100 XP

Introduction

5 minutes

In this module, you learn how to:

- Learn how to create hierarchies for organizing data
- Learn how to add and use matrix visualizations
- Learn to add DAX measures to models for further analysis

Example scenario

You continue to act as the Chief Marketing Officer (CMO) for VanArsdel, Ltd. In this scenario, you need to add a hierarchy to the data model you created for VanArsdel, Ltd in Module 3. Then after you add hierarchies to the model, you need to use a matrix visualization and DAX measures for further analysis.

Tasks to complete

In the first exercise, you'll:

- Use a hierarchy in your data model

In the second exercise, you'll:

- Build a matrix visual

In the final exercise of this module, you'll:

- Add DAX measures to your data model

What is the main goal?

By the end of this session, you're able to:

- Use and create matrix visuals

- Add hierarchies to data models
- Drill up and drill down
- Write DAX expressions
- Add DAX measures to models
- Use calculated columns

Next unit: Use hierarchies in your data model

Continue >

100 XP

Use hierarchies in your data model

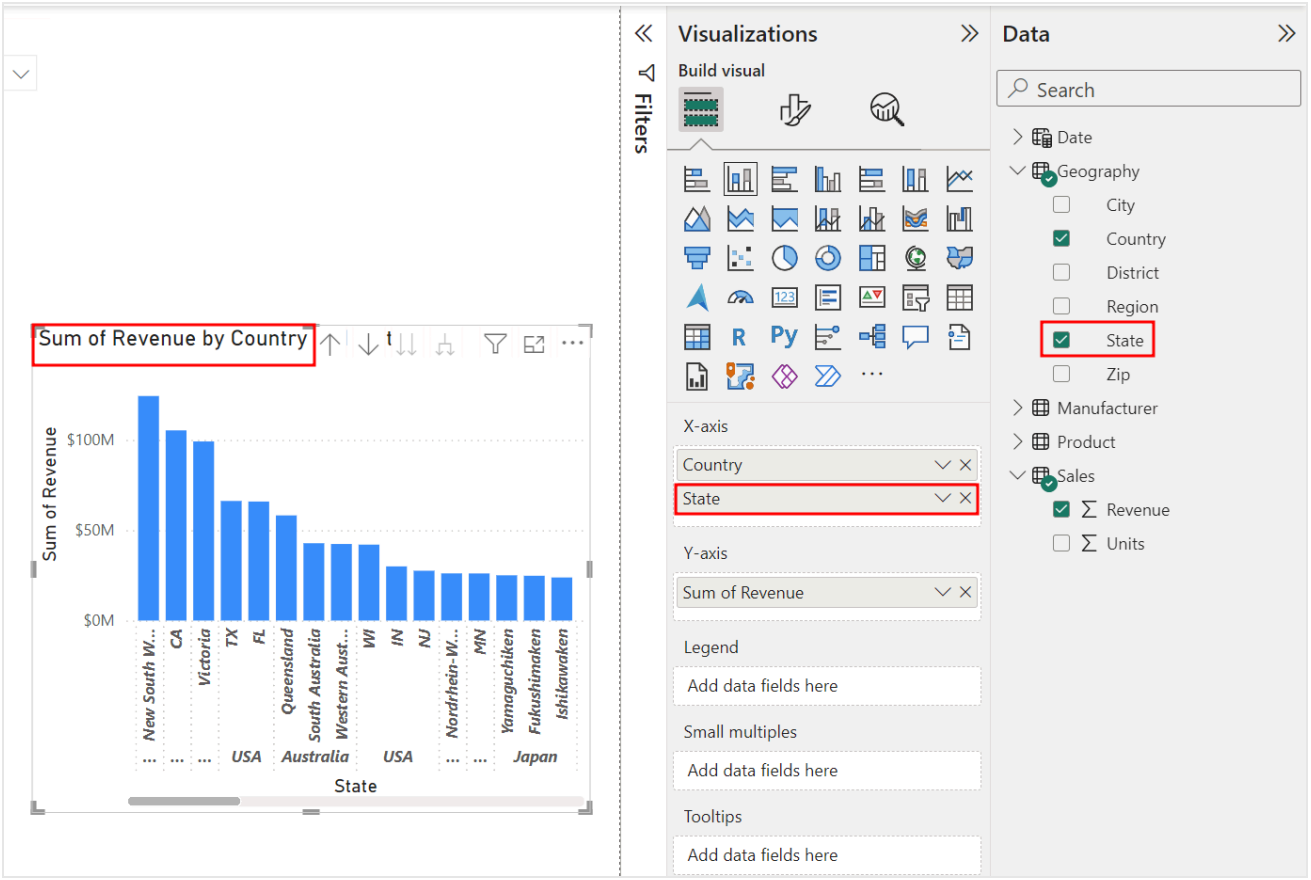
15 minutes

Make sure you're currently viewing the report you created titled **MyFirstPowerBIModel** from the previous units. If you're starting from this module, or missed the previous, start with the **Lab 2 solution.pbix** file located in the **Reports** folder in the student files.

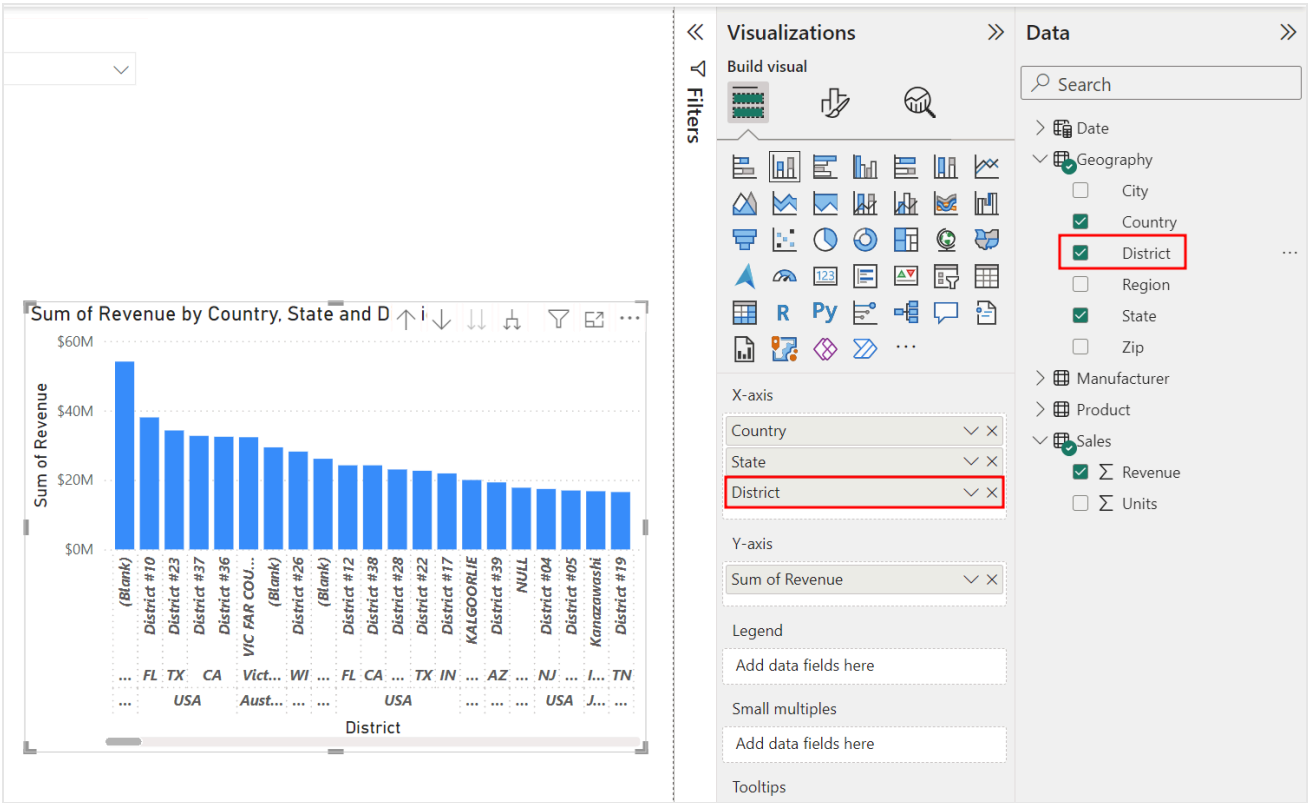
In this exercise, you explore the use of hierarchies in your first data model and how to create them. You're still the CMO for VanArsdel, Ltd. in this exercise and you model the data for Australia, VanArsdel, Ltd. and 2021. Check if the spike occurred in a specific region in Australia.

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

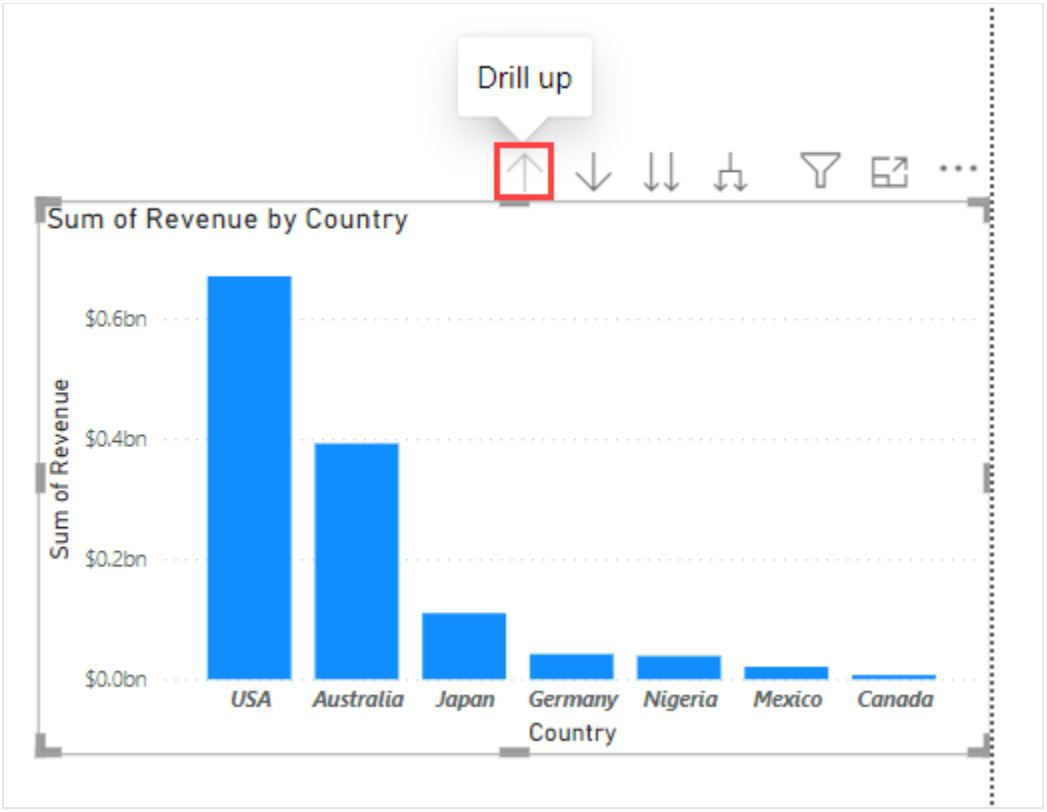
2. From the **Data** pane, drag and drop the **State** field from the **Geography** table below the **Country** field in the **X-axis** section of the **Visualizations** pane.



3. Drag and drop the **District** field from the **Geography** table below the **State** field in the **X-axis** section of the **Visualizations** pane. You just created a hierarchy.

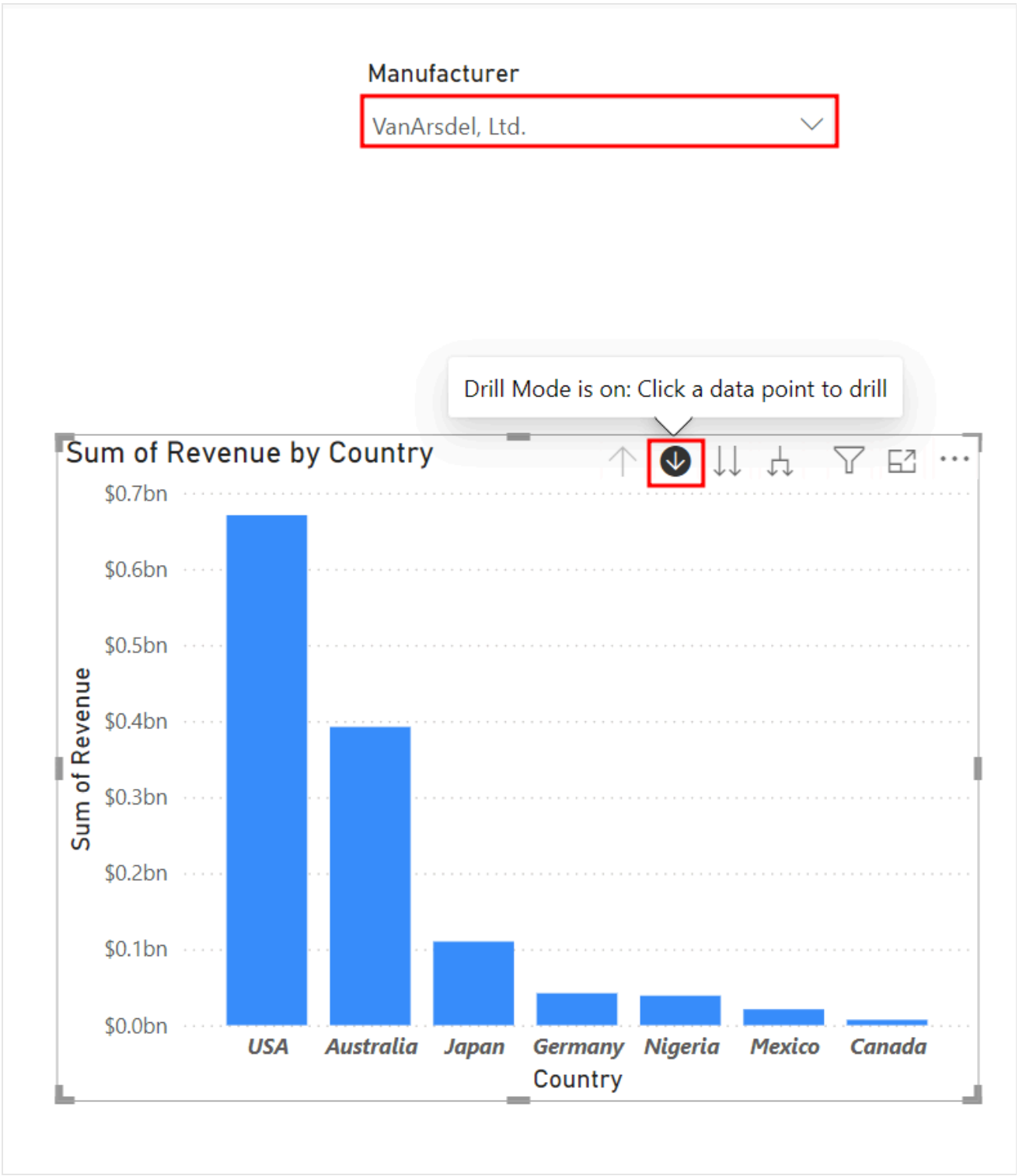


4. Select the **up arrow** in the **header** area of the visual twice to **Drill up** to the top level of the hierarchy again.



5. Make sure that **VanArsdel, Ltd.** is still selected in the **Manufacturer** slicer.

6. Turn on the **Drill down mode** by selecting the **down arrow** of the **Sum of Revenue by Country** visual once.

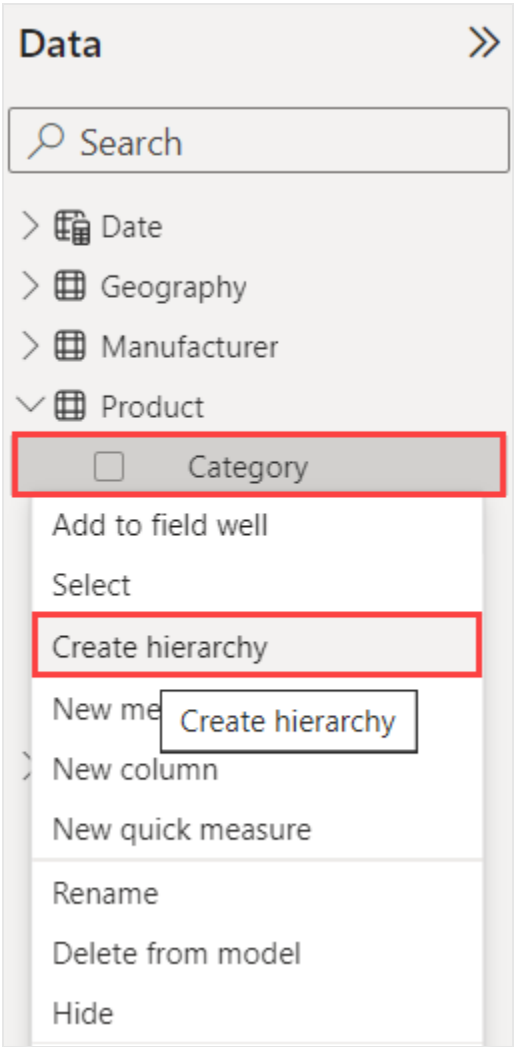


7. Select **Australia** to drill down to the **State** level.

8. 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**, then **Data / Drill**, and disable *Data point table* in the ribbon.

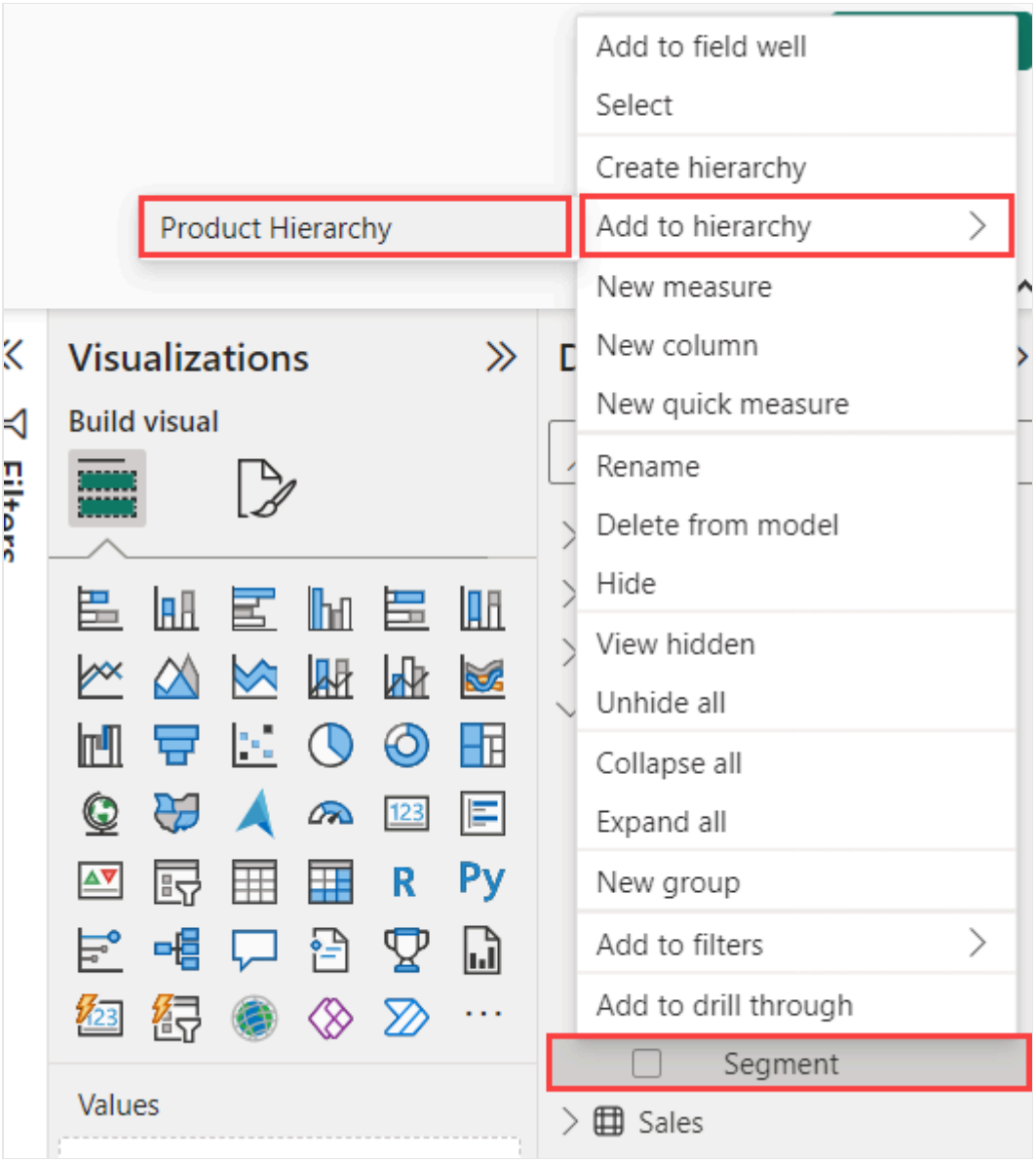
9. Now, **Drill up** to the **Country** level again.
10. **Turn off** drill mode by selecting the down arrow again on the **Sum of Revenue by Country** visual. Now analyze the data by product. To start, create a product hierarchy.
11. Make sure that no visuals are selected in the design canvas.
12. From the **Data** pane, **right-click** the **Category** field in the **Product** table
13. Select **Create Hierarchy**.



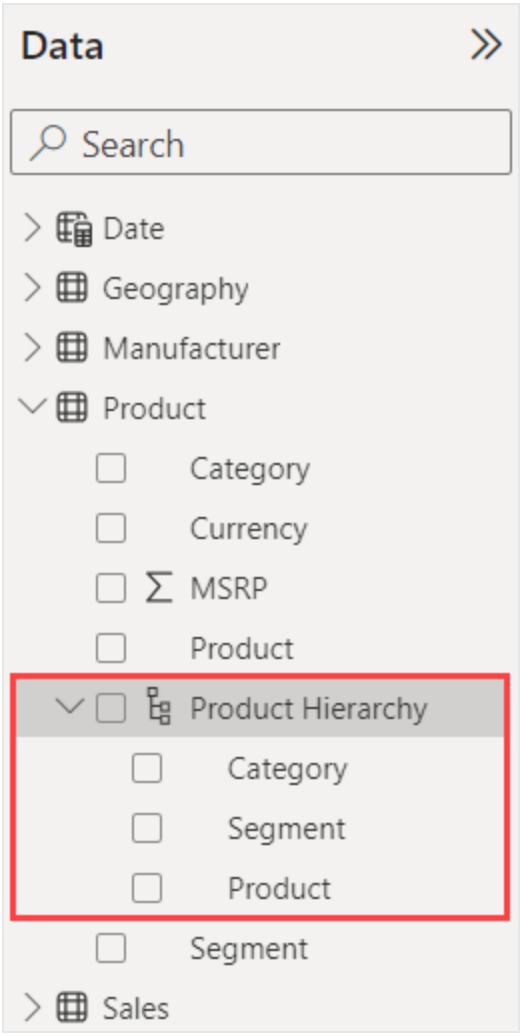
14. You see a new object called **Category Hierarchy** is created inside the **Product** table.

Double-click **Category Hierarchy** and rename it to **Product Hierarchy**.

1. **Right-click** the **Segment** field in the **Product** table.
2. Select **Add to Hierarchy**, and then choose **Product Hierarchy**.

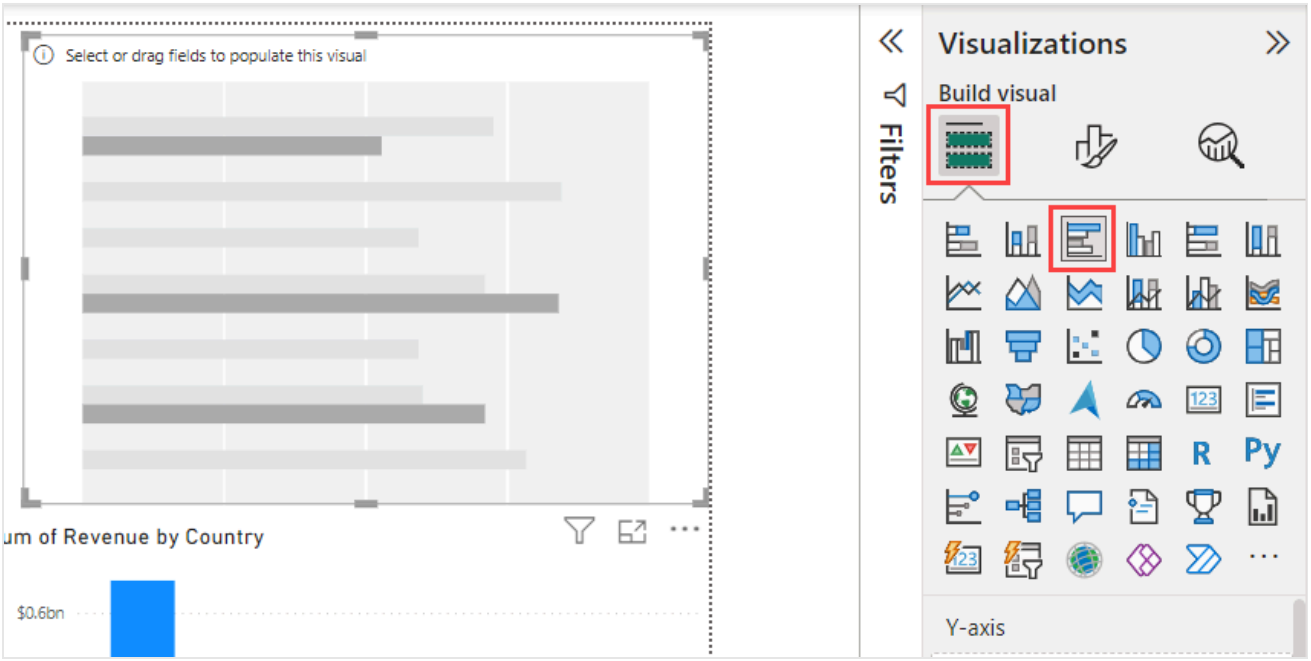


3. Use steps 11-16 to add the **Product field** from the Product table to the Product Hierarchy. You created a Product Hierarchy with the fields **Category**, **Segment**, and **Product**.



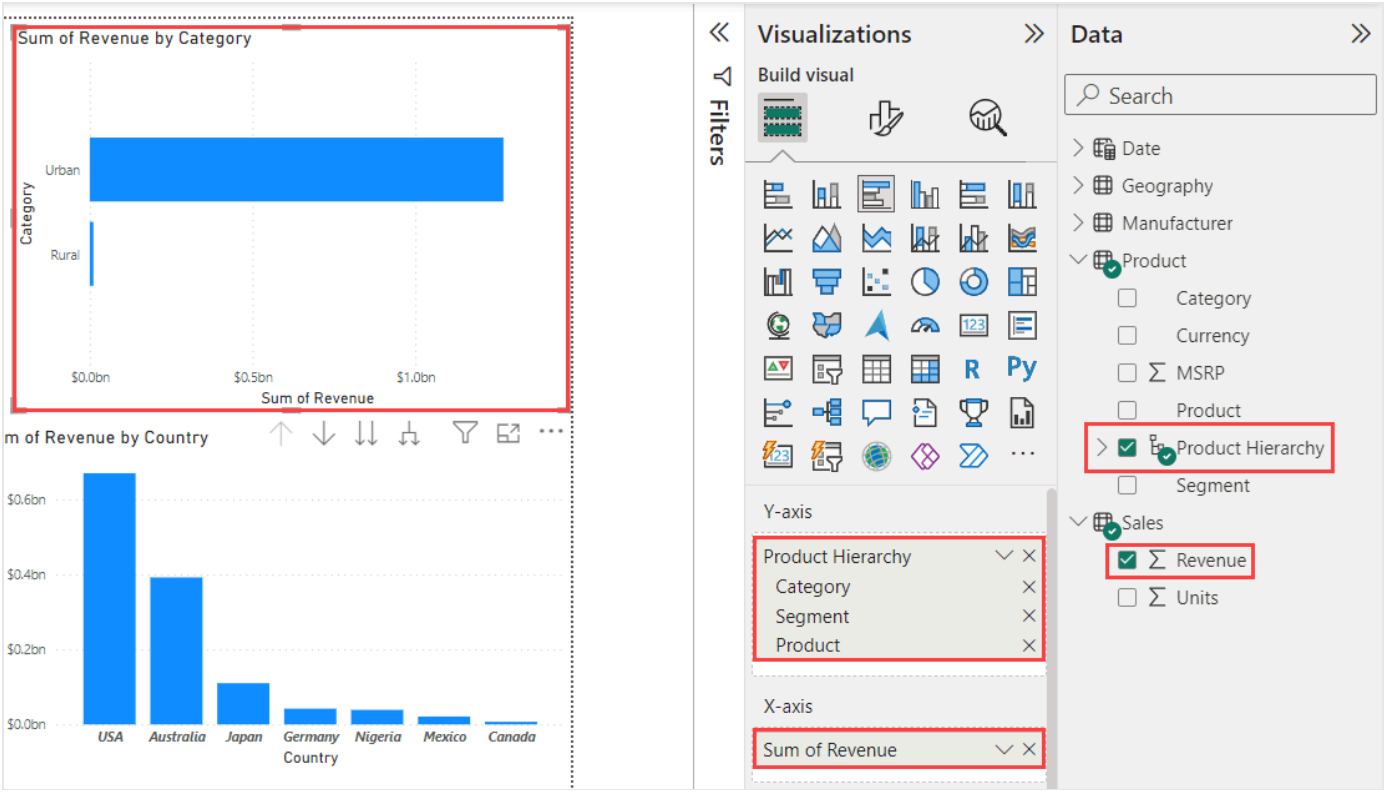
4. Select the white space in the canvas to deselect any visual that might be selected.

5. From the **Visualizations** pane, select **Clustered bar chart**.



6. With the **Clustered bar chart** still selected, from the **Data** pane, expand the **Product** table.
7. Select the **checkbox** to the left of the **Product Hierarchy**. Notice the complete hierarchy is selected.
8. From the **Data** pane, expand the **Sales** table.
9. Select the **checkbox** to the left of the **Revenue** field.

> **Note**
>
> The **Product Hierarchy** is added to the **Y-axis** field and **Sum of Revenue** is added to the **X-axis** field in the **Visualizations** pane. You see the visual in the canvas change and update as you select different fields.



Next unit: Build a matrix visual

Continue >

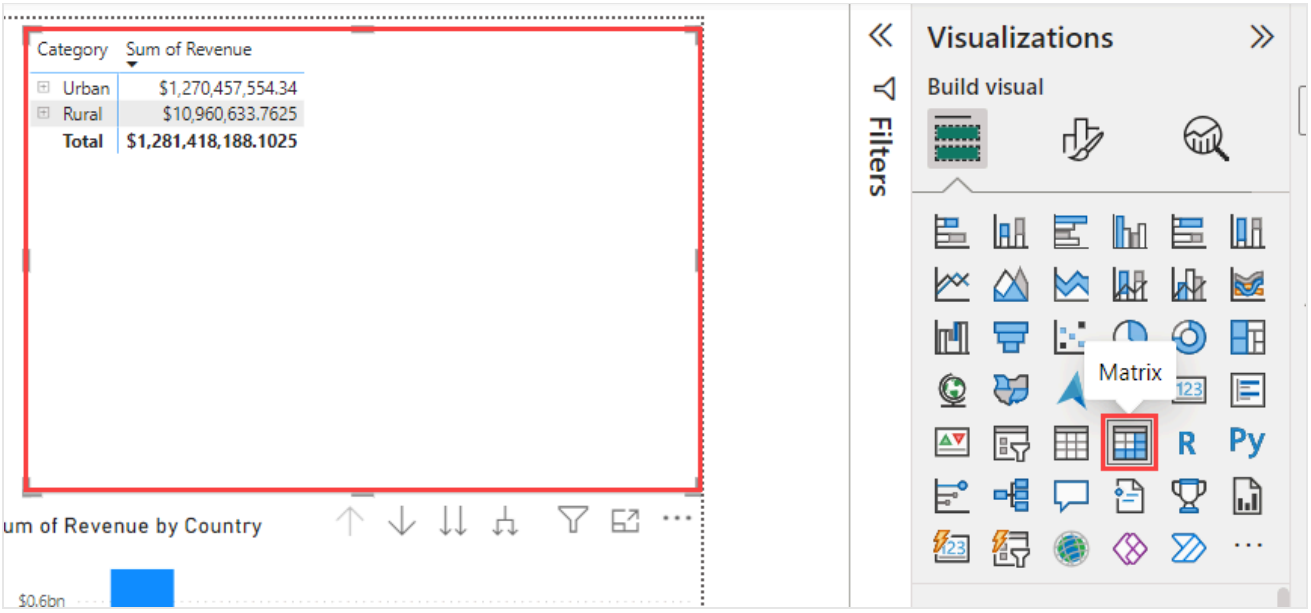
100 XP

Build a matrix visual

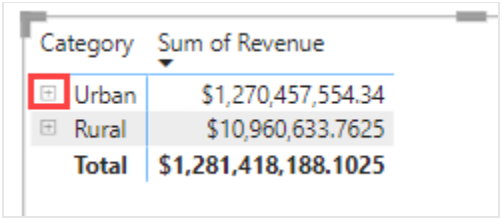
15 minutes

Now, add a Matrix visual so you can view the data in rows and columns. You can apply conditional formatting to the Matrix visual to highlight the outliers.

1. Select the **Sum of Revenue by Category** Clustered bar chart and change it to a **Matrix** visual.

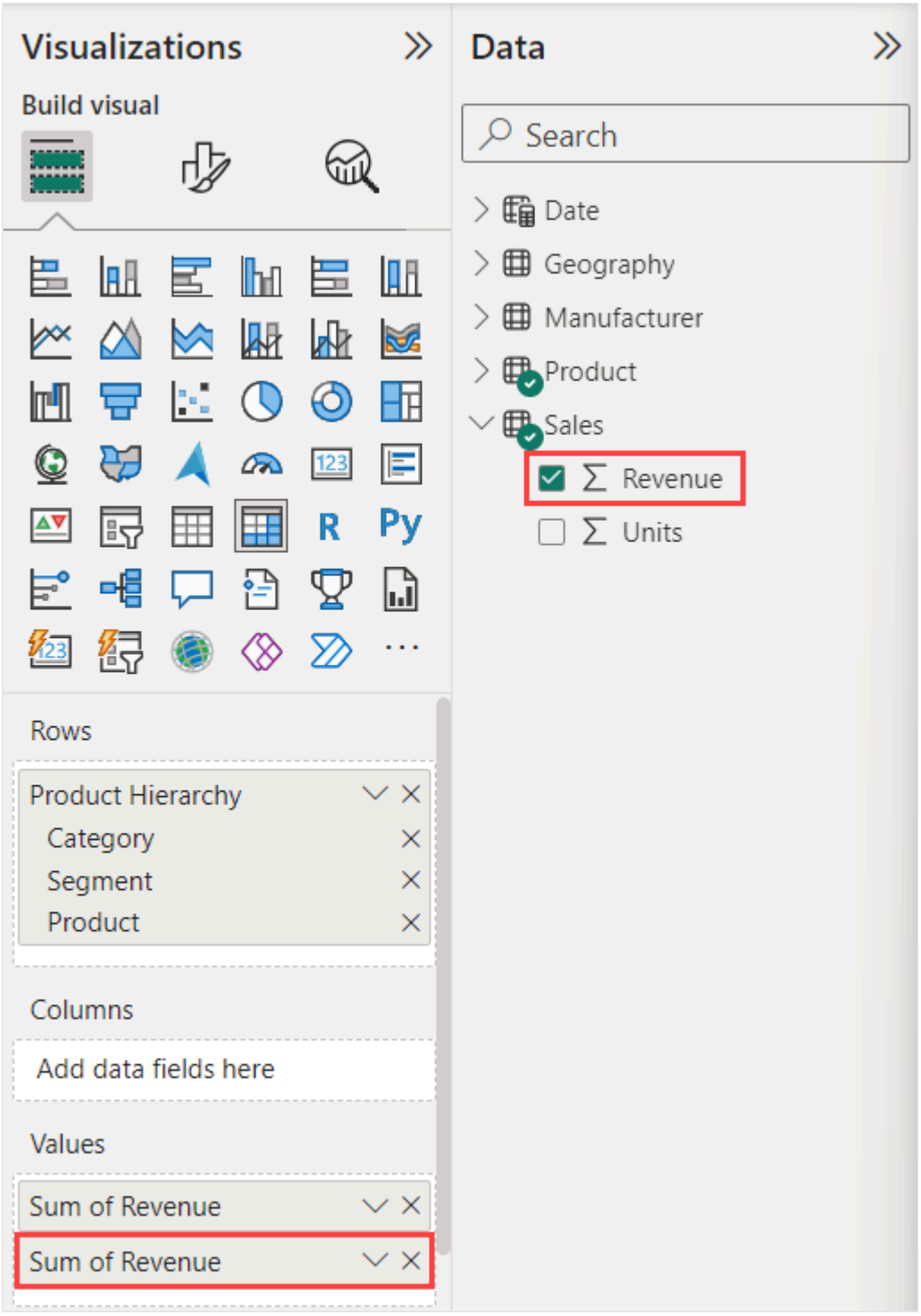


2. Select the **+ (plus sign)** to the left of the **Urban** row to drill down.



3. Now add the percentage of the total field to the visual to give you a better perspective on the data. With the **Matrix** selected, go to the **Data** pane.

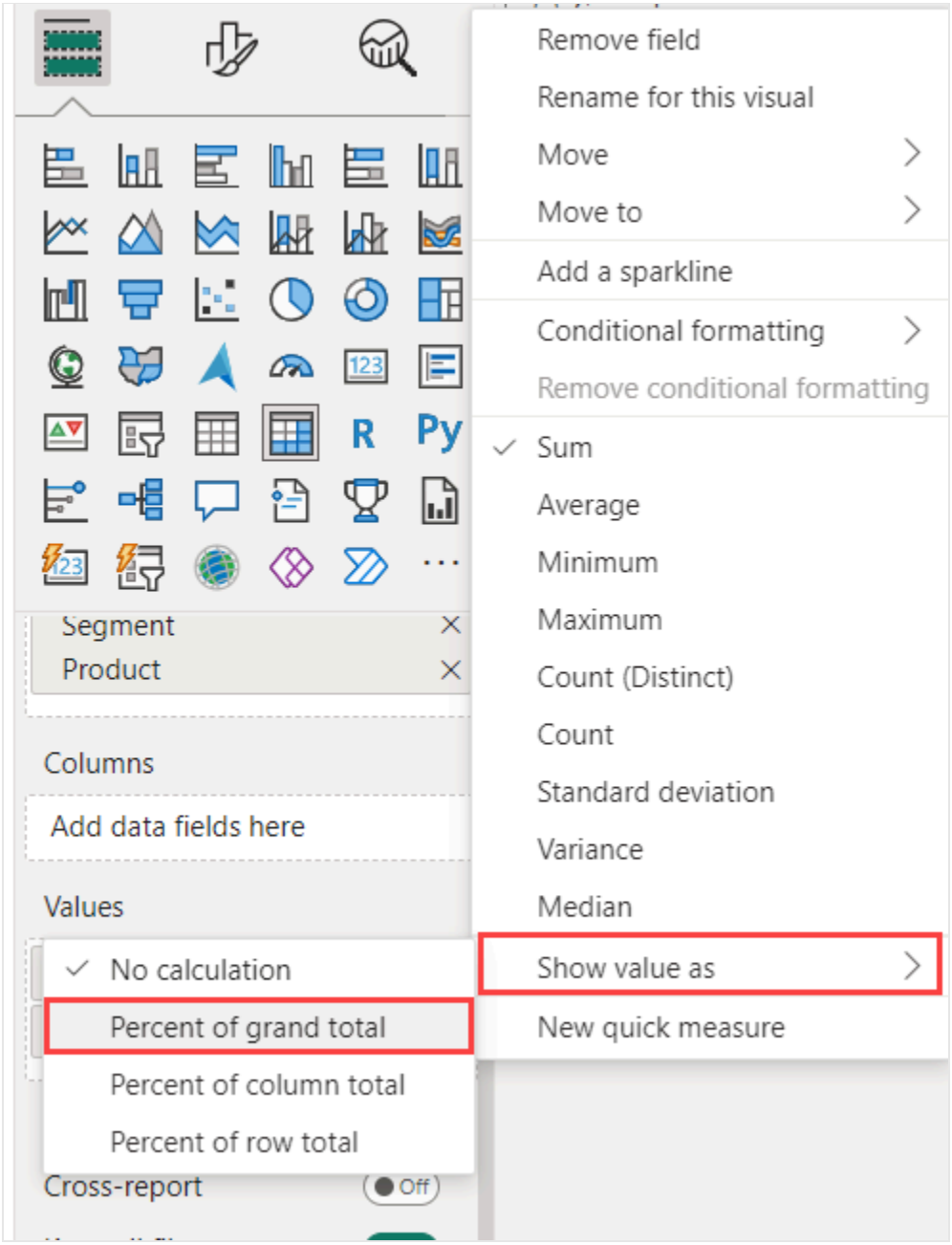
4. From the **Data** pane, drag and drop the **Revenue** field from the **Sales** table to below the existing **Sum of Revenue** field in the **Values** section of the **Visualizations** pane. It looks like **Sum of Revenue** is in the **Values** section twice.



5. Select the **down arrow** to the right of the newly added **Sum of Revenue** field in the **Values** section.

6. From the visual field menu, hover over **Show value as**.

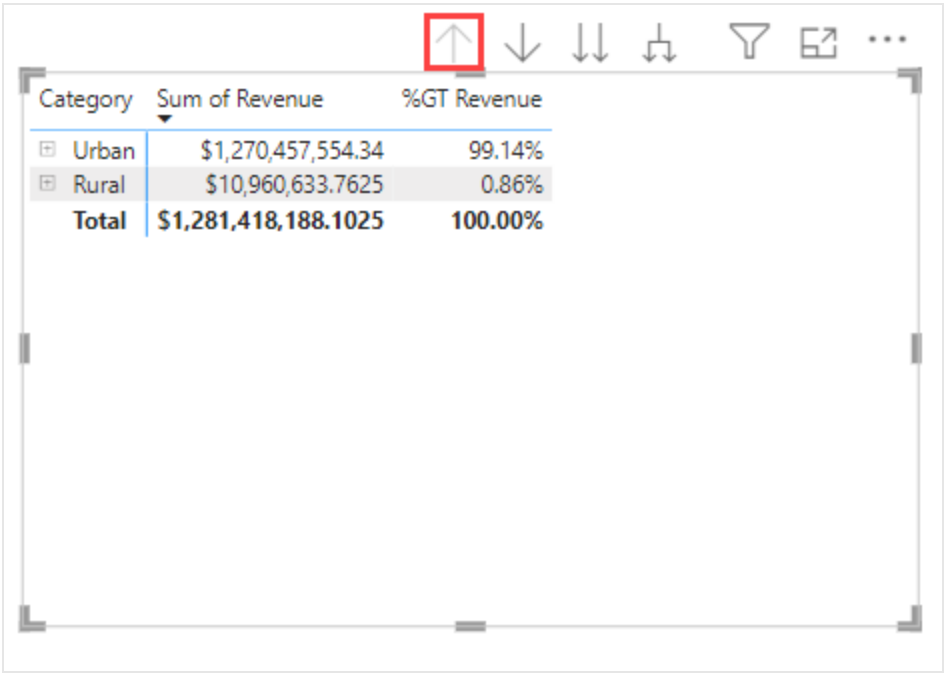
7. Then, select **Percent of grand total**.



8. Rick-click on the newly created field and select **Rename for this visual**.

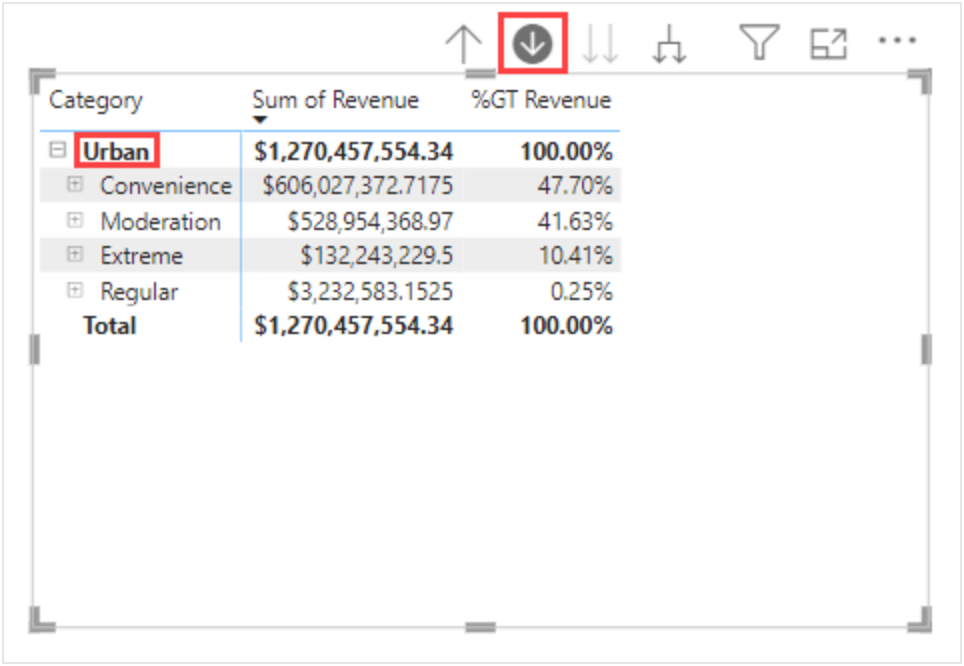
9. Name the field **%GT Revenue**.

10. Drill back up to **Category** level if you aren't already there in the **Matrix** visual.



11. Then, select **Enable drill down mode** in the header of the Matrix visual.

12. Now, select the word **Urban**.



13. Make sure that the **Matrix** visual is still selected. Then, multi-select the **2021** column in the **Sum of Revenue by Year** visual and the **Australia** column in the **Sum of Revenue by Country** visual.

14. Now, look at the **Extreme** category for Australia over time. You notice the **Extreme** segment has around **40%** of the grand total.

Category	Sum of 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%**

15. Now, **drill down** into the **Extreme Segment** to determine if a **Product** stands out.

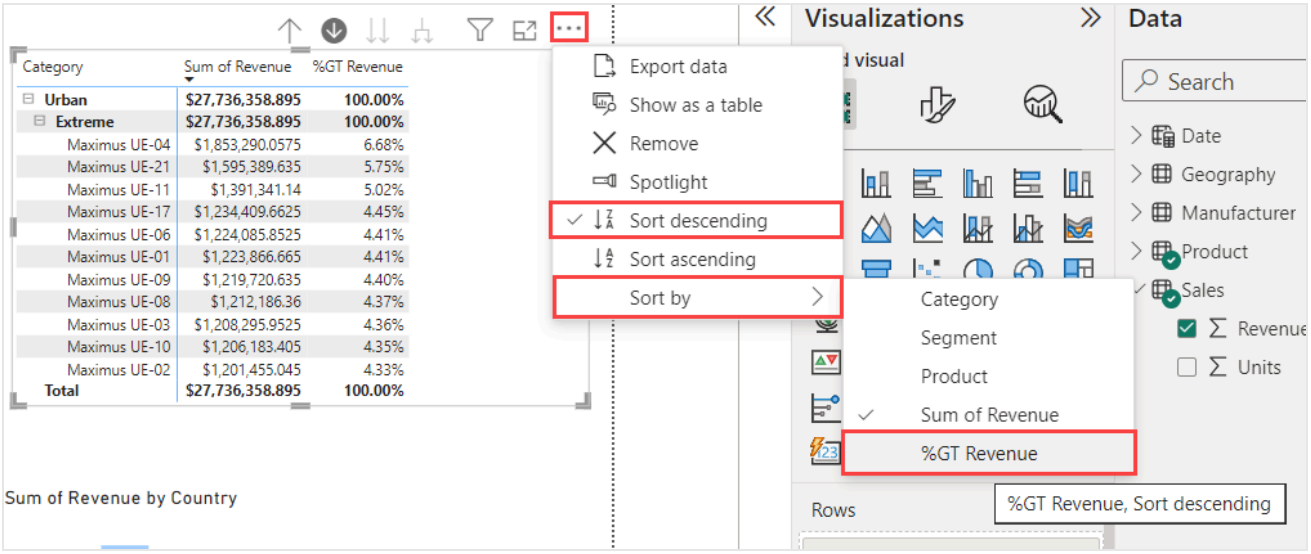
16. In the **Matrix** visual, select the **Extreme** row to drill down to the **Product** level.

17. Resize the visual as needed.

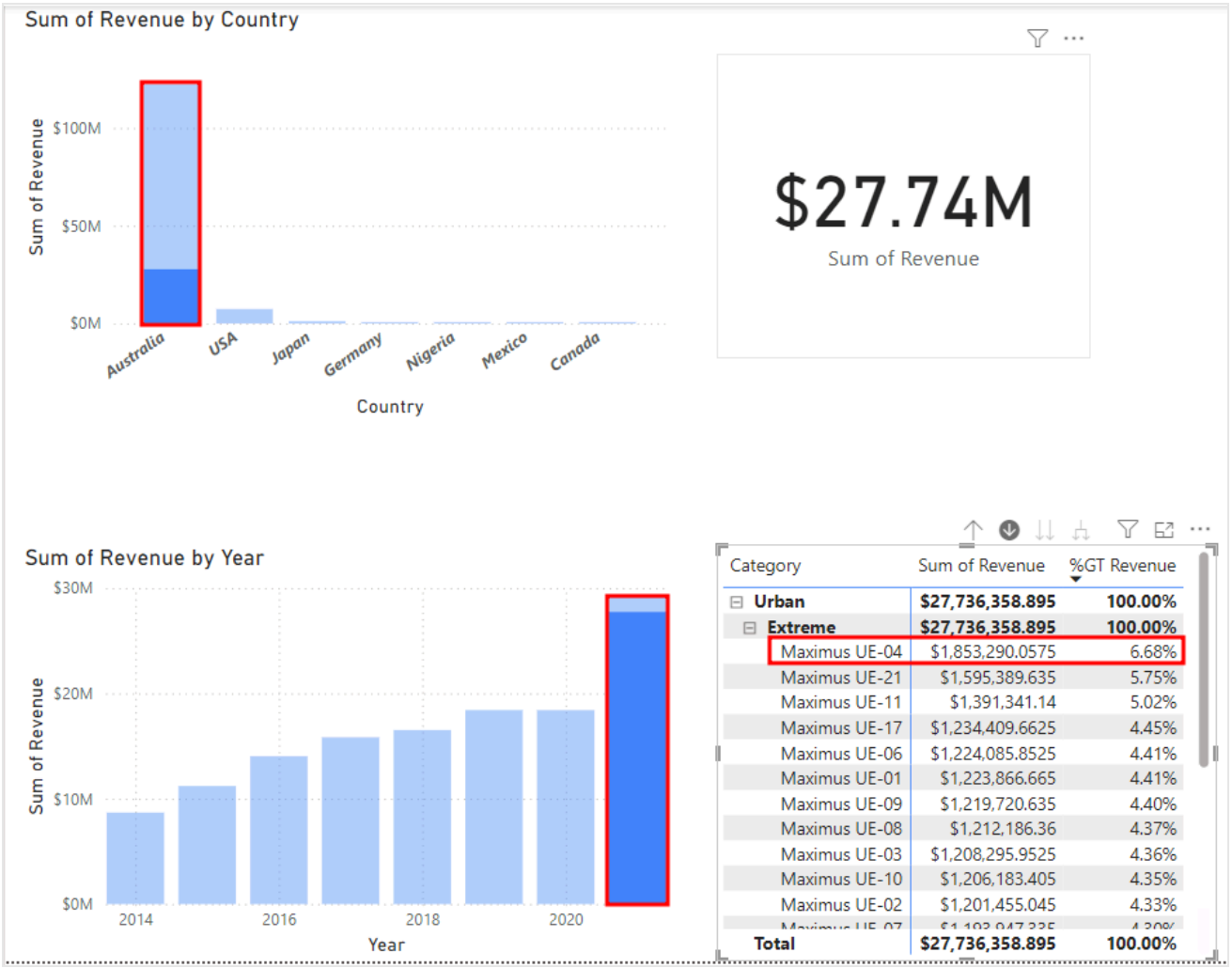
Category	Sum of Revenue	%GT Revenue
Urban	**$27,736,358.895**	**100.00%**
Extreme	**$27,736,358.895**	**100.00%**
Maximus UE-04	$1,853,290.0575	6.68%
Maximus UE-21	$1,595,389.635	5.75%
Maximus UE-11	$1,391,341.14	5.02%
Maximus UE-17	$1,234,409.6625	4.45%
Maximus UE-06	$1,224,085.8525	4.41%
Maximus UE-01	$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%
Total	**$27,736,358.895**	**100.00%**

18. Select the **ellipses (...)** in the top right corner of the matrix visual header.

19. Select **Sort By** > **%GT Revenue** and **Sort Descending** also (should be selected by default).



20. Now you can see the top Products. Make sure **2021** is selected in the **Sum of Revenue by Year** visual, and **Australia** in the **Sum of Revenue by Country** visual. You notice Maximus UE-04 and Maximus UE-21 are the top products. You also see that Product **Maximus UE-04** has nearly **7%** of the grand total.



Next unit: Build DAX measures

Continue >

100 XP

Build DAX measures

15 minutes

Earlier you created a calculated column named **ZipCountry** using Data Analysis Expression (DAX). Now, create a **Percent Growth** calculated measure so you can compare sales over time.

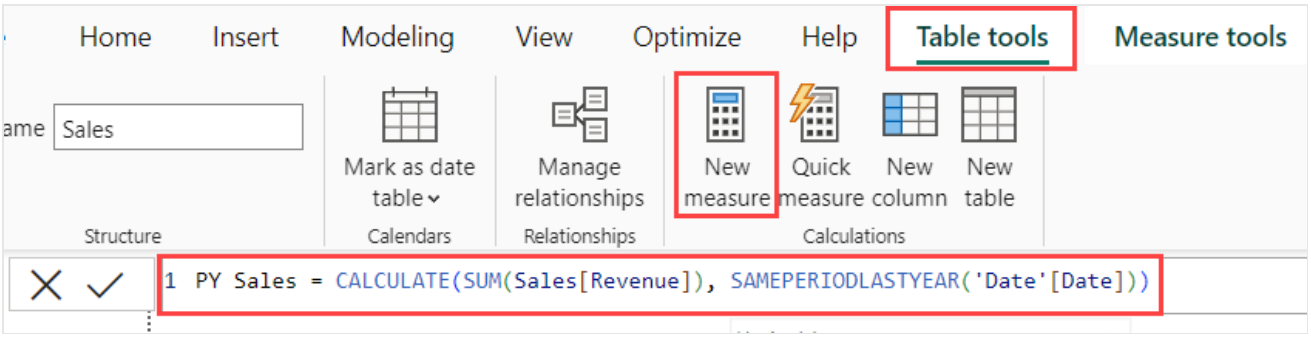
Before you start, learn the difference between a measure and a calculated column:

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

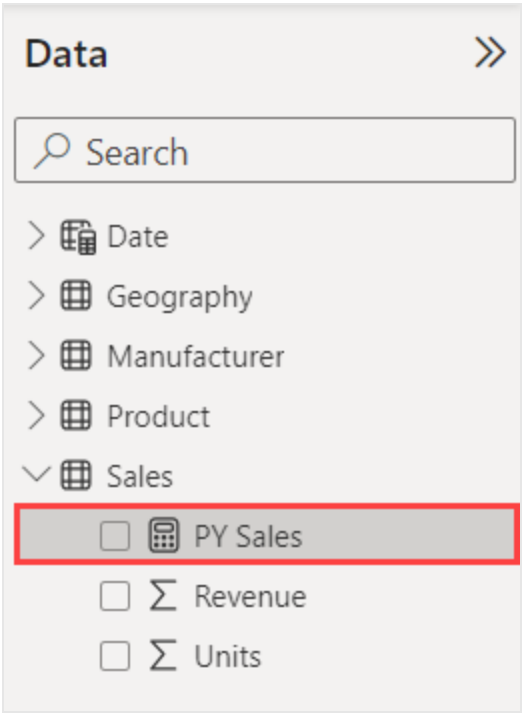
> **Tip**
>
> Calculated columns are often better suited to be created in the Power Query Editor or as part of the data importing process because of the row-by-row evaluation mentioned above.

1. In the **Data** pane, select the **Sales** table.
2. From the ribbon at the top of the screen, select the **Table Tools** tab, then select **New Measure**. A formula bar appears.
3. Enter the formula:

```
PY Sales = CALCULATE(SUM(Sales[Revenue]), SAMEPERIODLASTYEAR('Date'[Date]))
```



4. Select the **checkmark** to the left of the formula bar or hit **Enter** on your keyboard. You see the **PY Sales** measure created in the **Sales** table.

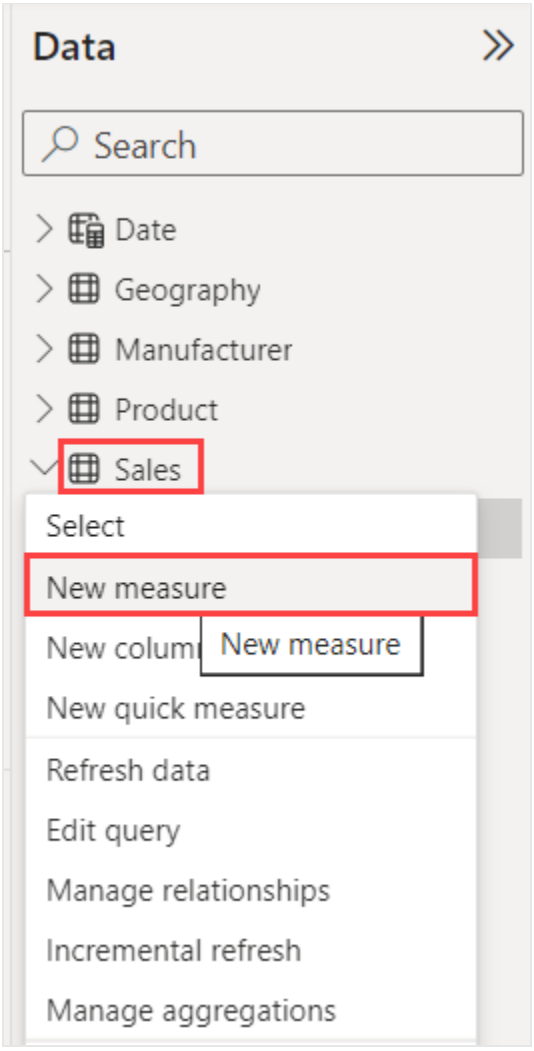


5. Now, create another measure using a different method. In the **Data** pane, **right-click** the **Sales** table.

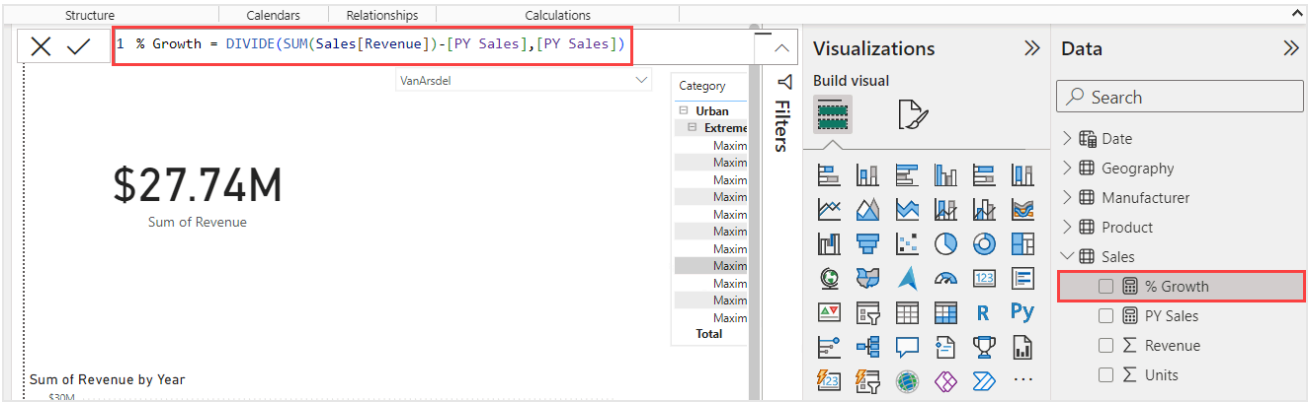
6. Select **New Measure** from the options menu. A formula bar opens.

7. In the formula bar, enter the following formula:

```
% Growth = DIVIDE(SUM(Sales[Revenue])-[PY Sales],[PY Sales])
```



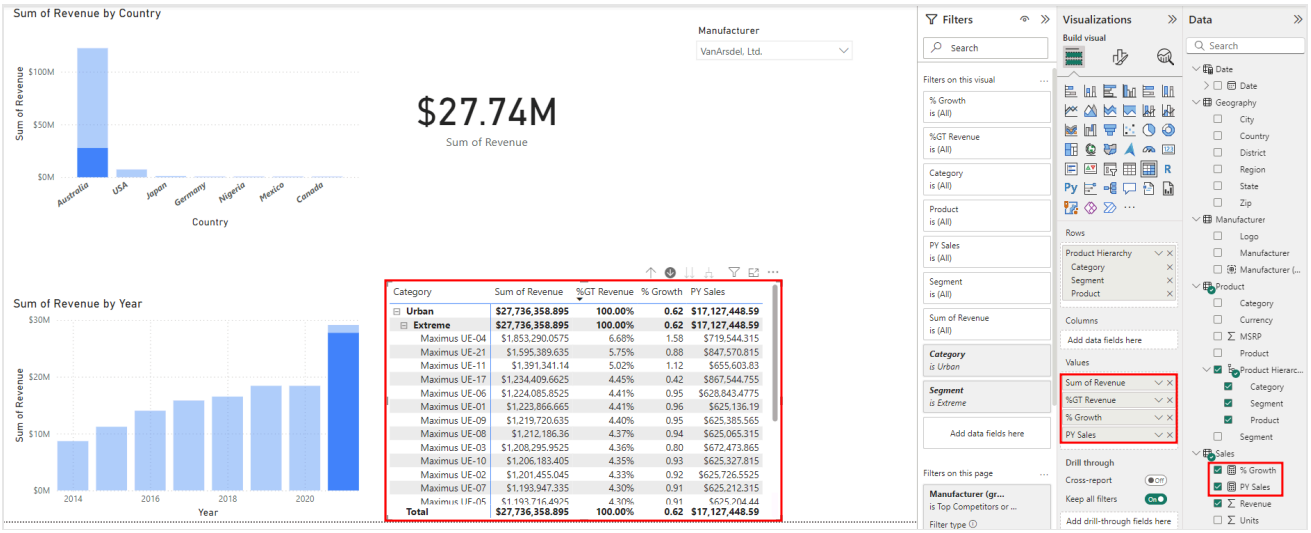
8. Select the **checkmark** next to the formula bar or hit **Enter** on your keyboard. You see the **% Growth** measure added to the **Sales** table.



9. Make sure the **Matrix** visual is still selected. If not, select the **Matrix** visual and check that you still have the **Australia** and **2021** columns selected in the other visuals.

10. In the **Data** pane, select the **checkbox** next to the newly created **PY Sales** and **% Growth** measures in the **Sales** table. This action adds the measures to the **Values** section of the **Matrix**.

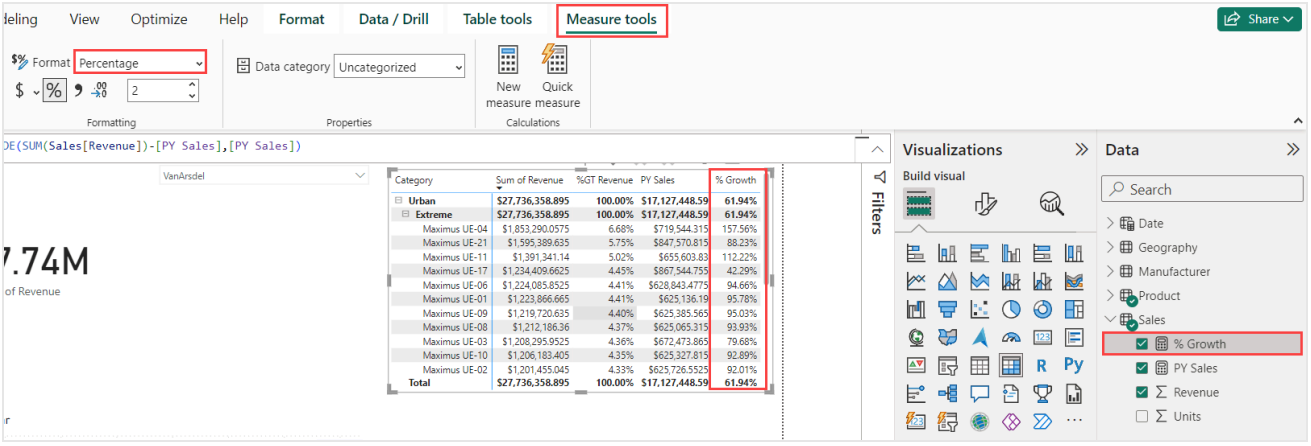
11. Resize the **Matrix** to see the newly added fields (you might also have to adjust the size of the other visuals where needed).



12. To format the fields, start from the **Data** pane, select the **% Growth** field (the name, not the checkbox) in the **Sales** table.

13. From the ribbon at the top of the screen, select the **Measure Tools** tab, choose the **Format** drop-down.

14. Then, select **Percentage**.



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

15. From the **Data** pane, select the **PY Sales** field (the name, not the checkbox) in the **Sales** table.

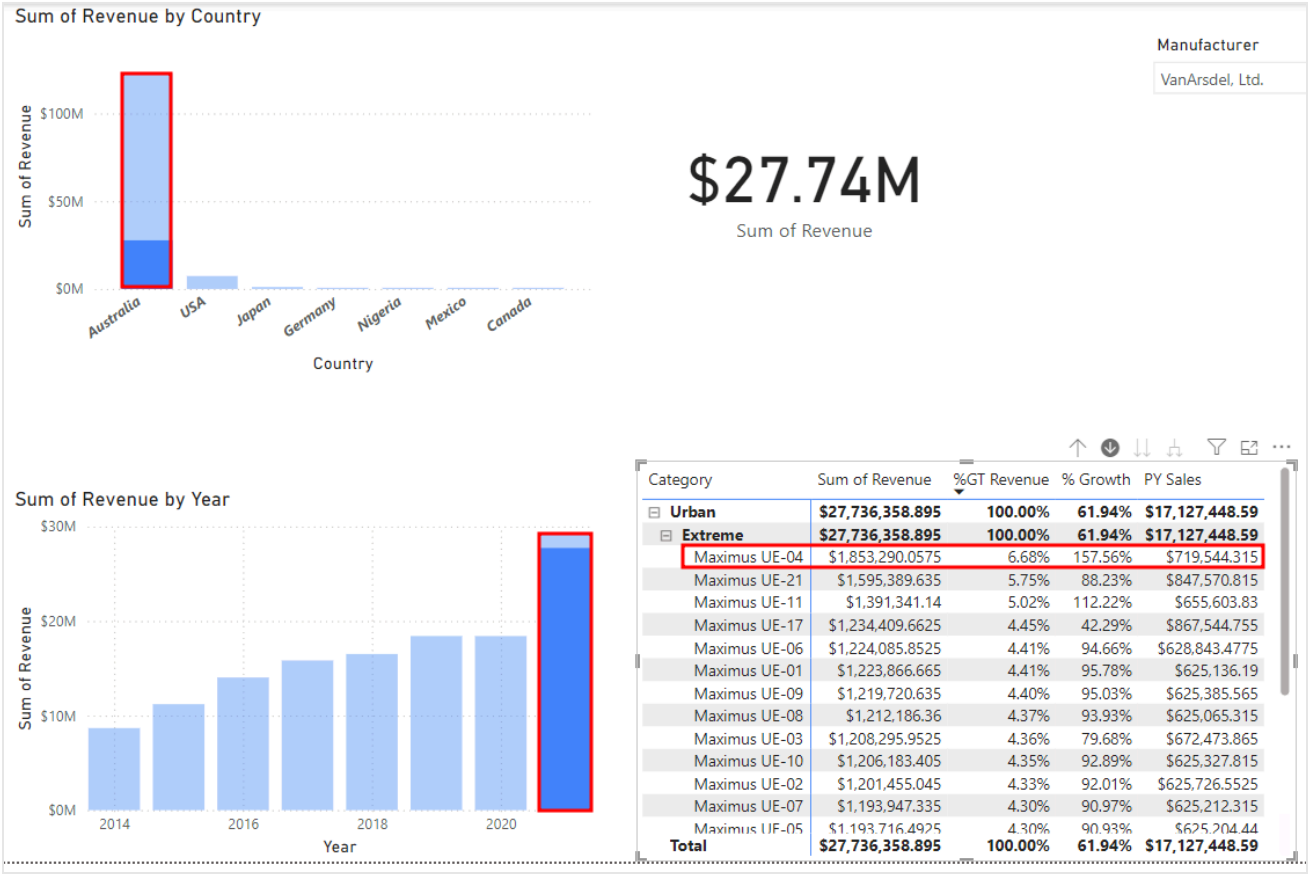
16. From the ribbon at the top of the screen, select the **Measure Tools** tab, choose the **Format** drop-down.

17. Then, select **Currency** (if it isn't already formatted to Currency).

18. From the Data pane, select the Revenue field in the Sales table.

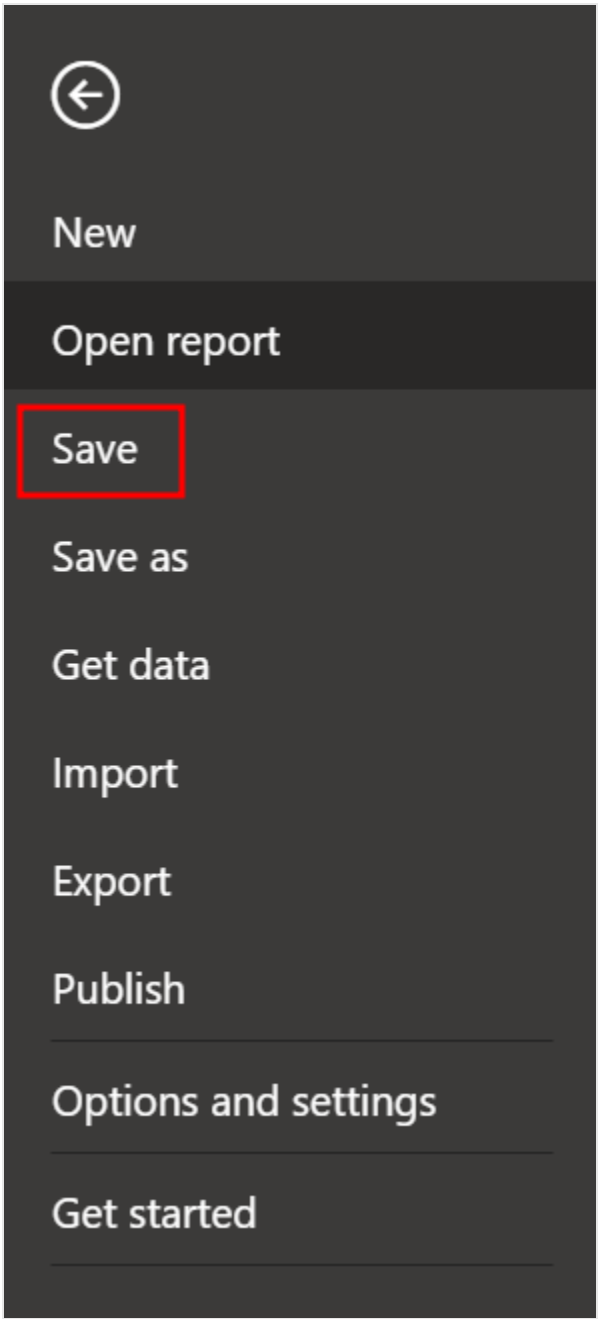
19. Now, choose the **Format** drop-down under the **Table tools** tab, and then select **Currency**.

20. Make sure you still have **Australia** selected in the **Sum of Revenue by Country** visual, and you still have the **2021** column selected in the **Sum of Revenue by Year visual**. You notice **Maximus UE-04** has nearly **158%** growth compared to last year.



21. Select the white space in the canvas to **deselect** any of the possible selected visuals.

22. Then, from the ribbon at the top of the screen, select **File**, and choose **Save** from the menu to the left of the screen.



Make sure to keep your *MyFirstPowerBIModel* file; you need it for the upcoming modules.

Next unit: Knowledge check

Continue >

100 XP

Summary

5 minutes

In this scenario, you're a CMO adding measures to a data model for the company, VanArsdel, Ltd.

In this module, you learned how to build upon a data model using hierarchies, matrix visuals, and Data Analysis Expression (DAX).

Learned concepts:

- The difference between a measure and a calculated column
- Hierarchical data and drilling up/down
- Creation and utilization of a Date table
- Utilizing Matrix visuals for data presentation
- The use of DAX measures and calculated columns

You build upon what you learned in this module to continue working as CMO for VanArsdel, Ltd. in Module 5.

References

- Drill mode in the Power BI service
- Create matrix visualizations in Power BI
- Learn DAX basics in Power BI Desktop

Module incomplete:

Go back to finish