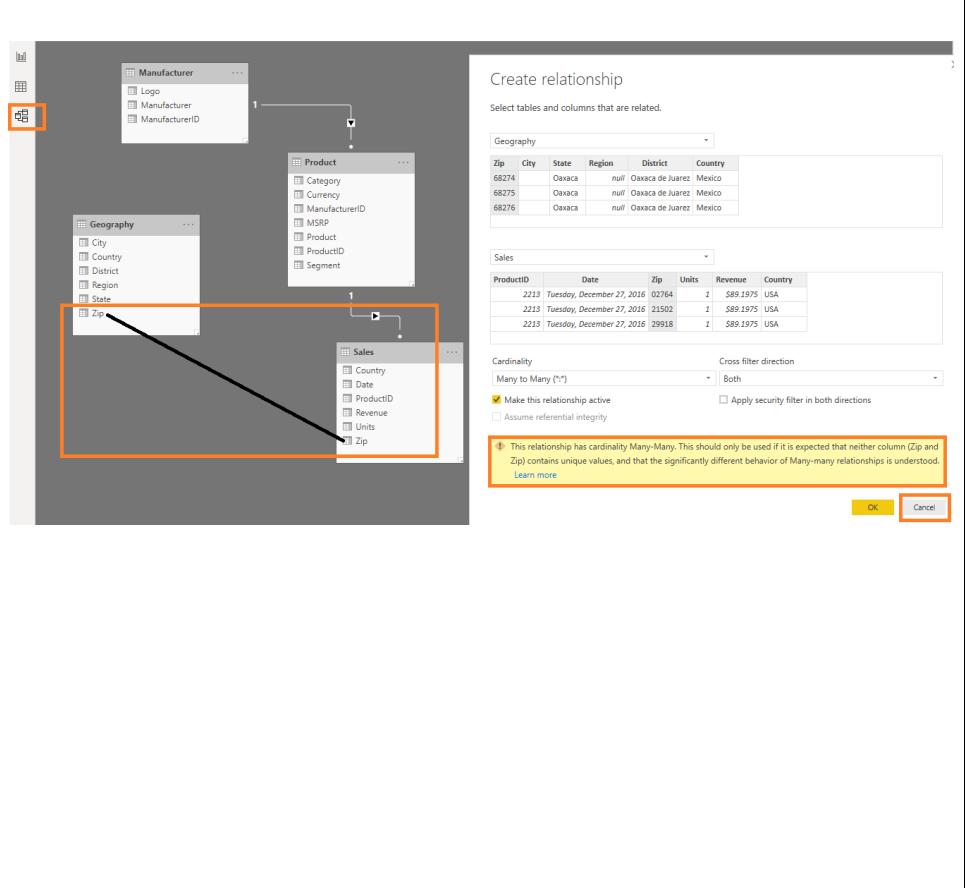
19. Click on the **Report** icon on the left panel to navigate to the Report view.

20. In the **Fields** section, click on the ellipsis next to **Sales** table. Select "**New Column**" as shown in the figure.

You will see a formula bar appear as shown in the screenshot to help create this new column.

21. We can combine or concatenate the Zip and Country columns into a new column called ZipCountry separated by a comma. Let us create this column called **ZipCountry** using the following calculation in the editor.

ZipCountry = Sales[Zip] & "," & Sales[Country]



22. Once you are done entering the formula press Enter or click in the check mark on the left side of the formula bar.

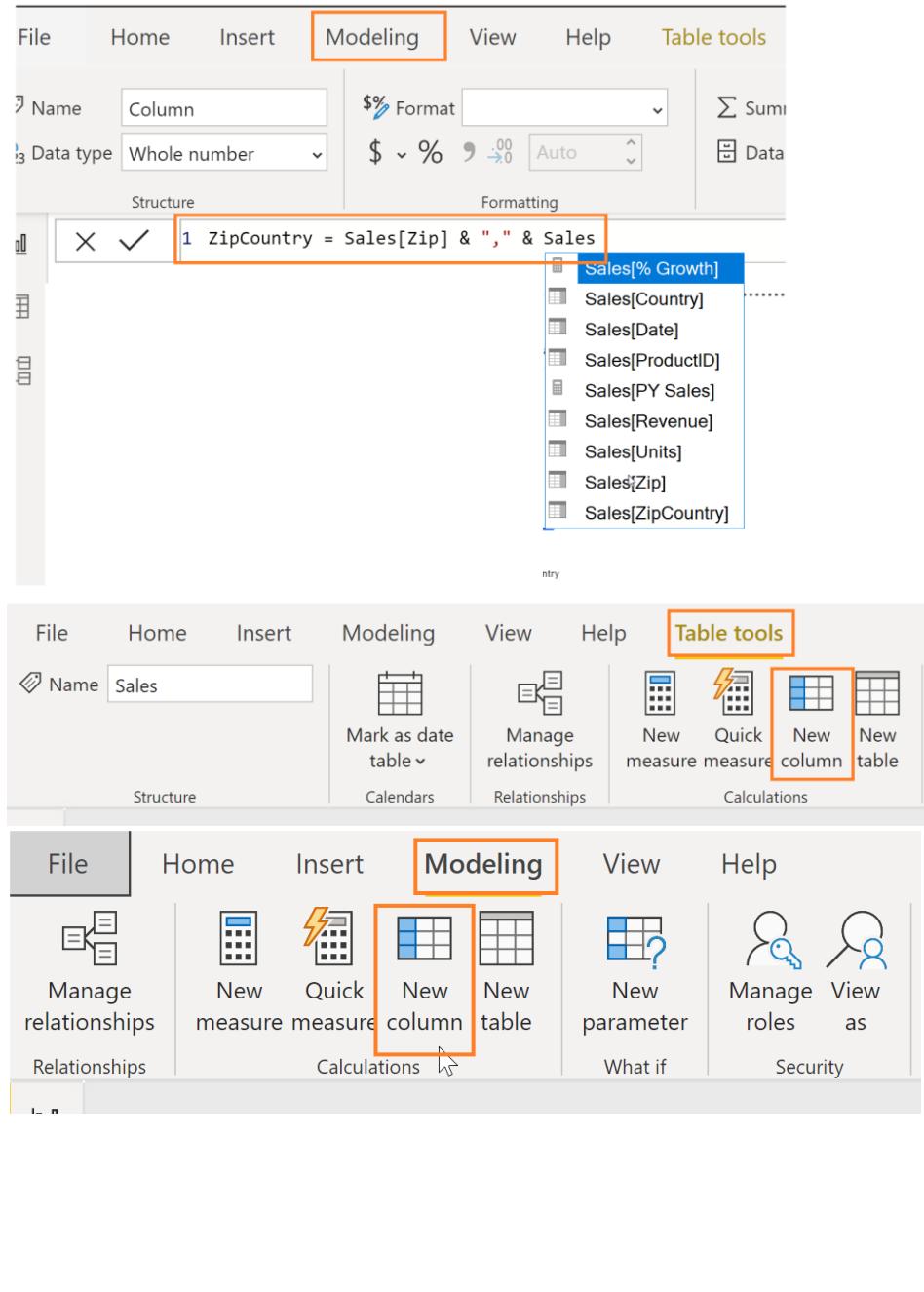
You will notice that IntelliSense appears guiding you to choose the correct column.

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 a (fx), near the new column ZipCountry, indicates you have a column that contains an expression, also referred to as calculated column.

Note: An alternative way to add a new column is by selecting the table and then clicking on **Table Tools -> New Column** or **Modeling -> New Column** from the ribbon.

Let us use this method to create a “ZipCountry” column in the Geography table. – add print screen



23. From **Fields** section, select **Geography** table and from the ribbon select **Modeling** -> **New Column** as shown in the figure.

24. Formula bar appears. Enter the following DAX expression in the formula bar:

**ZipCountry = Geography[Zip]
& "," & Geography[Country]**

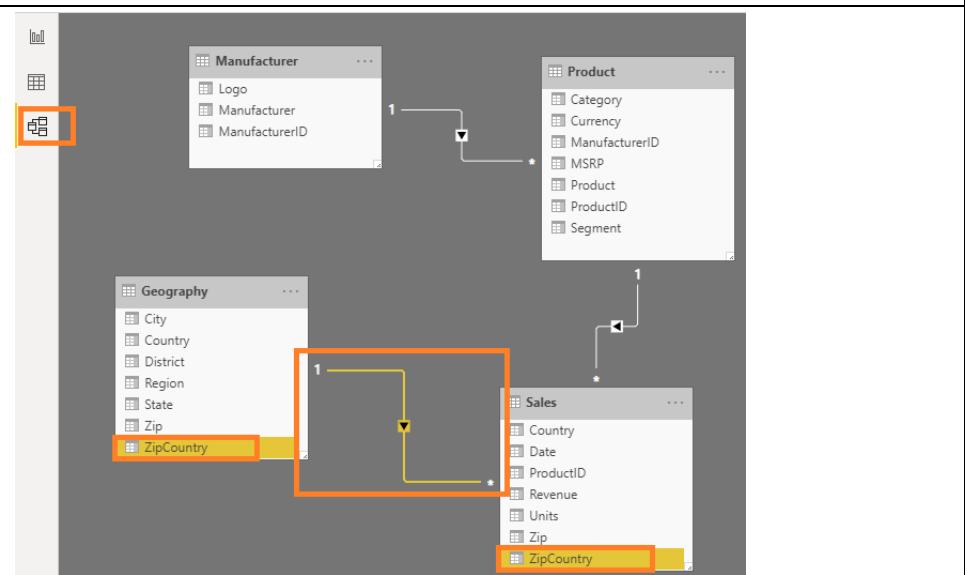
You will see a new column ZipCountry in Geography table. The final step is to setup the relationship between the two tables using the newly created "ZipCountry" columns in each of these tables.

The screenshot shows the Power BI desktop interface. The ribbon is visible at the top with the 'Modeling' tab selected. In the center, there's a formula bar with the text '1 ZipCountry = Geography[Zip] & "-" & Geography[Country]'. To the right of the formula bar, a context menu is open over the 'Geography' table, listing various geographical hierarchy levels: City, Country, District, Region, State, and Zip. The 'Zip' option is highlighted. At the bottom left, there's a preview pane showing the 'Geography' table with its columns: City, Country, District, Region, State, and Zip. The 'ZipCountry' column is highlighted with a yellow box.

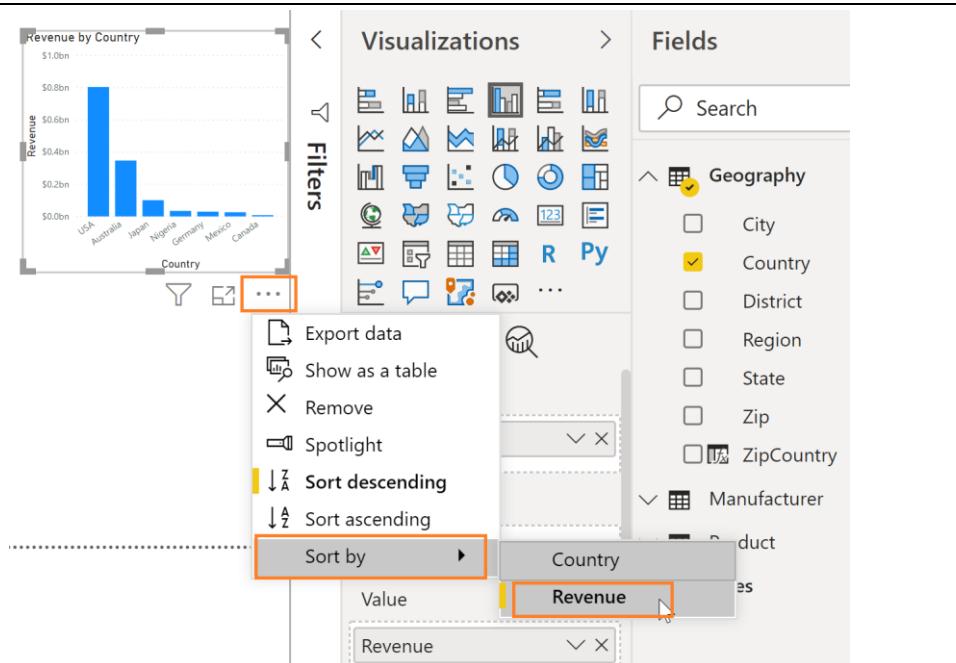
25. Click on the **Model** icon on the left panel to navigate to the Relationship view.

26. Drag **ZipCountry** field from **Sales** table and connect it to **ZipCountry** field in **Geography** table.

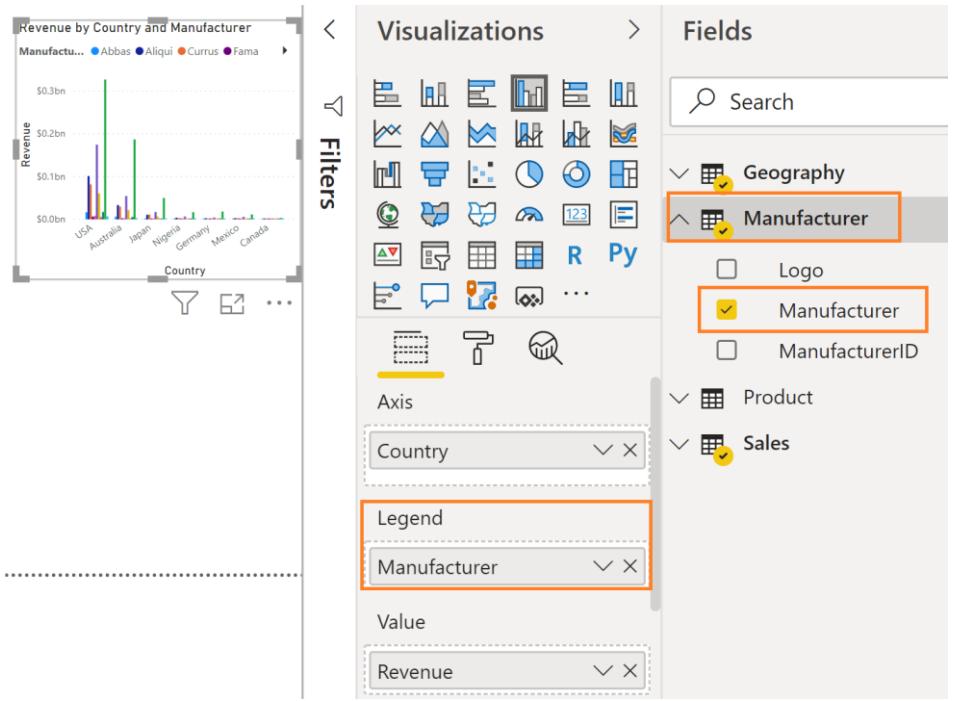
Now we have successfully created a relationship. The number 1 next to Geography indicates it is on the one side of the relationship and * next to Sales indicates it is on the many side of the relationship.



27. Click on the **Report** icon on the left panel to navigate to the Report view. Notice the clustered column chart we created earlier. It shows different sales for each country. USA has the most sales followed by Australia and Japan. By default, it is sorted by Revenue.
28. Click on the **ellipsis** on the top right corner of the visual. (the ellipsis may also show up on the bottom of the chart instead of the top) Notice there is option to Sort by Country as well.



29. From the **FIELDS** section, expand **Manufacturer** table and drag **Manufacturer** column to the **Legend** section under **Visualizations**.

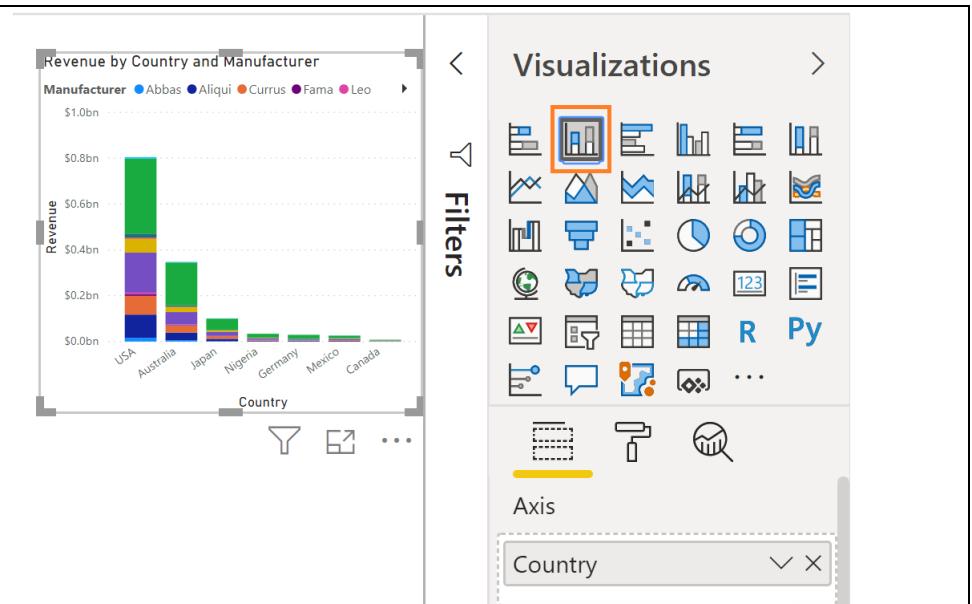


30. While you have your chart selected, select the Clustered column chart from the **VISUALIZATIONS** section select **Stacked column chart** visual.

31. Resize the visual as needed.

Now we can see top manufacturers by country.

Try different visuals to see which chart explores the data the best.



32. With **Stacked column chart** selected

33. In the Filters pane, expand **Manufacturer**.

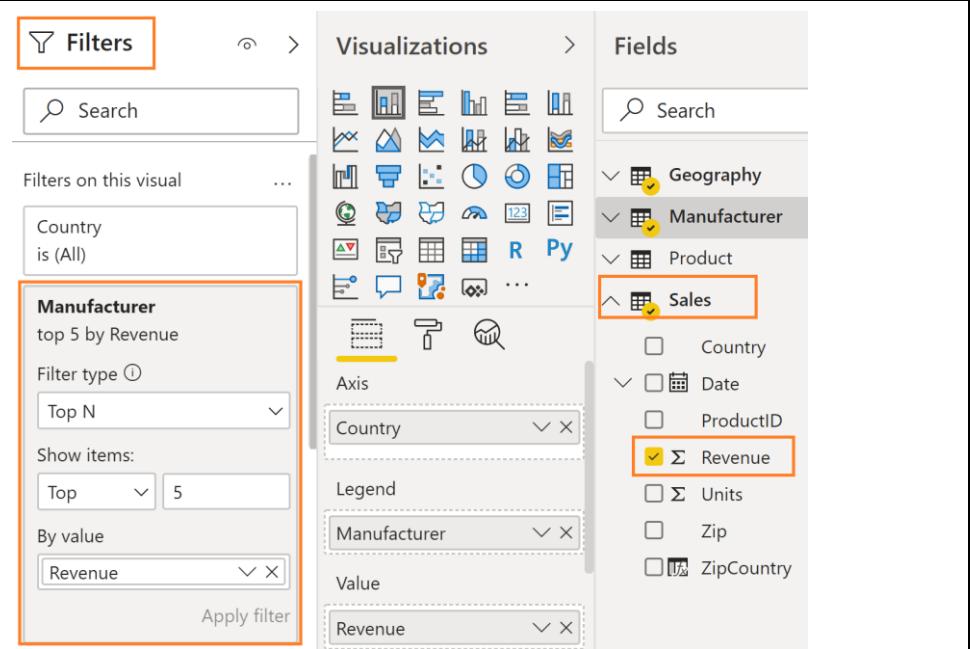
34. From the **Filter Type** drop down select **Top N**.

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

36. From **Sales** table, drag and drop **Revenue** field to **By value** section.

37. Select **Apply filter**.

Notice now the visual is filtered to display the Top 5 manufacturers by Revenue. We see that VanArsdel has higher percentage of sales in Australia compared to other countries.

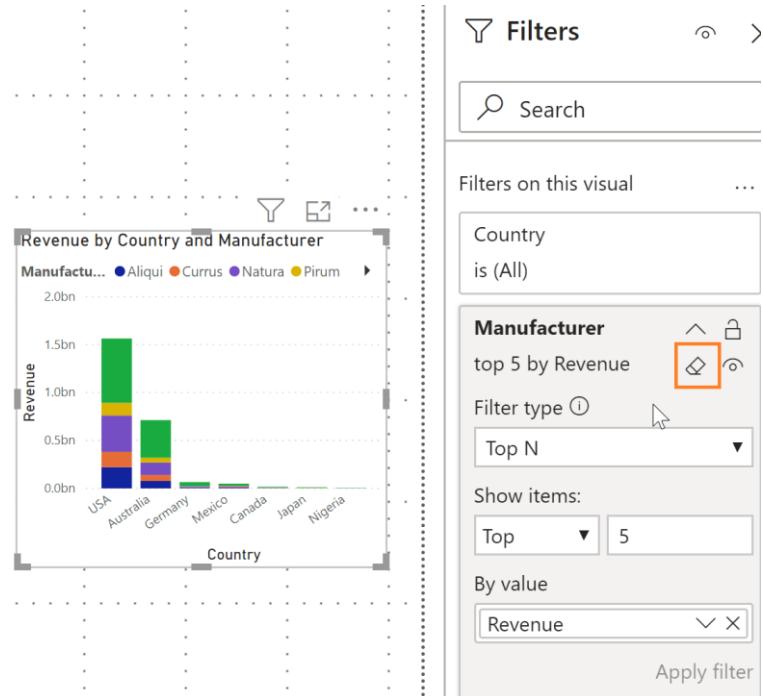


We are interested in the top 5 competitors by revenue. Let's group them so we don't have to add a filter in every visual.

Before we do that let's remove the Top 5 visual level filter.

38. With **Clustered column chart** selected

39. Hover over and select the **Clear filter** icon (erase) next to Manufacturer field in the Filters Pane.



40. From the **FIELDS** section, right click on the **Manufacturer** field name (note: do not check the checkbox) from **Manufacturer** table.

41. Click **New Group**

42. In the Ungrouped values section, using Ctrl key, select **Aliqui**, **Currus**, **Natura** and **Pirum**.

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

44. Double click the newly created group and **rename it to Top Competitors**.

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

46. Select the check box **Include Other group**. This will create another Other group which will include all the other manufacturers.

47. Select **OK** to close Groups dialog.

Groups

Name	Field
Manufacturer (groups)	Manufacturer

Group type: List

Ungrouped values:

- Abbas
- Barba
- Fama
- Leo
- Palma
- Pomum
- Quibus
- Salvus
- Victoria

Groups and members:

- Top Competitors
 - Aliqui
 - Currus
 - Natura
 - Pirum
 - VanArsdel
 - Other
 - Contains all ungrouped values

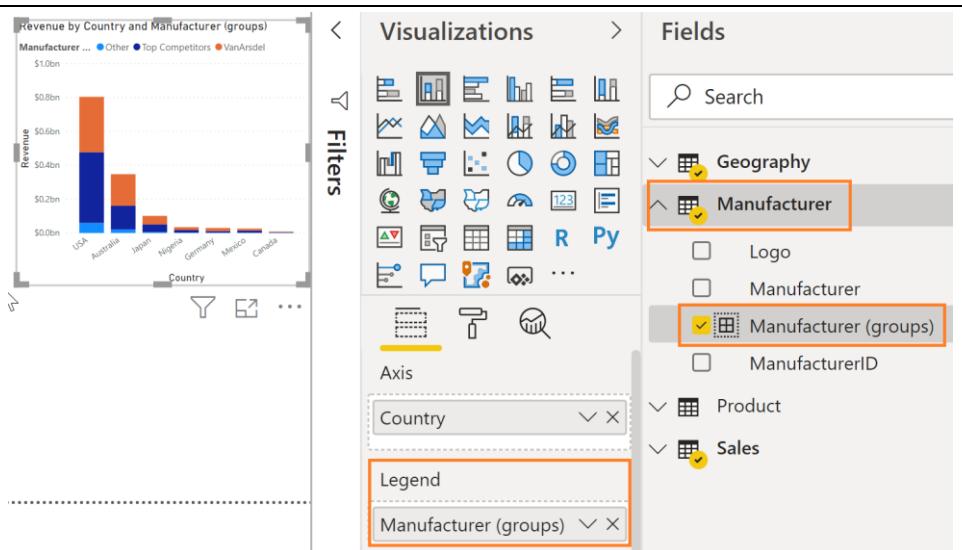
Include Other group

Group Ungroup OK Cancel

48. With the **Stacked column chart** selected, click on the X next to **Manufacturer** in the **Legend** section. This will remove Manufacturer.

49. From the **FIELDS** section, drag the newly created **Manufacturer (groups)** to the Legend section.

Now we can clearly see that VanArsdel has nearly 50% share in Australia.



50. Hover over one of the columns and right click.

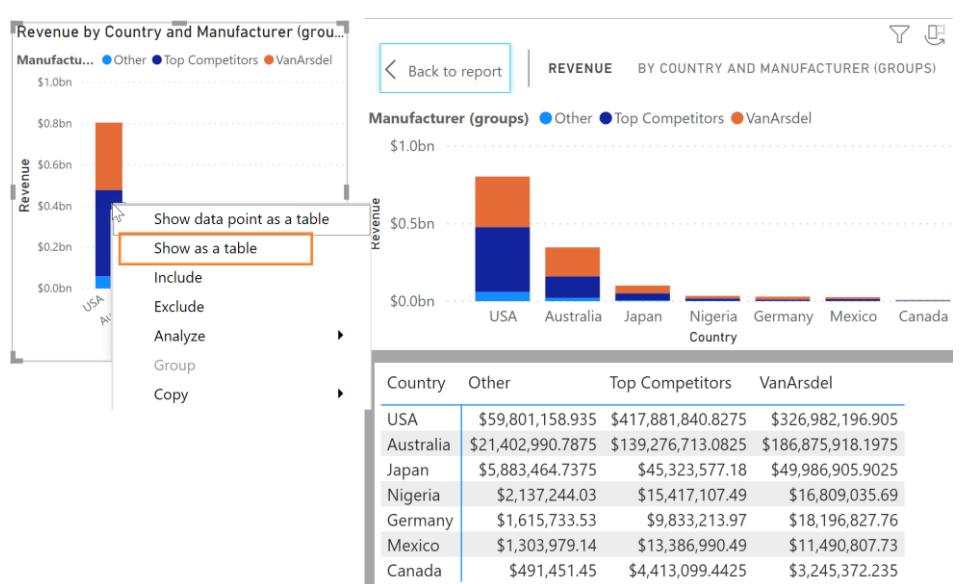
51. Select **Show as a table**.

You will be in Focus mode with the chart displayed on top and the data displayed below. VanArsdel has a big percent of the Australian market.

52. Use the icon on the top right corner to switch to **vertical layout**. In this layout you will view the chart on the left and data on the right panel.

53. Select **Back to Report** to go back to Report canvas.

Note: You can use similar steps to **Show data point as a table** to see records for a particular data point



Let's create Revenue by Manufacturer visual.

54. Click on the white space in the canvas. From the **FIELDS** section, click the **checkbox** next to **Revenue** field in **Sales** table.

55. From the **FIELDS** section, click the **checkbox** next to **Manufacturer** field in **Manufacturer** table.

56. From the **VISUALIZATIONS** section, select **Treemap** visual.

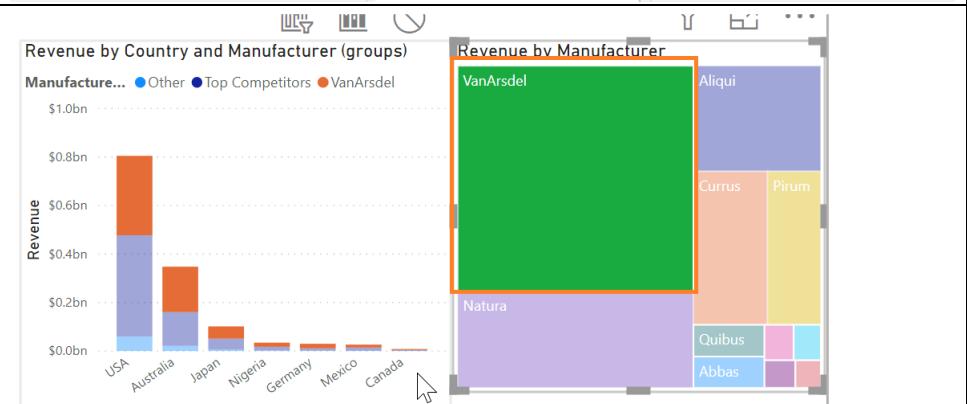
We have Revenue by Manufacturer.

Let's figure out the interaction between the Stacked column chart and the Treemap visuals.

57. Select **VanArsdel** in the **Treemap** and notice Stacked column chart is filtered. This confirms that VanArsdel has a big percent of the Australian market.

58. To **remove the filter** select VanArsdel again.

The interaction between visuals is called **cross filtering**.



Previously we added Top 5 Visual level filter. Let's add a filter to the Page level, so we are working with the Top Competitors and VanArsdel and filter out the other manufacturers.

Page level filters apply to all the visuals on the page whereas Visual level filter applies to a visual. Ensure the Filters pane is expanded/open

59. From **FIELDS** section, drag **Manufacturer (groups)** from **Manufacturer** table to the **Filters on this page** box in the **Filters Pane**

60. Select **Top Competitors** and **VanArsdel**.

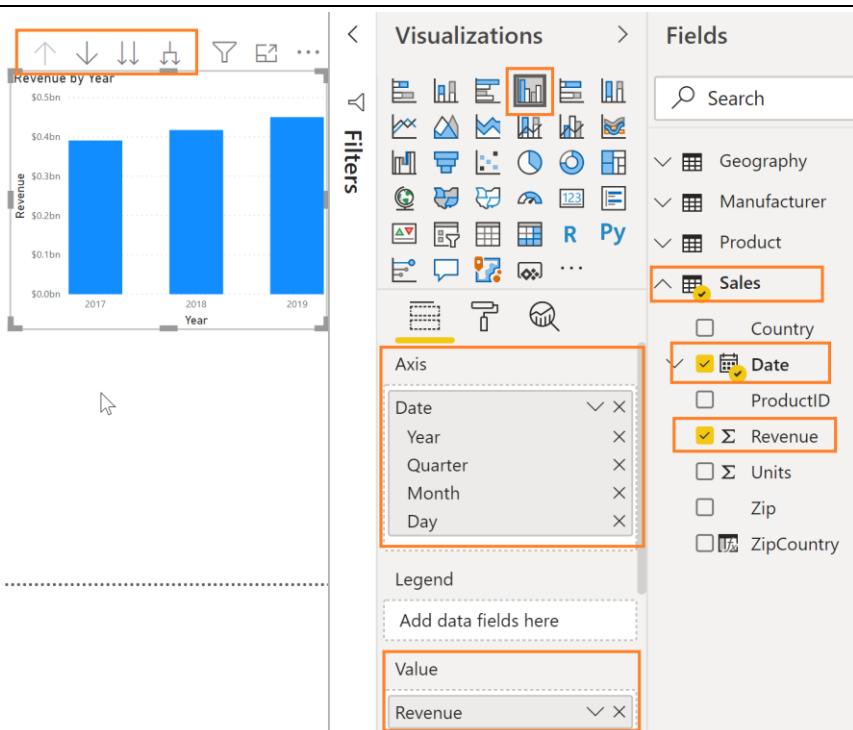
Let's add a visual that will provide sales information over time.

61. Click on the white space in the canvas.

62. Click the checkbox next to the **Date** field in **Sales** table. Notice a Date Hierarchy is created.

63. Click the checkbox next to the **Revenue** in **Sales** table field.

Notice a Clustered column chart is created. Also notice in the **Axis** section, a date hierarchy is created. There are arrows on the top bar of the chart. This is used to navigate through the hierarchy.



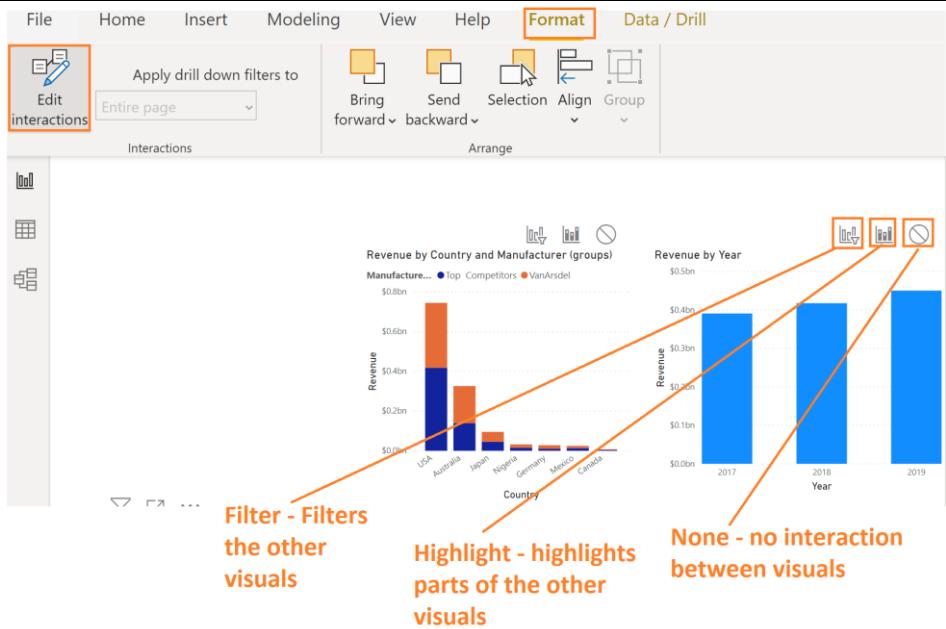
64. Click on **Australia** column in the **Revenue by Country** visual.

65. With the Revenue by Country visual selected, from the ribbon select **Format -> Edit Interactions**.

Notice on the top right of the other two visuals we see new icons with the highlight icon selected.

66. Select **filter icon** for **both** visuals.

Notice now in both Revenue by Year and Revenue by Manufacturer data is filtered for Australia.



67. Now select **Revenue by Year** visual.
68. Select **filter icon** on the other **two visuals**.

69. Similarly, select **Revenue by Manufacturer** visual and select **filter icon** on the other **two visuals**.

Once you are done, all the visuals should be in filter mode.

70. With the **Revenue by Manufacturer** visual selected, from the ribbon select **Format -> Edit Interactions** to remove the icons.

Note: If your screen doesn't look similar please edit interactions

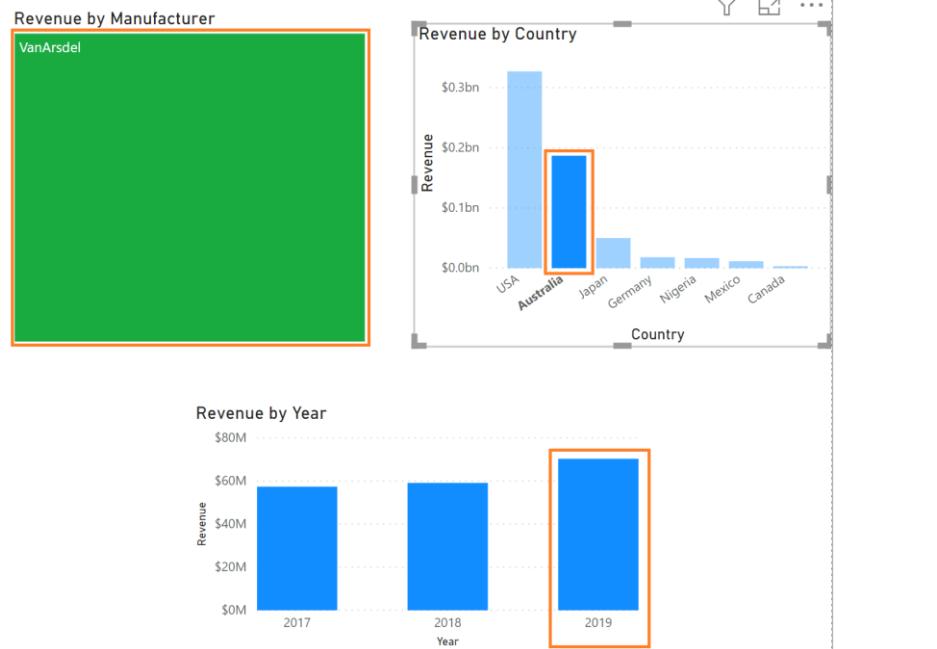


We had already noticed that VanArsdel has a big share of the market in Australia. Let's check how VanArsdel has done over time in Australia.

71. Click on the **Revenue by Country** chart, remove **Manufacturer (groups)** from the legend

72. Click on **VanArsdel** in the **Revenue by Manufacturer** visual.

73. **Ctrl+Click Australia column in Revenue by Country** visual. Now we have filtered the charts by both VanArsdel and Australia. We see a spike in 2019 sales for VanArsdel in Australia.



We are intrigued by the spike in 2019 for VanArsdel in Australia. Let's investigate further.

74. Click on **VanArsdel** in the **Revenue by Manufacturer** visual.

75. Ctrl+Click **Australia** column in **Revenue by Country** visual

76. Select the **down arrow** on the **top right** corner of the **Revenue by Year** visual. This enables drill down capability.

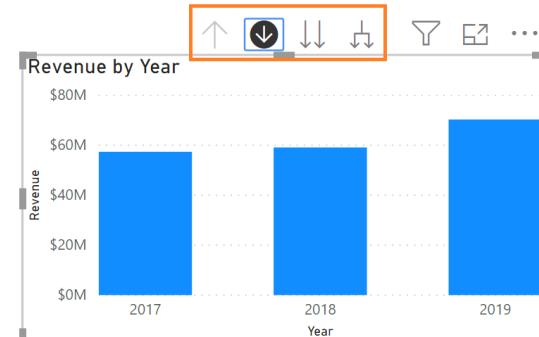
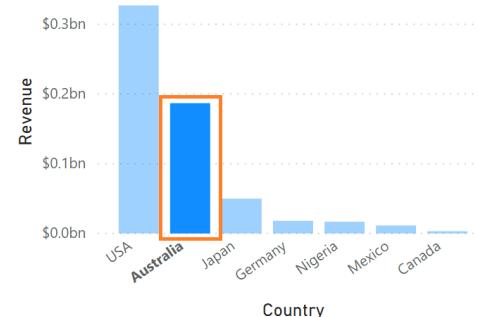
77. Select **2019** column in **Revenue by Year** visual.

Notice you have drilled down to quarter level of 2019. There is a big spike in the 4th quarter. Interesting let's dig further...

Revenue by Manufacturer

VanArsdel

Revenue by Country

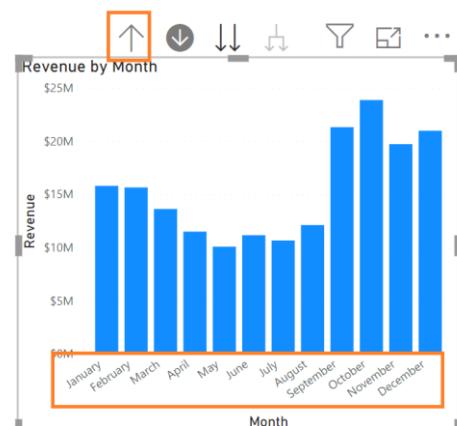
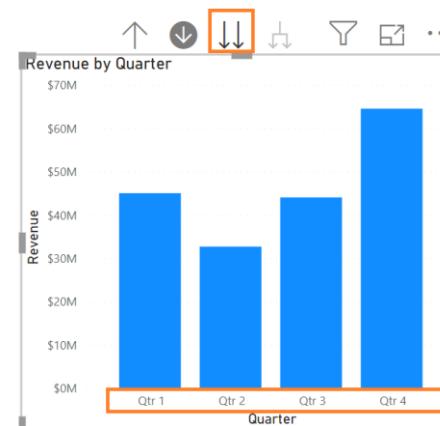


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78. Click on the **double arrow icon** on the **top right** of **Revenue by Year** visual. This drills down to the **next level of the hierarchy** which is month.

79. Click on the **up arrow icon** on the **top right** of **Revenue by Year** visual to drill up to **Quarter** level.

80. Click on the **drill up icon** again to go up to **Year** level.

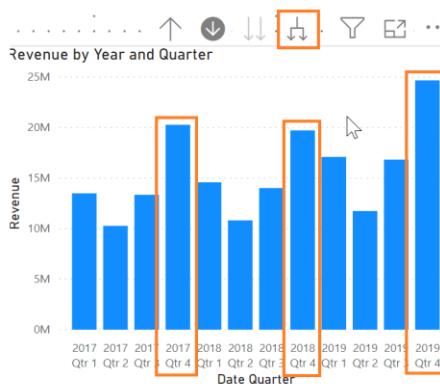


81. Click on the **split arrow icon** on the **top right** of **Revenue by Year** visual.

This expands down to the **next level of the hierarchy** which is quarter for all the years.

Notice 4th quarter sales have always been high but in 2019 there is a bigger spike in the 4th quarter.

82. Let's expand down to the month level. Click on the **split arrow icon** on the **top right** of **Revenue by Year** visual. This expands down to the **next level of the hierarchy** which is month for all the years.



There is a lot of information on the visual and we must scroll left and right to compare.

Power BI Desktop – Data Exploration Continued

Let's add a slicer so we can filter manufacturers.

83. Click on the white space in the canvas. From the **FIELDS** section, click the checkbox next to **Manufacturer** field in **Manufacturer** table.

84. From the **VISUALIZATIONS** section select **Slicer** visual.

85. You will see a list of Manufacturers.

Select **VanArsdel** and notice all the visuals are filtered based on your selection.

86. Hover over the top right corner of the visual and click on the **down arrow**.

Notice you have the option to change the slicer from a list to a drop down.

87. Select **Dropdown**.

88. Select **VanArsdel** from the dropdown.

89. Confirm **Top Competitors** and **VanArsdel** are selected in the **Manufacturer (groups)** filter in the Filters pane

Note that there is a box for **Filters on all pages** in the Filters pane. If you have duplicate pages this is how you sync a filter for the whole document

Use Manufacturer slicer to analyze one manufacturer at a time

90. Select Revenue by Manufacturer

Treemap visual.

91. From the **VISUALIZATIONS** section, select **Card** visual.

The card visual will give us the Revenue as we filter and cross filter the visuals.

A screenshot of the Power BI interface. On the left, there is a 'Manufacturer' slicer with 'VanArtsdel' selected. In the center, a large orange-bordered card displays the revenue '\$613.59M' under the category 'Revenue'. To the right, the 'Visualizations' pane is open, showing various chart and card icons. The 'Card' icon is highlighted with a red box. Below the pane, a 'Fields' section shows a dropdown for 'Revenue' and a 'Drill through' button.

Notice all key dimensions is in its own table with the related attributes **except date**. E.g. Product attributes are in Product table. Let's create Date table.

92. Navigate to Data view by clicking on the **Data** icon on the left panel.

93. From the ribbon select **Table Tools -> New Table**.

Notice a new table is created in the FIELDS section on the right and formula bar opens.

94. Enter **Date =CALENDAR
(DATE(2012,1,1), DATE(2019,12,31))** in the formula bar and click on the **check mark**. A Date table with a Date column is created.

We are using 2 DAX functions: **CALENDAR** function which takes the start and end data. **DATE** function which takes year, month and date fields.

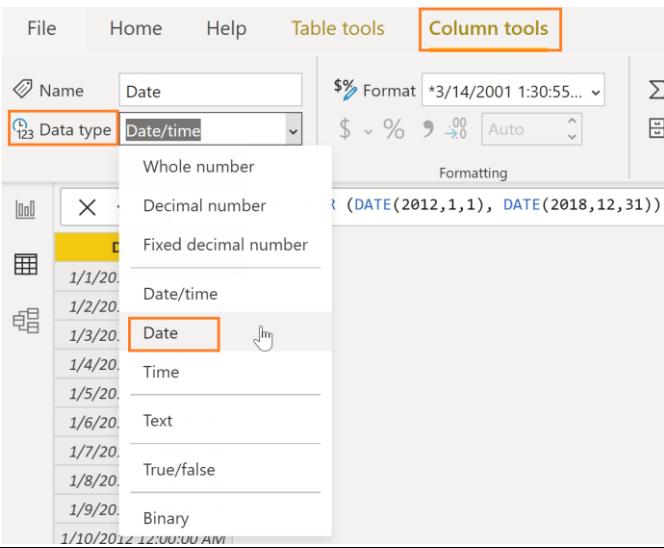
We are creating Date from 2012 to 2019 since our dataset has data for those years.

We can add more fields to this table like Year, Month, Week etc. by using DAX functions.

A screenshot of the Microsoft Excel ribbon. The 'Table tools' tab is highlighted with a red box. In the formula bar, the code 'Date = CALENDAR(DATE(2012,1,1), DATE(2019,12,31))' is entered. The 'Structure' group on the ribbon shows options for 'Mark as date table', 'Calendars', 'Relationships', and 'Calculations'. The formula bar also shows a checkmark and the number '1'.

Notice Date field is of type Date/Time.
Let's change it to data type Date.

95. Select the **Date** field in the **Date** table.
96. From the ribbon, select **Column Tools**
-> **Data type -> Date**.



Next, we need to create a relationship between the newly created Date table and Sales table.

97. From the ribbon, select **Column Tools**
-> **Manage Relationships**.

98. Manage Relationships dialog opens.
Select **New** button.

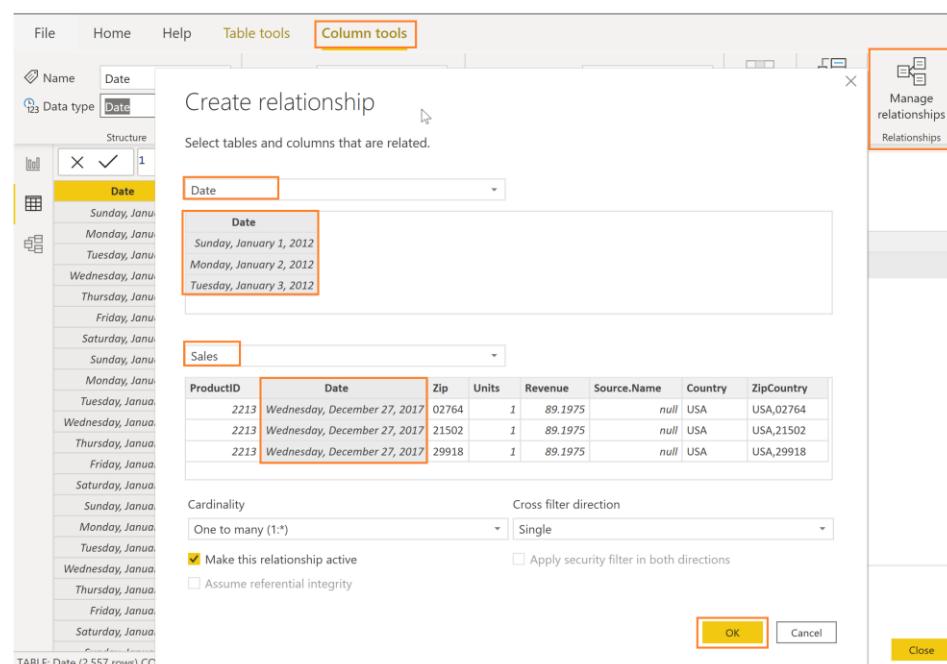
99. Create relationship dialog opens.
Select **Date** from the top dropdown.

100. Select **Sales** from the second dropdown.

101. Highlight **Date** fields from both the tables.

102. Select **OK** to close Create relationship dialog.

103. Select **Close** to close Manage relationships dialog.



104. Navigate to Report view by clicking on the **Report** icon on the left panel.
Notice Revenue by Date chart looks different. Let's fix it.

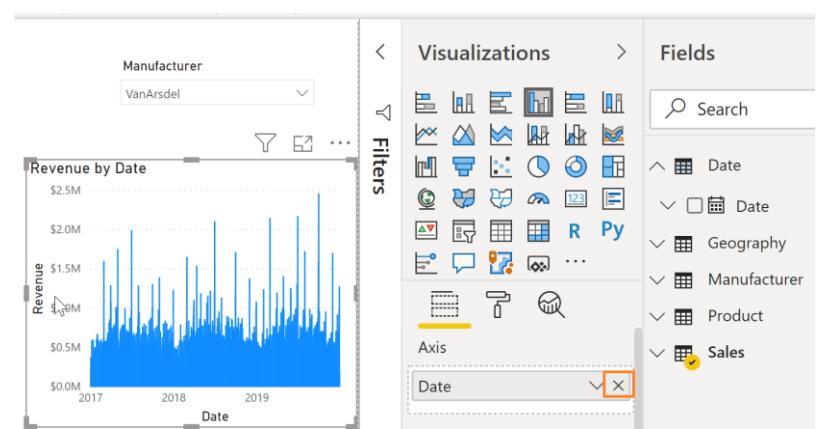
105. Select **Revenue by Date** visual.

106. From the **Axis** click on "X" to remove the **Date** field.

107. From the **FIELDS** section expand **Date** table.

108. Drag **Date** field to **Axis** section.

Notice with the new Date field behavior is like earlier.

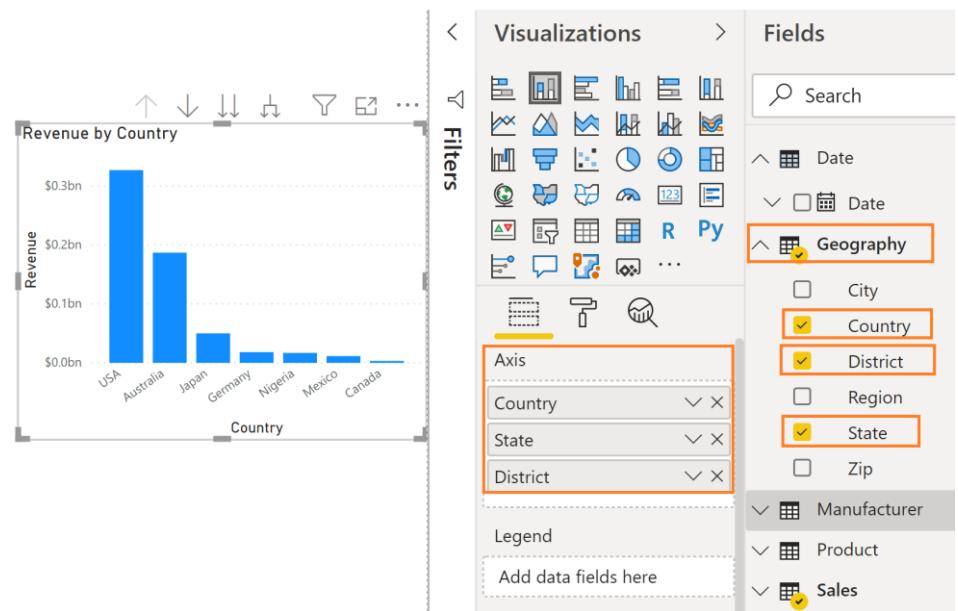


	<p>The screenshot shows a bar chart titled "Revenue by Year" with three blue bars representing the years 2017, 2018, and 2019. The Y-axis is labeled "Revenue" and ranges from \$0M to \$250M. The X-axis is labeled "Year". Above the chart, a dropdown menu for "Manufacturer" is open, showing "VanArdel". To the right of the chart are sections for "Visualizations" and "Fields". The "Fields" section is expanded, showing a tree view of data sources: Date, Geography, Manufacturer, Product, and Sales. The "Date" node under Sales is selected and highlighted with an orange border. Below the tree view is a table titled "Axis" with columns for "Field" and "Type". The "Date" field is listed under "Type" as "X".</p>
<p>There are two Date fields, it might get confusing to figure out which to use. Let's hide the Date field in Sales table.</p> <p>109. From the FIELDS section, Click on the ellipsis next to Date field in Sales table.</p> <p>110. Select Hide. This hides Date field in the reports view. We have the option to view hidden fields and unhide fields as needed.</p> <p>111. Similarly hide Country, ProductID, Zip and ZipCountry in Sales as well</p>	<p>The screenshot shows the "Fields" pane for the "Sales" table. The "Date" field is selected and a context menu is open. The "Hide" option is highlighted with an orange border. Other options in the menu include "Check", "New hierarchy", "New measure", "New column", "New quick measure", "Rename", "Delete", "View hidden", and "Unhide all".</p>
<p>112. Similarly hide ZipCountry from the Geography table.</p> <p>113. Hide ManufacturerID from Manufacturer table.</p> <p>114. Hide ProductID and ManufacturerID from Product table.</p> <p>115.</p> <p>Note: It is best practice to hide fields that are not used in reports.</p>	<p>The screenshot shows the "Fields" pane for the "Geography" table. The "ZipCountry" field is selected and a context menu is open. The "Hide" option is highlighted with an orange border. Other options in the menu include "Check", "New hierarchy", "New measure", "New column", "New quick measure", "Rename", "Delete", "View hidden", and "Unhide all".</p>

Let's get back to our data story, Australia, VanArsdel and 2019 – remember ? Let's check if the spike occurred in a specific region in Australia.

116. Select **Revenue by Country** visual.
117. From the **FIELDS** section, drag **State** field from **Geography** table, below **Country** in the **Axis** section.
118. Drag **District** field below **State** in the **Axis** section.

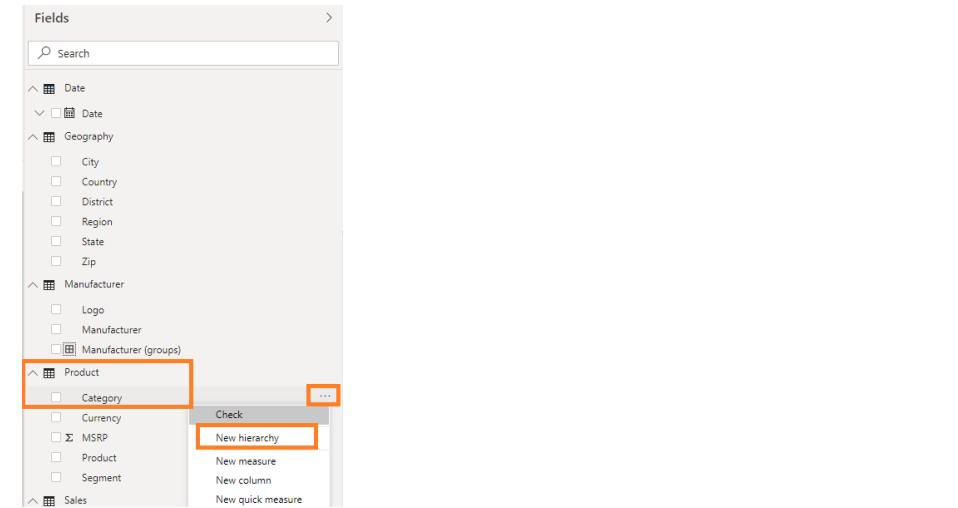
We just created a hierarchy.



119. Make sure **VanArsdel** is selected in the **Manufacturer** slicer.
120. **Enable Drill mode** by selecting down arrow on the top right corner of **Revenue by Country** visual.
121. Select **Australia** to drill down to **State level**.
122. From **Revenue by Year** visual select **2019** and notice Revenue by Country and State visual.
123. **Drill up to country level**.
124. **Disable drill mode** by selecting the down arrow again



- Let's analyze the data by product starting by creating a product hierarchy
125. From the **FIELDS** section, click on the ellipsis next to **Category** in **Product** table.
 126. Select **New Hierarchy**.



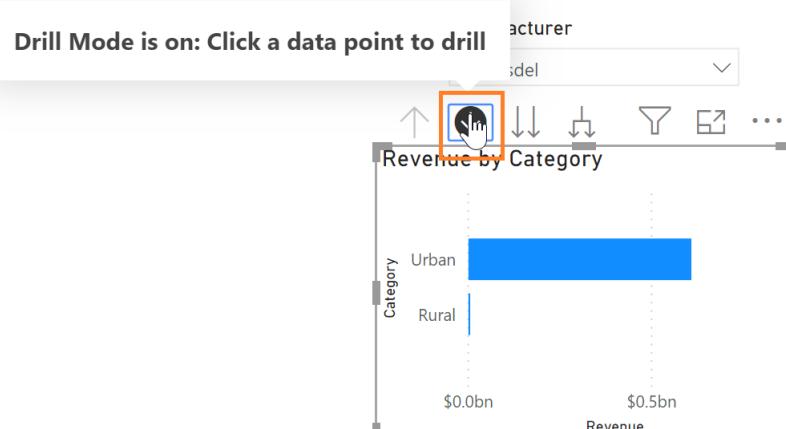
Notice a new field called Category Hierarchy is created in the Product table.
127. Double click on Category Hierarchy and rename it to Product Hierarchy.

128. Click on the ellipsis next to Segment.
129. Select Add to Hierarchy -> Product Hierarchy.
130. Click on the ellipsis next to Product.
131. Select Add to Hierarchy -> Product Hierarchy.

We have created a Product Hierarchy which is Category -> Segment -> Product.

132. Click on the white space in the canvas. From the VISUALIZATIONS section select Clustered bar chart.
133. From the FIELDS section, expand Product table.
134. Click the checkbox next to Product Hierarchy. Notice complete hierarchy is selected.
135. From the FIELDS section, expand Sales table.
136. Click the checkbox next to Revenue field.

137. Enable drill down mode in the **Revenue by Category** chart by clicking on the down arrow
138. Click on **Urban**



139. In **Revenue by Country** visual select **Australia**.
140. **Ctrl+Click 2019** from Revenue by Year visual. Notice sales in Extreme category is higher than Convenience and Moderation segments.
We need to investigate further...



141. Select the **down arrow** on the top of **Revenue by Country** visual to enable drill model.

142. Select **Australia** to **drill down** to **State** level.

143. Select **2018** in Revenue by Year visual.

144. **Remove drill mode** from Revenue by Category visual.

145. **Ctrl+Click Extreme** Segment in Revenue by Category and Segment visual.

146. Select **2019** in Revenue by Year visual.

147. **Ctrl+Click Extreme** Segment in Revenue by Category and Segment visual.

There is no significant spike by State.

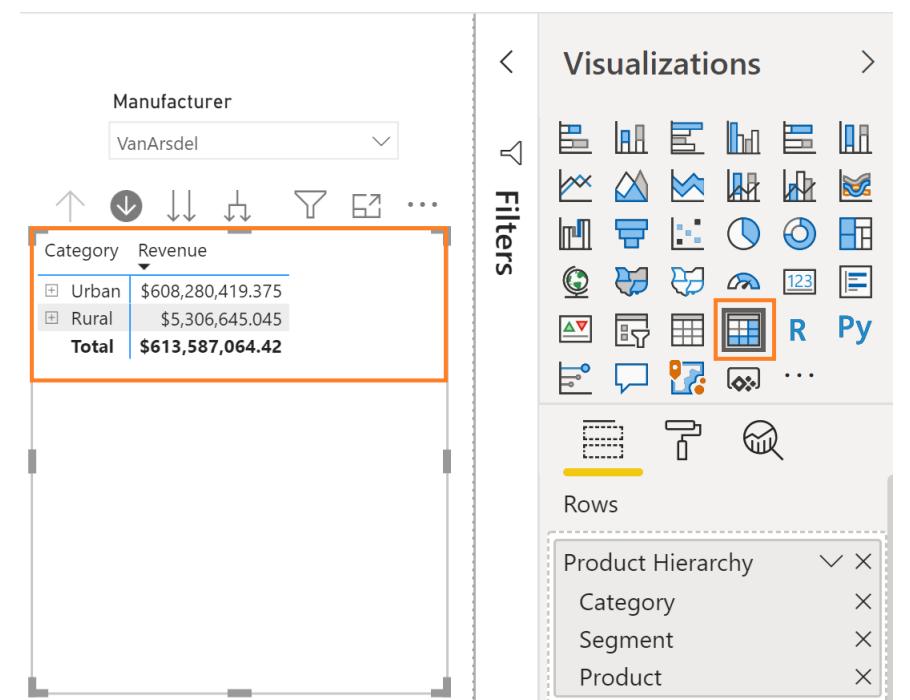
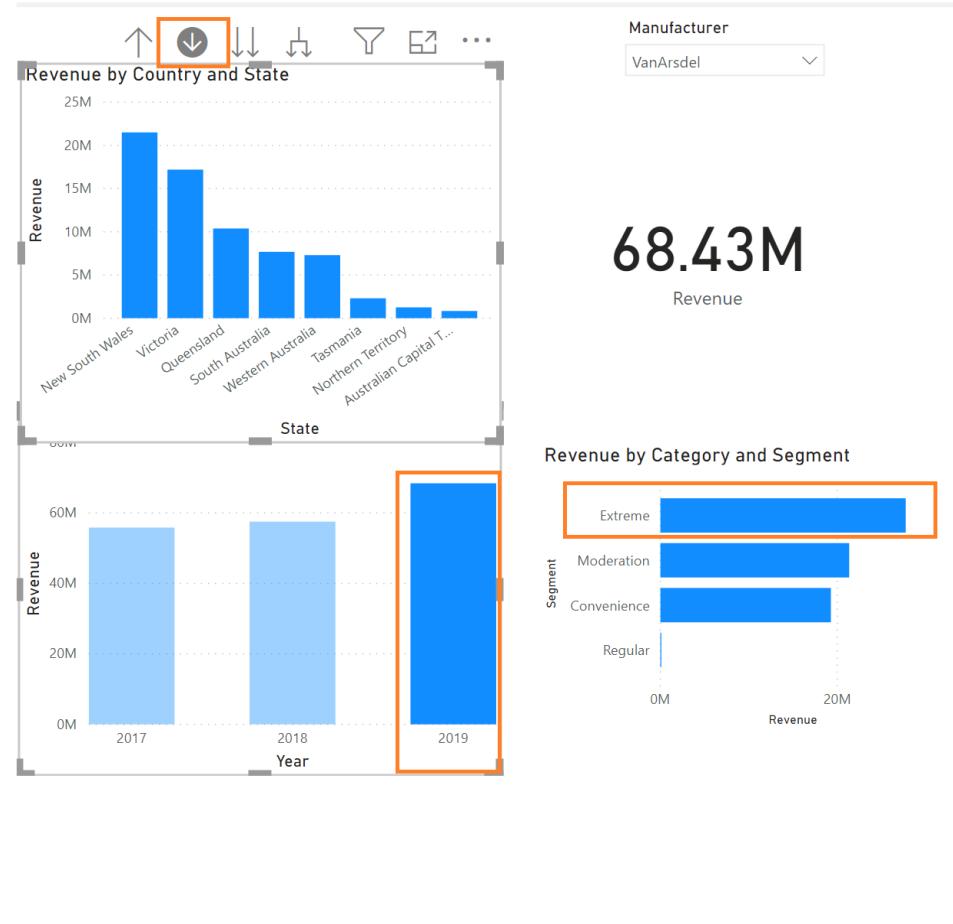
148. Select **Extreme** again to remove cross filtering between visuals.

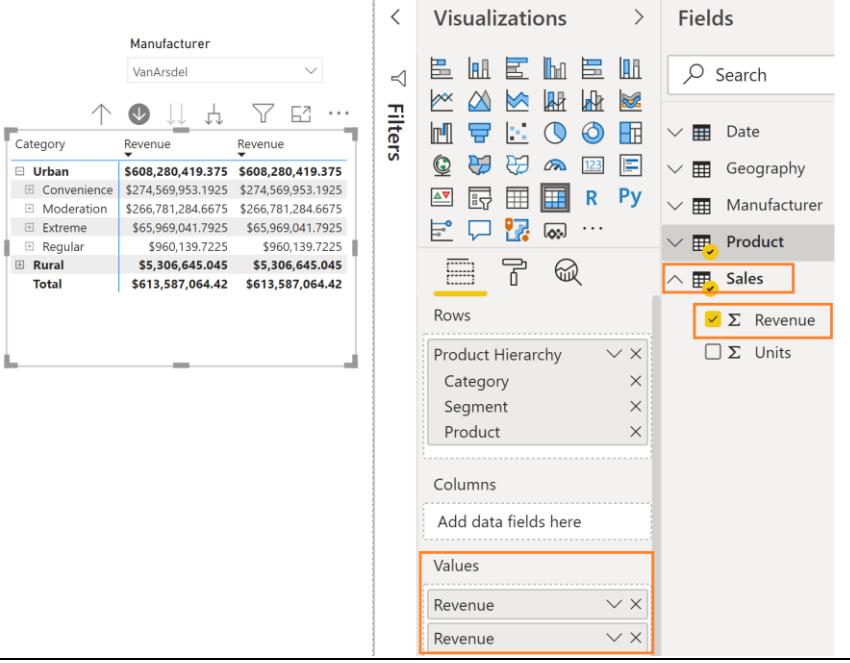
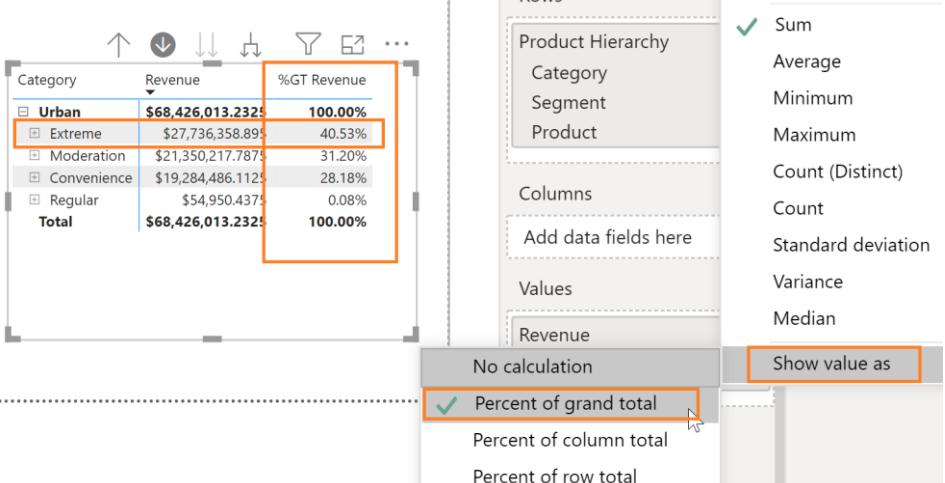
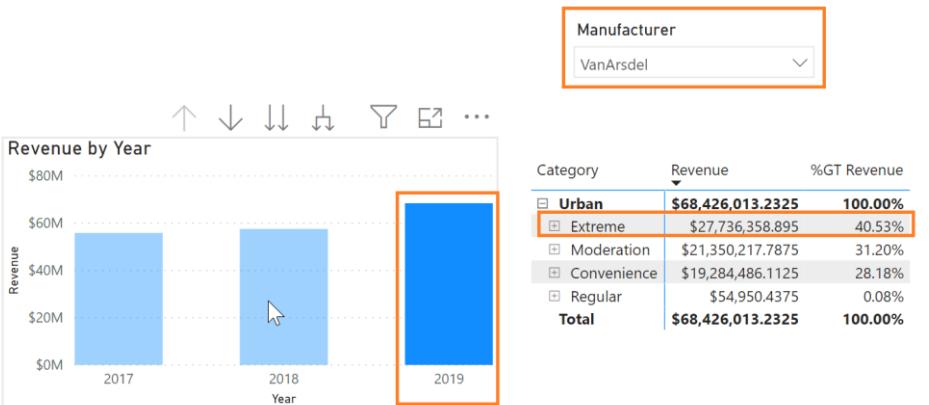
149. **Drill up to Category level** in Revenue by Category visual.

150. **Disable drill mode** by selecting the down arrow again

Let's add a Matrix visual so we can view data in rows and columns. We can apply conditional formatting to the matrix visual to highlight outliers.

151. Click on the **Revenue by Category** clustered bar chart and change it to a **Matrix** visual.



<p>152. Select + next to Urban row to drill down.</p>																						
<p>Let's add percent of total field. This will give us a better perspective.</p> <p>153. Navigate away from Format section to the Fields pane.</p> <p>154. From FIELDS section drag Revenue field from Sales table below the existing Revenue field in Values section.</p> <p>155. Select the arrow next to the newly added Revenue field.</p>																						
<p>156. From the menu select Show value as -> Percent of grand total.</p> <p>157. Make sure you have Australia and 2019 selected on the other charts</p> <p>Let's look at the Extreme category for Australia over time.</p>																						
<p>158. In the Revenue by Year visual select 2017 column. Notice Extreme segment has around 30% of the grand total.</p> <p>159. In the Revenue by Year visual select 2018 column. Notice Extreme segment has around 30% of the grand total.</p> <p>160. In the Revenue by Year visual select 2019 column. Notice Extreme segment has around 40% of the grand total.</p> <p>161. In the Revenue by Year visual select 2019 column to remove the filter.</p>	 <table border="1"> <thead> <tr> <th>Category</th> <th>Revenue</th> <th>%GT Revenue</th> </tr> </thead> <tbody> <tr> <td>Urban</td> <td>\$68,426,013.2325</td> <td>100.00%</td> </tr> <tr> <td>Extreme</td> <td>\$27,736,358.895</td> <td>40.53%</td> </tr> <tr> <td>Moderation</td> <td>\$21,350,217.7875</td> <td>31.20%</td> </tr> <tr> <td>Convenience</td> <td>\$19,284,486.1125</td> <td>28.18%</td> </tr> <tr> <td>Regular</td> <td>\$54,950.4375</td> <td>0.08%</td> </tr> <tr> <td>Total</td> <td>\$68,426,013.2325</td> <td>100.00%</td> </tr> </tbody> </table>	Category	Revenue	%GT Revenue	Urban	\$68,426,013.2325	100.00%	Extreme	\$27,736,358.895	40.53%	Moderation	\$21,350,217.7875	31.20%	Convenience	\$19,284,486.1125	28.18%	Regular	\$54,950.4375	0.08%	Total	\$68,426,013.2325	100.00%
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<p>Let's drill down Extreme Segment and figure out if a Product stands out.</p> <p>162. In the matrix visual select Extreme row to drill down to Product level.</p> <p>163. Resize the visual as needed.</p> <p>164. Hover over matrix visual and select the ellipsis on the top right corner.</p> <p>165. Select Sort By %GT Revenue and Sort Descending.</p> <p>We see the top Products.</p>	<table border="1"> <thead> <tr> <th>Category</th> <th>Revenue</th> <th>%GT Revenue</th> </tr> </thead> <tbody> <tr> <td>Urban</td> <td>\$27,736,358.895</td> <td>100.00%</td> </tr> <tr> <td>Extreme</td> <td>\$27,736,358.895</td> <td>100.00%</td> </tr> <tr> <td>Maximus UE-04</td> <td>\$1,853,290.0575</td> <td>6.68%</td> </tr> <tr> <td>Maximus UE-21</td> <td>\$1,595,389.635</td> <td>5.75%</td> </tr> <tr> <td>Maximus UE-11</td> <td>\$1,391,341.14</td> <td>5.02%</td> </tr> <tr> <td>Maximus UE-17</td> <td>\$1,234,409.6625</td> <td>4.45%</td> </tr> <tr> <td>Maximus UE-06</td> <td>\$1,224,085.8525</td> <td>4.41%</td> </tr> <tr> <td>Maximus UE-01</td> <td>\$1,223,866.665</td> <td>4.41%</td> </tr> <tr> <td>Maximus UE-09</td> <td>\$1,219,720.635</td> <td>4.40%</td> </tr> <tr> <td>Maximus UE-08</td> <td>\$1,212,186.36</td> <td>4.37%</td> </tr> <tr> <td>Maximus UE-03</td> <td>\$1,208,295.9525</td> <td>4.36%</td> </tr> <tr> <td>Maximus UE-10</td> <td>\$1,206,183.405</td> <td>4.35%</td> </tr> <tr> <td>Maximus UE-02</td> <td>\$1,201,455.045</td> <td>4.33%</td> </tr> <tr> <td>Maximus UE-07</td> <td>\$1,193,947.335</td> <td>4.30%</td> </tr> <tr> <td>Maximus UE-05</td> <td>\$1,193,716.4925</td> <td>4.30%</td> </tr> <tr> <td>Maximus UE-13</td> <td>\$1,125,044.2875</td> <td>4.06%</td> </tr> <tr> <td>Total</td> <td>\$27,736,358.895</td> <td>100.00%</td> </tr> </tbody> </table>	Category	Revenue	%GT Revenue	Urban	\$27,736,358.895	100.00%	Extreme	\$27,736,358.895	100.00%	Maximus UE-04	\$1,853,290.0575	6.68%	Maximus UE-21	\$1,595,389.635	5.75%	Maximus UE-11	\$1,391,341.14	5.02%	Maximus UE-17	\$1,234,409.6625	4.45%	Maximus UE-06	\$1,224,085.8525	4.41%	Maximus UE-01	\$1,223,866.665	4.41%	Maximus UE-09	\$1,219,720.635	4.40%	Maximus UE-08	\$1,212,186.36	4.37%	Maximus UE-03	\$1,208,295.9525	4.36%	Maximus UE-10	\$1,206,183.405	4.35%	Maximus UE-02	\$1,201,455.045	4.33%	Maximus UE-07	\$1,193,947.335	4.30%	Maximus UE-05	\$1,193,716.4925	4.30%	Maximus UE-13	\$1,125,044.2875	4.06%	Total	\$27,736,358.895	100.00%
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<p>166. In the Revenue by Year visual select 2019 column. Notice Maximus UE-04 and 21 are the top products. And Product 04 has nearly 7% of the grand total. Product 04 has a big spike.</p> <p>167. In the Revenue by Year visual select 2019 column to remove the filter.</p>	<table border="1"> <thead> <tr> <th>Category</th> <th>Revenue</th> <th>%GT Revenue</th> </tr> </thead> <tbody> <tr> <td>Urban</td> <td>27,736,358.90</td> <td>100.00%</td> </tr> <tr> <td>Extreme</td> <td>27,736,358.90</td> <td>100.00%</td> </tr> <tr> <td>Maximus UE-04</td> <td>1,853,290.06</td> <td>6.68%</td> </tr> <tr> <td>Maximus UE-21</td> <td>1,595,389.64</td> <td>5.75%</td> </tr> <tr> <td>Maximus UE-11</td> <td>1,391,341.14</td> <td>5.02%</td> </tr> <tr> <td>Maximus UE-17</td> <td>1,234,409.66</td> <td>4.45%</td> </tr> <tr> <td>Maximus UE-06</td> <td>1,224,085.85</td> <td>4.41%</td> </tr> <tr> <td>Maximus UE-01</td> <td>1,223,866.67</td> <td>4.41%</td> </tr> <tr> <td>Maximus UE-09</td> <td>1,219,720.64</td> <td>4.40%</td> </tr> <tr> <td>Maximus UE-08</td> <td>1,212,186.36</td> <td>4.37%</td> </tr> <tr> <td>Maximus UE-03</td> <td>1,208,295.95</td> <td>4.36%</td> </tr> <tr> <td>Maximus UE-10</td> <td>1,206,183.41</td> <td>4.35%</td> </tr> <tr> <td>Maximus UE-02</td> <td>1,201,455.05</td> <td>4.33%</td> </tr> <tr> <td>Maximus UE-07</td> <td>1,193,947.34</td> <td>4.30%</td> </tr> <tr> <td>Total</td> <td>27,736,358.90</td> <td>100.00%</td> </tr> </tbody> </table>	Category	Revenue	%GT Revenue	Urban	27,736,358.90	100.00%	Extreme	27,736,358.90	100.00%	Maximus UE-04	1,853,290.06	6.68%	Maximus UE-21	1,595,389.64	5.75%	Maximus UE-11	1,391,341.14	5.02%	Maximus UE-17	1,234,409.66	4.45%	Maximus UE-06	1,224,085.85	4.41%	Maximus UE-01	1,223,866.67	4.41%	Maximus UE-09	1,219,720.64	4.40%	Maximus UE-08	1,212,186.36	4.37%	Maximus UE-03	1,208,295.95	4.36%	Maximus UE-10	1,206,183.41	4.35%	Maximus UE-02	1,201,455.05	4.33%	Maximus UE-07	1,193,947.34	4.30%	Total	27,736,358.90	100.00%						
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<p>Earlier we created a calculated column (ZipCountry). Let's create % Growth measure so we can compare sales over time. We are going to do this in two steps.</p> <p>But first, what's the difference between measure and calculated column.</p>	<p>File Home Insert Modeling View Help Table tools Measure tools</p> <p>Name: Sales</p> <p>Structure: Mark as date table: Manage relationships: Calculations:</p> <p>New measure Quick New measure column New table</p> <p>1 PY Sales = CALCULATE(SUM(Sales[Revenue]), SAMEPERIODLASTYEAR('Date'[Date]))</p>																																																						

Calculated column is evaluated row by row. We extend a table by adding calculated columns.

Measure is used when we want to aggregate values from many rows in a table.

168. In the **FIELDS** section, select **Sales** table.

169. From the ribbon, select **Table Tools -> New Measure**. Formula bar opens.

170. Enter **PY Sales =**
**CALCULATE(SUM(Sales[Revenue]),
SAMEPERIODLASTYEAR('Date'[Date]))**

171. Select the **check mark** next to the formula bar. You will see PY Sales measure in Sales table.

Let's create another measure.

172. In the **FIELDS** section, hover over **Sales** table.

173. Click on the **ellipsis** on the right corner.

174. Select **New Measure** from the dialog. Formula bar opens.

175. Enter **% Growth =**
DIVIDE(SUM(Sales[Revenue])-[PY Sales],[PY Sales])

176. Select the **check mark** next to the formula bar. You will see % Growth measure in Sales table.

177. Select the **matrix** visual.

178. In the **FIELDS** section, click the checkbox next to the newly created **PY Sales** and **% Growth** measures in **Sales** table.

Notice fields need to be formatted.

179. From the **FIELDS** section, select **% Growth** field.

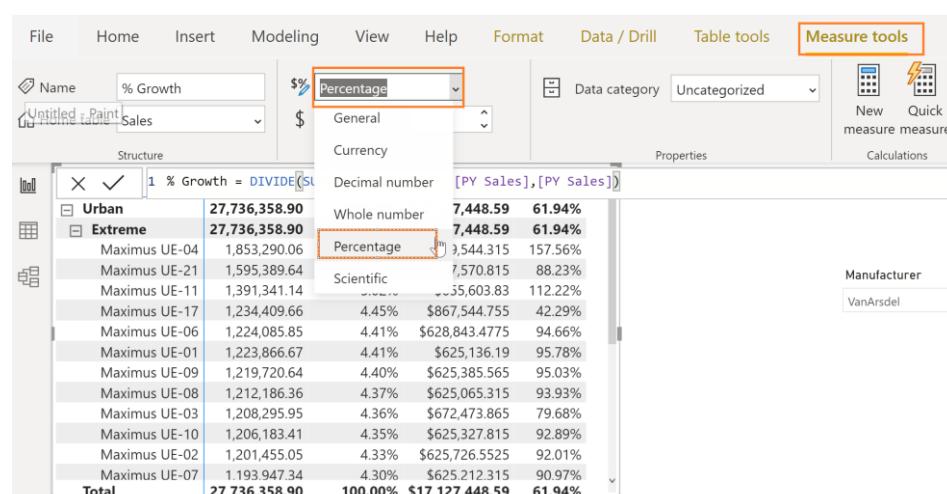
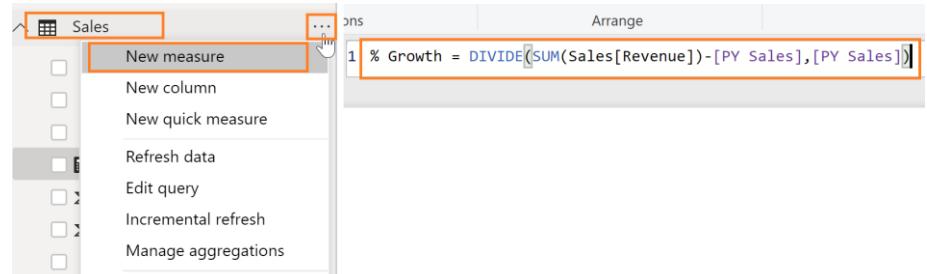
180. From the ribbon select **Measure Tools -> Format -> Percentage**

181. Similarly, from the **FIELDS** section, select **PY Sales** field.

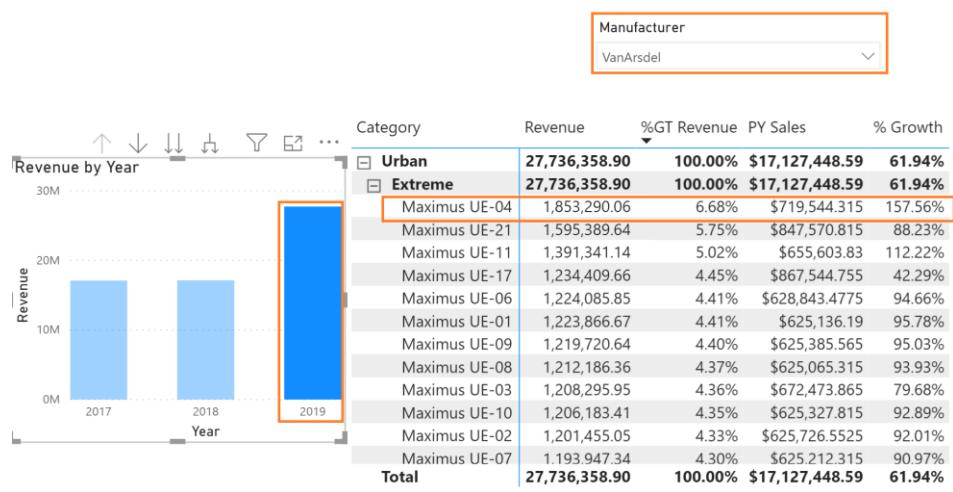
182. From the ribbon select **Measure Tools -> Format -> Currency**

183. Similarly, from the **FIELDS** section, select **Revenue** field.

184. From the ribbon select **Measure Tools -> Format -> Currency**

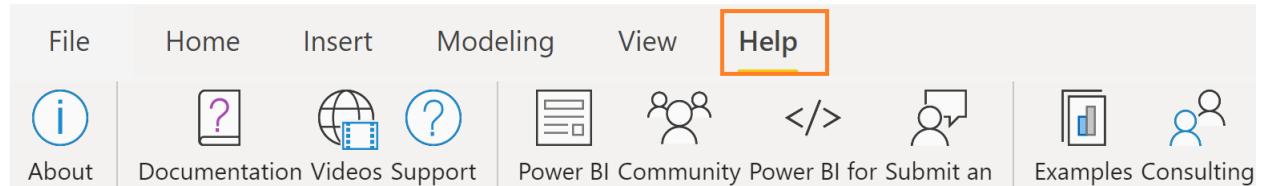


185. In the Revenue by Year visual select 2019 column. Notice Maximus UE-04 has nearly 158% growth compared to last year.



References

Dashboard in a Day introduces you to some of the key functionalities available in Power BI. In the ribbon of Power BI Desktop, the Help section has links to some great resources to help you as needed.



Here are a few more references 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>

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