

Working with Power BI and Power BI Desktop

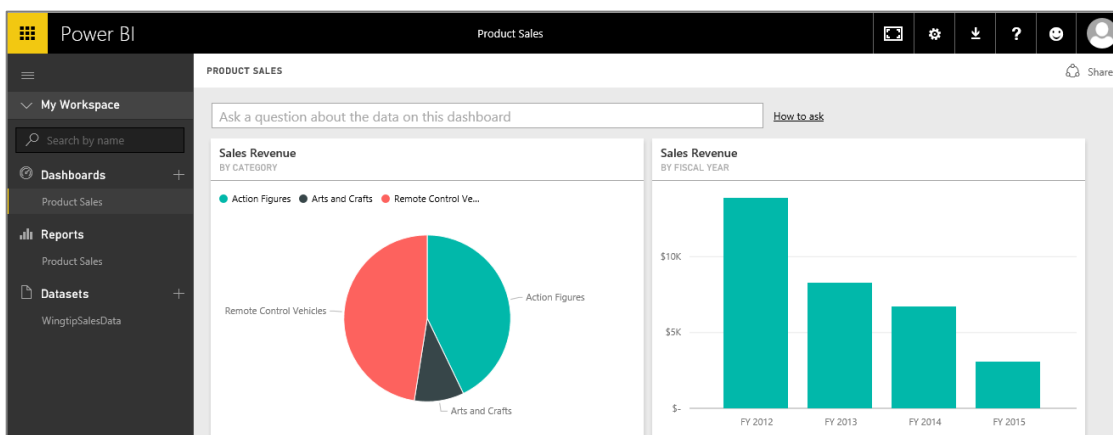
Lab Time: 60 minutes

Lab Overview: In this lab you will learn how to install and begin working with Power BI Desktop. You will learn how to import data using Power Query to create a dataset and you will also learn how model the data within the dataset using Power Pivot. After modeling the data to make it better suited for analysis, you will create a report and publish it to the Power BI service.

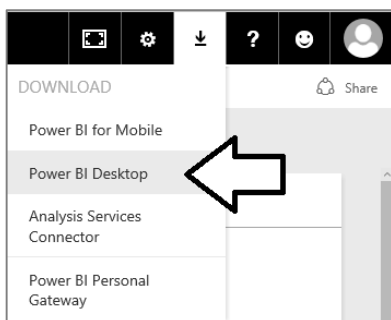
Exercise 1: Installing and Configuring Power BI Desktop

In this exercise you will download and install Power BI Desktop. Note that if Power BI desktop is already installed on your student workstation, you can move ahead to exercise 2.

1. Launch the browser and navigate to the landing page of the Power BI service at <https://app.powerbi.com>. Make sure you log on to the Power BI service using the primary Office 365 account you used to create the Office 365 tenancy and not the secondary user account you used at the end of the previous lab to test dashboard sharing. Inside your personal workspace, you should see the dataset, report and dashboard you created in the previous lab.



2. On the top right of the Power BI service window, drop down the **Downloads** menu and click the **Power BI Desktop** menu command to begin the download of the installation file.



3. Wait for the MSI file to download.



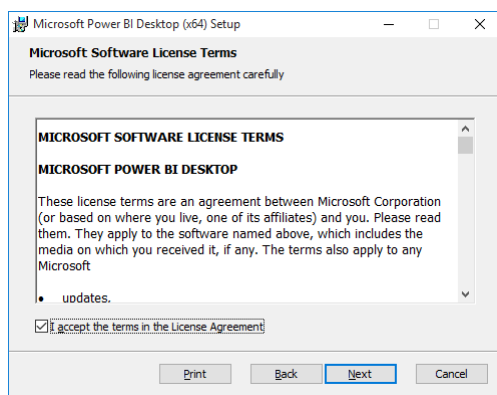
4. Once the file has downloaded, click the **Run** button to begin the installation of Power BI Desktop.



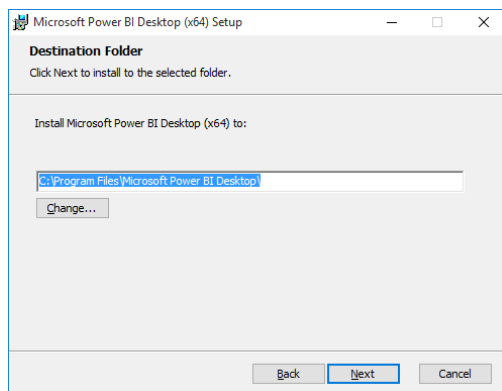
5. When you see the Welcome screen, click **Next** to continue with the installation.



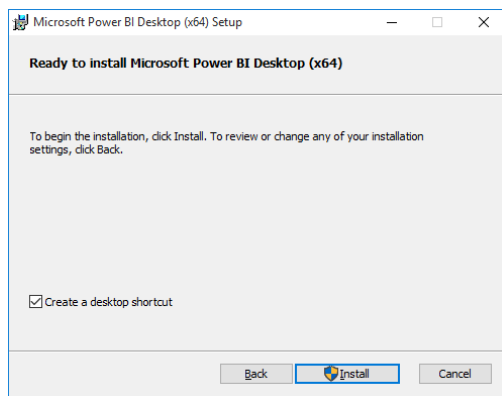
6. Click the checkbox to accept the license agreement and click **Next**.



7. Accept the default location for the installation and click **Next**.



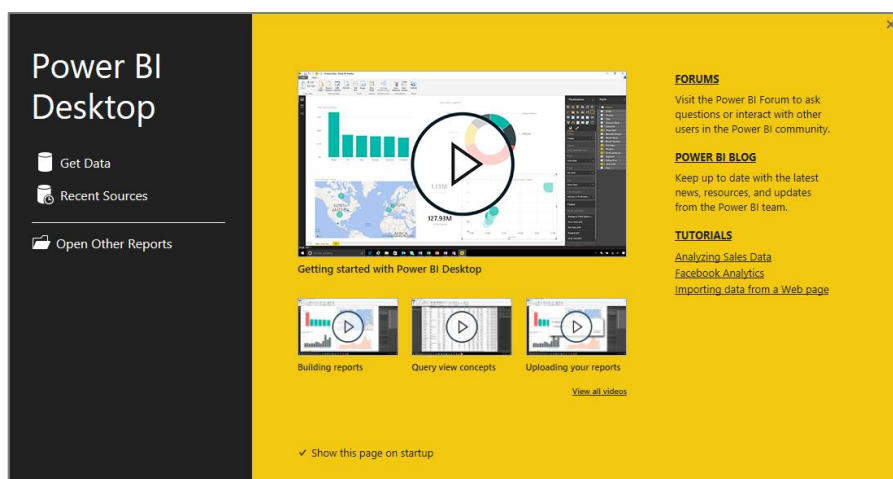
8. On the next screen, click **Install**.



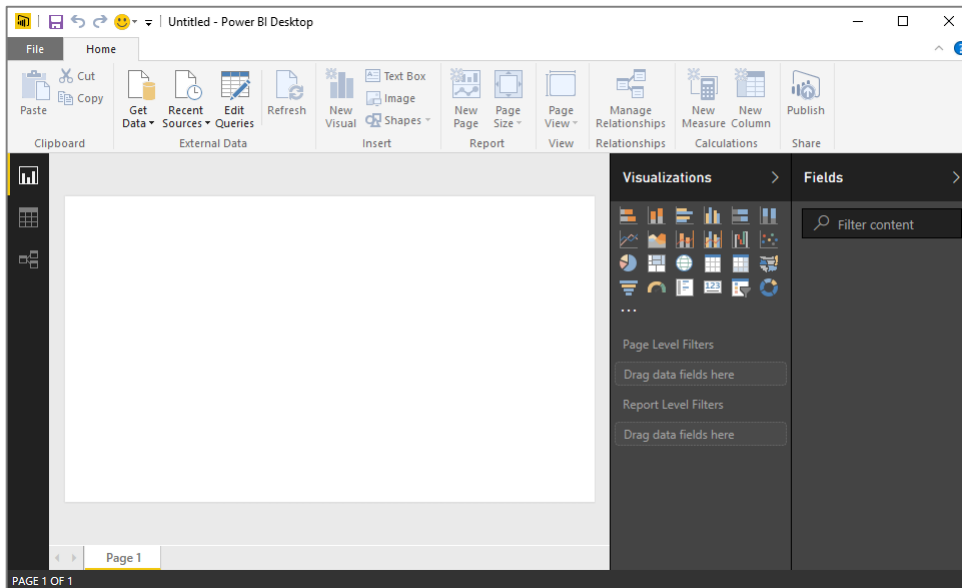
9. When you see the **Completed the Microsoft Power BI Desktop Setup Wizard** screen, click **Finish** to launch Power BI Desktop.



10. When Power BI Desktop launches for the first time, it displays a Welcome screen as shown in the following desktop. Click the (X) button in the upper right corner to close this window.



11. At this point, you should have Power BI Desktop running as shown in the following screenshot. You are now ready to move ahead to the next exercise.

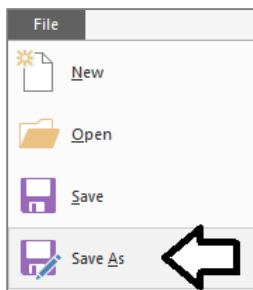


Exercise 2: Importing Data into Power BI Desktop using Power Query

In this exercise you will use Power BI Desktop to import sales data from three separate CSV files. Moving through the steps of this exercise will give you a chance to begin working with the Power Query features that are built into Power BI Desktop.

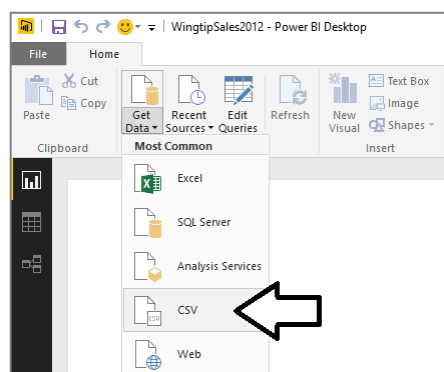
1. This lab is accompanied a zip file named **PowerBiLas.zip** which contains three CSV files named **Customers.csv**, **Invoices.csv** and **InvoiceDetails.csv**. Copy these files to a local folder so you can import them with Power Query later in this lab.
 - a) Using Windows Explorer, create a new folder at the following path.

C:\PowerBiLab
 - b) Copy **Customers.csv**, **Invoices.csv** and **InvoiceDetails.csv** into the new folder.
2. Open Power BI Desktop if it is not already open.
3. Power BI Desktop should now be open with a new and empty project.
4. Before beginning your work, save the empty project as a PBIX file.
 - a) Drop down the **File** menu and click the **Save As** command.

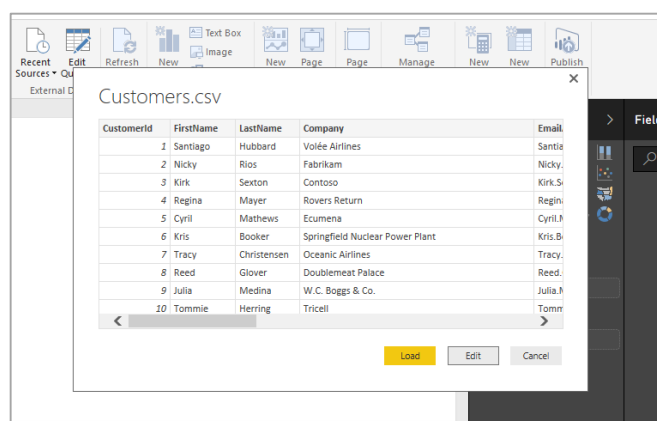


- b) Save the PBIX file as **WingtipSales2012.pbix** using a location on your local hard drive such as the following path.

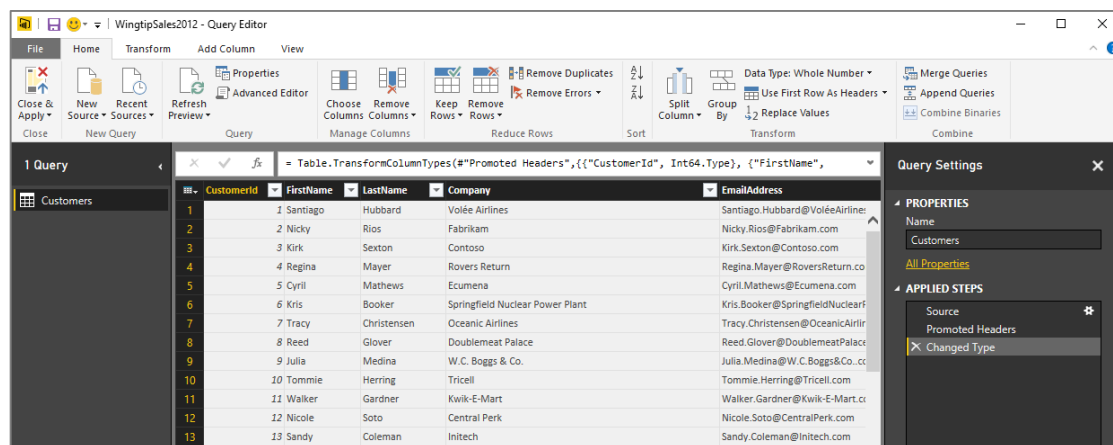
C:\PowerBiLab\wingtipSales2012.pbix
 - c) Click the **Save** button on the **Save As** dialog to save the PBIX file.
5. Return to Power BI Desktop and examine the ribbon. Drop down the **Get Data** menu button and select the **CSV** command.



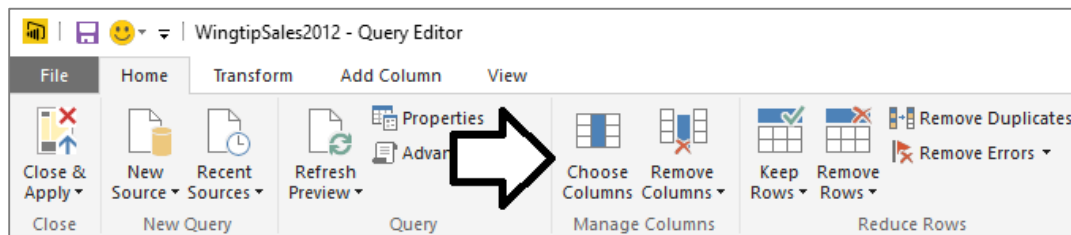
6. In the **Open** dialog, navigate to the folder at **C:\PowerBILab** and select the file named **Customers.csv**. Click the **Open** button in the bottom right of the dialog to begin the import process.
7. At this point you are presented with the **Customers.csv** dialog which displays a **Load** button, an **Edit** button and a **Cancel** button. Click the **Edit** button to view the data from **Customers.csv** in the Power Query Editor window.



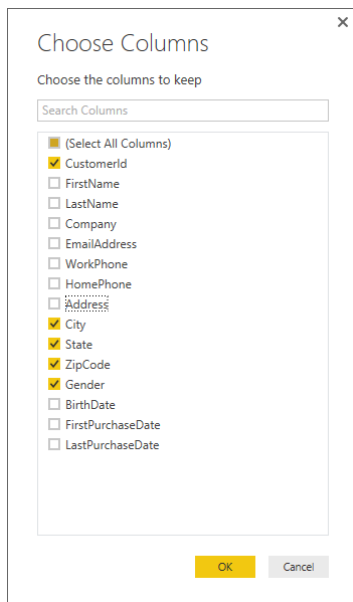
8. You should now be looking at the data from **Customers.csv** in the Query Editor window as shown in the following screenshot. If you examine the **Query Settings** task pane on the right-hand side, you can see that the query is named **Customers** and there are three steps in the **Applied Steps** list.



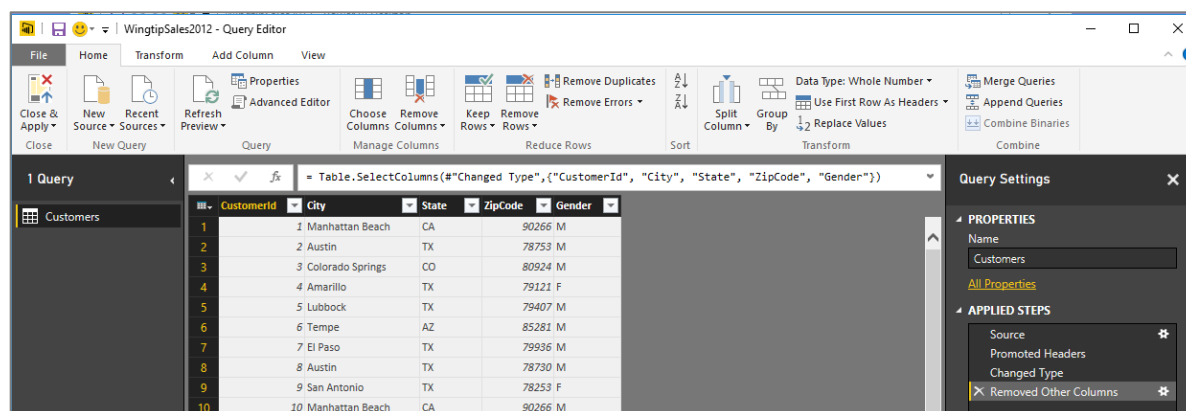
9. The **Customers** query contains several unneeded columns that will not be used to analyze sales data. In this step you will remove these unneeded columns to reduce the amount of data that is loaded into the data model.
 - a) In the ribbon of the **Query Editor** window, click the **Choose Columns** button.



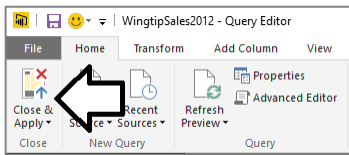
- b) In the **Choose Columns** dialog, begin by unselecting all columns.
- c) Select the columns named **CustomerId**, **City**, **State**, **ZipCode** and **Gender** as shown in the following dialog.



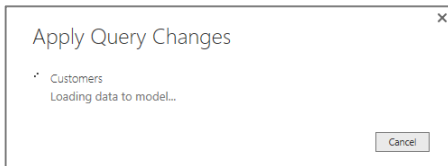
10. Once you have selected the desired columns, click the **OK** button to close the **Choose Columns** dialog. You should be able to observe that the Query Editor window now displays data for the columns you selected.



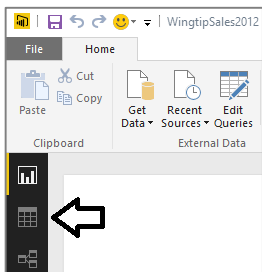
11. Now it's time to load the data from **Customer.csv** into the data model. Accomplish this by clicking the **Close & Apply** button in the ribbon of the Query Editor window to close the Query Editor window and import the data.



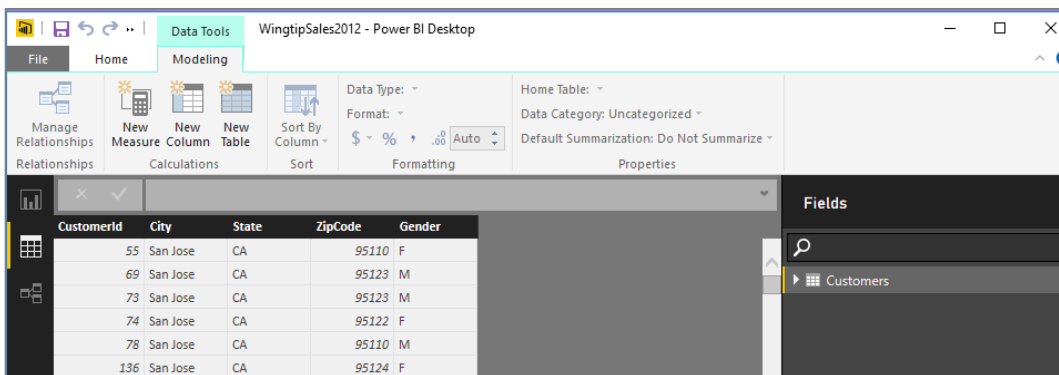
12. Power BI Desktop displays the **Apply Query Changes** dialog while it's executing the query and importing the data. Note that the **Apply Query Changes** dialog will close automatically after the data has been imported.



13. You should now be looking at the main window of Power BI Desktop in report view which displays a new and empty report. Locate the three buttons on the sidebar on the left-hand side of the screen. Click the button in the middle to move from report view to data view.



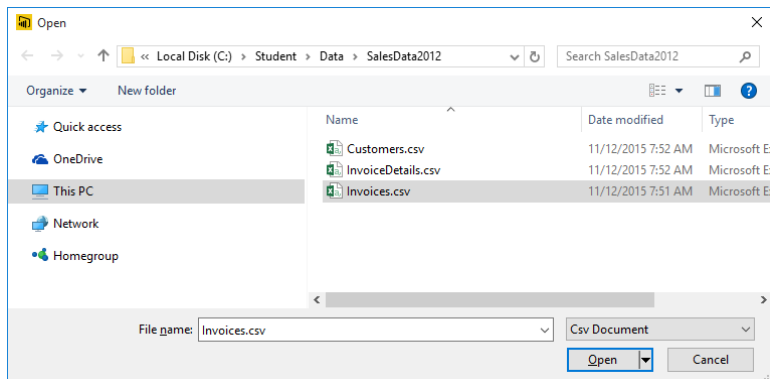
14. Once you have moved over to data view, you should be able to verify that the **Customers** table has been created. On the right side of the window, the **Fields** list shows the **Customers** table which is selected. The data from the **Customers** table is shown in a grid view in the middle of the screen.



You might observe that the data from the **Customers** table is not sorted in an intuitive fashion. For example, you might expect the default sort order to be the same as the underlying CSV file which orders customers by **CustomerId**. Instead, the table has a seemingly random sort order which is a side effect of the way data is stored in memory given the column-based nature of the tabular model. You can right-click the column header for the **CustomerId** column and run a command to sort the data in the table if it makes you feel better, but this action will not really have any effect because changes to the sort order are only temporary and they are not saved as part of the underlying data model.

15. You have imported one table into the data model. Now you will import a second table to get additional data on invoices.
- In the Ribbon of the Power BI Desktop window, select the **Home** tab.
 - Drop down the **Get Data** menu button and select the **CSV** command.

- c) In the **Open** dialog, navigate to the folder at **C:\Student\Data\SalesData2012** and select the file named **Invoices.csv**.



- d) Click the **Open** button in the bottom right of the dialog to begin the import process.
e) In the **Invoices.csv** dialog, click the **Load** button to execute the query and import data to create the **Invoices** table.

Invoices.csv

InvoiceId	InvoiceDate	InvoiceAmount	InvoiceType	CustomerId
1	1/28/2012	149.75	InPerson	1
2	1/28/2012	59.9	InPerson	2
3	1/28/2012	489.3	InPerson	3
4	1/28/2012	2.95	InPerson	4
5	1/28/2012	159.6	InPerson	5
6	1/28/2012	82.3	InPerson	6
7	1/29/2012	219.4	InPerson	7
8	1/29/2012	103.6	InPerson	8
9	1/29/2012	17.7	InPerson	9
10	1/29/2012	20.65	InPerson	10
11	1/29/2012	95.6	InPerson	11

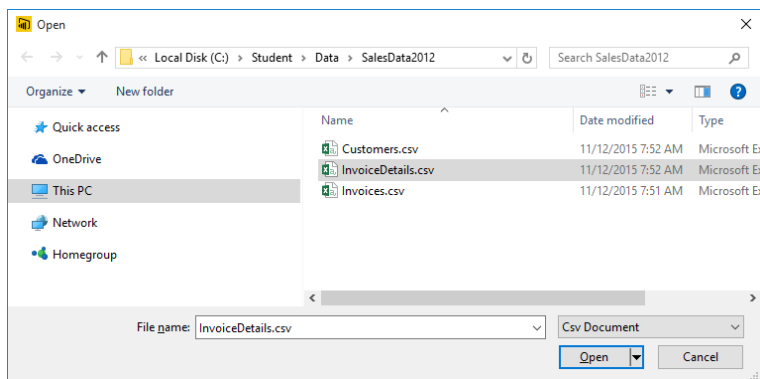
Load Edit Cancel

- f) Make sure Power BI Desktop is in data view. You should be able to verify that the **Invoices** table has been created.

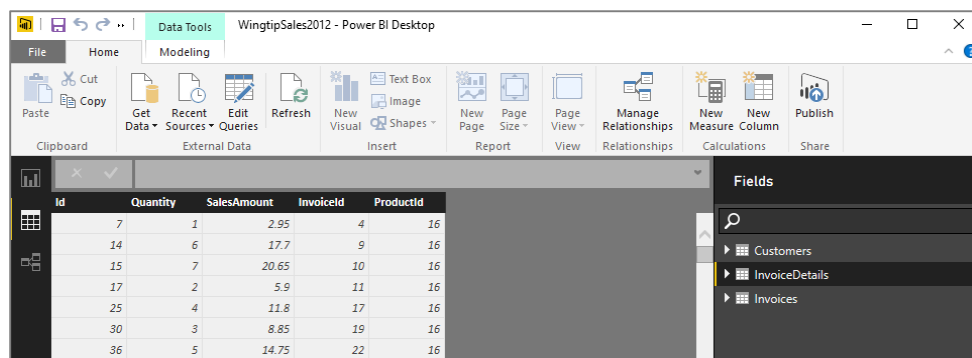
InvoiceId	InvoiceDate	InvoiceAmount	InvoiceType	CustomerId
1	Saturday, January 28, 2012	149.75	InPerson	1
2	Saturday, January 28, 2012	59.9	InPerson	2
3	Saturday, January 28, 2012	489.3	InPerson	3
4	Saturday, January 28, 2012	2.95	InPerson	4
5	Saturday, January 28, 2012	159.6	InPerson	5
6	Saturday, January 28, 2012	82.3	InPerson	6

16. Now, you will import one more table into the data model.

- a) In the ribbon of the Power BI Desktop window, select the **Home** tab.
b) Drop down the **Get Data** menu button and select the **CSV** command.
c) In the **Open** dialog, navigate to the folder at **C:\Student\Data\SalesData2012** and select the file named **InvoiceDetails.csv**.

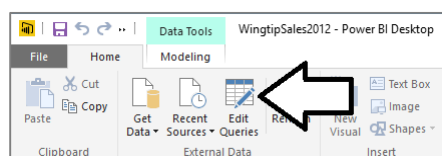


- d) Click the **Open** button in the bottom right of the dialog to begin the import process.
- e) In the **InvoiceDetails.csv** dialog, click **Load** to execute the query and import data to create the **InvoiceDetails** table.
- f) After the import process completes, you should be able to verify that the **InvoiceDetails** table has been created.

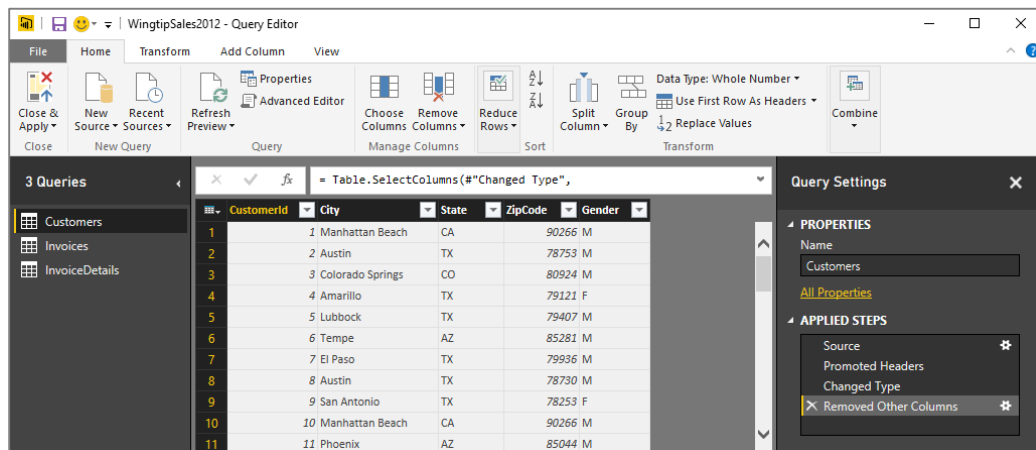


17. While you are done working with the query and data import aspects of Power BI Desktop for this particular lab exercise, it's still important that you know how to open and edit queries whenever it is required. You will now go through the steps to open the Query Editor window to see how to get back to query editing mode.

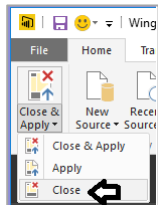
- a) In the ribbon of the Power BI Desktop window, click the **Edit Queries** button to open the Query Editor window.



- b) You should now see the Query Editor window displaying queries named **Customers**, **Invoices** and **InvoiceDetails** in the **Queries** list in the right-hand side of the screen. You can select any of these queries and continue to edit them if required. However, in this case there is no need to edit the queries any more.



- c) Close the Query Editor window by dropping down the **Close and Apply** menu button and clicking the **Close** command.



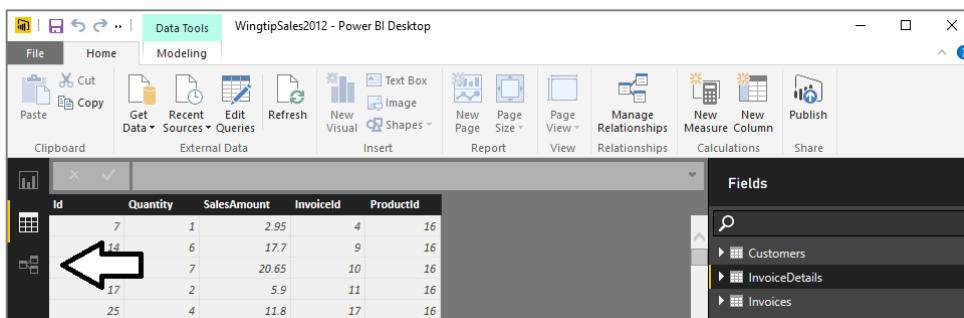
18. Save your work by clicking the Save button on the top left of the Power BI Desktop window.

You have now finished importing data into your data model using Power Query. The next step is to begin modeling the data using the Power Pivot features of Power BI Desktop.

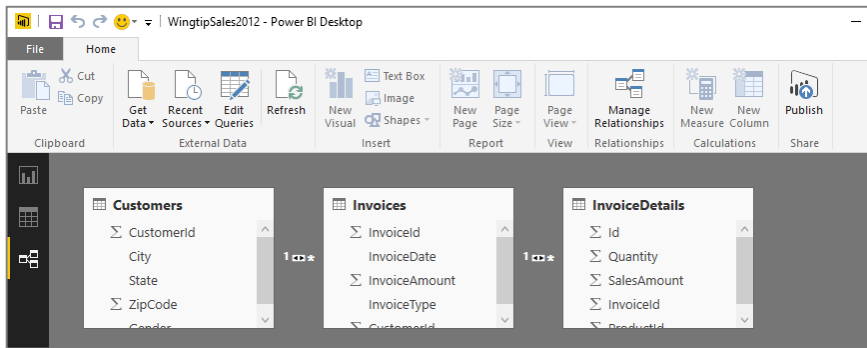
Exercise 3: Modeling Tables in a Dataset using Power Pivot

In this exercise you will begin to model the data in the dataset you have created using the Power Pivot features of Power BI Desktop. You will begin by ensuring the appropriate relationships have been created between the three tables in the data model. After that, you will extend the tables within the data model by adding calculated columns and measures.

1. Currently, the Power BI Desktop window should be displaying in data view. Click on the bottom button in the sidebar on the left-hand side of the screen to move to relationship view.

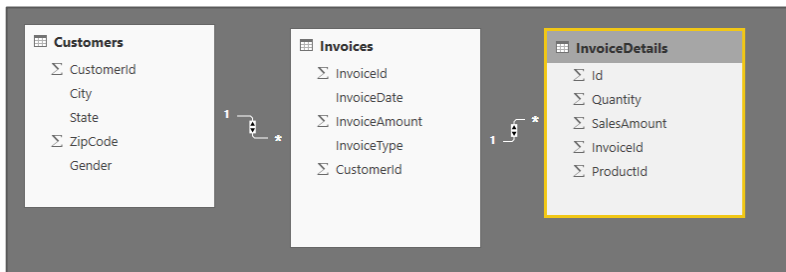


2. Once you navigate to relationship view, you should be able to see all three tables as shown in the following screenshot.

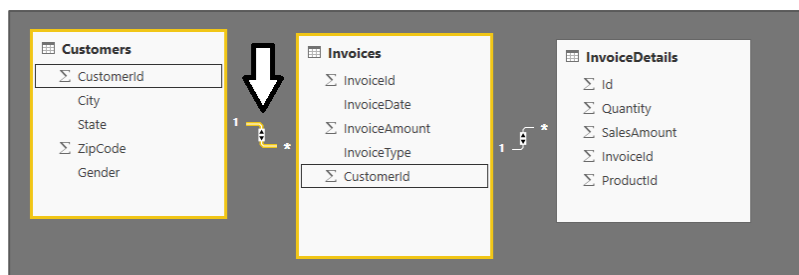


Note that Power BI desktop automatically created relationships between these tables because it determined that the **Customers** table and **Invoices** table both contain a common field named **CustomerId** and also that the **Invoices** tables and the **InvoiceDetails** table both contain a common field named **InvoiceId**.

3. Using the mouse, resize each of the three tables in relationship view so you can see all the fields in each one. Also space the tables out a bit so it is easier to see the relationships between them. You can see that these relationship are displayed using a line that starts with a 1 and end with a (*) to indicate a one-to-many relationship.



4. Take a moment to inspect the relationships that have been created.
 - a) Click on the line that represents the relationship between the **Customers** table and the **Invoices** table. Once the relationship has been selected, you can see that the **CustomerId** field in each table becomes highlighted to indicate that those are the two fields used to define the one-to-many relationship.



- b) Now, double-click on the line that represents the relationship between the **Customers** table and the **Invoices** table to display the **Edit Relationship** dialog. There is no need to change anything as you are just observing. Once you have seen what's inside this dialog, click the **OK** button to close it.

Edit Relationship

Select tables and columns that relate to one another.

Invoices

InvoiceId	InvoiceDate	InvoiceAmount	InvoiceType	CustomerId
1	Saturday, January 28, 2012	149.75	InPerson	1
2	Saturday, January 28, 2012	59.9	InPerson	2
3	Saturday, January 28, 2012	489.3	InPerson	3
4	Saturday, January 28, 2012	2.95	InPerson	4
5	Saturday, January 28, 2012	159.6	InPerson	5

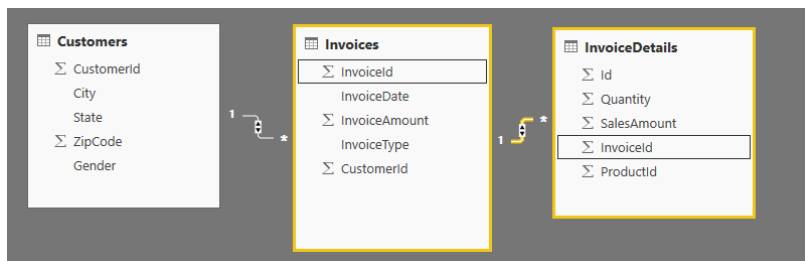
Customers

CustomerId	City	State	ZipCode	Gender
55	San Jose	CA	95110	F
69	San Jose	CA	95123	M
73	San Jose	CA	95123	M
74	San Jose	CA	95122	F
78	San Jose	CA	95110	M

Advanced options

OK Cancel

- c) Click on the line that represents the relationship between the **Invoices** table and the **InvoiceDetails** table. When you do, you can see that the **InvoiceId** field in each table becomes highlighted to indicate that those are the two fields used to define the one-to-many relationship.



- d) Now, double-click on the line that represents the relationship between the **Invoices** table and the **InvoiceDetails** table to display the **Edit Relationship** dialog. Once you have seen the dialog, click the **OK** button to close the dialog.

Edit Relationship

Select tables and columns that relate to one another.

InvoiceDetails

Id	Quantity	SalesAmount	InvoiceId	ProductId
7	1	2.95	4	16
14	6	17.7	9	16
15	7	20.65	10	16
17	2	5.9	11	16
25	4	11.8	17	16

Invoices

InvoiceId	InvoiceDate	InvoiceAmount	InvoiceType	CustomerId
1	Saturday, January 28, 2012	149.75	InPerson	1
2	Saturday, January 28, 2012	59.9	InPerson	2
3	Saturday, January 28, 2012	489.3	InPerson	3
4	Saturday, January 28, 2012	2.95	InPerson	4
5	Saturday, January 28, 2012	159.6	InPerson	5

Advanced options

OK Cancel

5. Modify the formatting on the **InvoiceDate** field of the **Invoices** table.
 - a) Navigate back to data view and select the **Invoices** table from the **Fields** list.

InvoiceId	InvoiceDate	InvoiceAmount	InvoiceType	CustomerId
1	Saturday, January 28, 2012	149.75	InPerson	1
2	Saturday, January 28, 2012	59.9	InPerson	2
3	Saturday, January 28, 2012	489.3	InPerson	3
4	Saturday, January 28, 2012	2.95	InPerson	4
5	Saturday, January 28, 2012	159.6	InPerson	5

- b) Select the **InvoiceDate** column by clicking its column header.
 - c) Drop down the **Format** menu in the ribbon and select the date format of **3/14/2001 (M/d/yyyy)**.

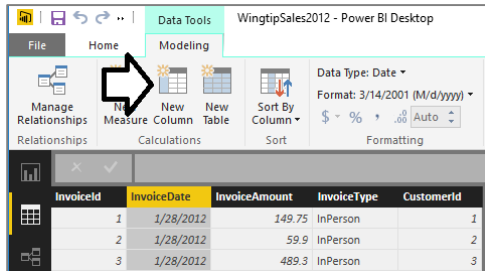
The screenshot shows the Power BI Desktop interface with the **InvoiceDate** column selected. The **Format** menu is open, and the date format **3/14/2001 (M/d/yyyy)** is selected. The data in the **InvoiceDate** field is now displayed in the new format.

- d) The data in the **InvoiceDate** field should now be display in the new format.

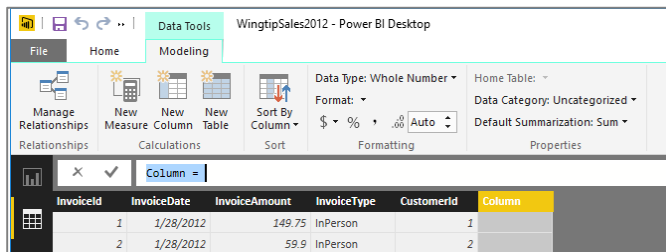
InvoiceId	InvoiceDate	InvoiceAmount	InvoiceType	CustomerId
1	1/28/2012	149.75	InPerson	1
2	1/28/2012	59.9	InPerson	2
3	1/28/2012	489.3	InPerson	3
4	1/28/2012	2.95	InPerson	4
5	1/28/2012	159.6	InPerson	5
6	1/28/2012	82.3	InPerson	6
7	1/29/2012	219.4	InPerson	7

6. Add a new calculated column to the **Invoice** table to display the current month.

a) Click the **New Column** button in the ribbon to create a new column.



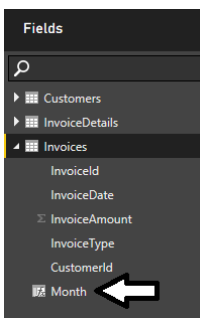
b) The column is initially created with a generic name of **Column** and it has no formula in the formula bar.



c) Give the new column a name of **Month** and provide a DAX formula for determining the month from the **InvoiceDate** column by replacing what's inside the formula bar with the following text. When you are done typing the formula, press the **Enter** key.

Month = FORMAT(Invoices[InvoiceDate], "MMM yyyy")

d) At this point, you should be able to see the **Month** column in the **Fields** list. Note that the **Month** column is displayed with a special function icon (i.e. **Fx**) to indicate that it is a calculated column.



Now that you have created the **Month** column, you will be able to use it to display data on reports that is broken out by month. However, this can cause a sorting issue because month names will be sorted alphabetically by default. For example, February will be sorted before January which will cause confusion and produce strange results. In the next step you will create an extra column that will be used assist in sorting the Month column in a chronologic fashion which is what people expect.

7. Create an additional calculated column named **MonthSort** to supply the proper sorting behavior for the **Month** column.
 - a) Click the **New Column** button in the ribbon to create a new column.
 - b) Give the new column a name of **MonthSort** and use the following DAX formula.

```
MonthSort = Format(Invoices[InvoiceDate], "yyyyMM")
```

- c) Once you add the **MonthSort** column, you should be able to see it on the **Fields** list. You should also be able to see that the data in the **MonthSort** column contains a sortable text value which concatenates a 4-digit year value together with the 2-digit month value.

InvoiceId	InvoiceDate	InvoiceAmount	InvoiceType	CustomerId	Month	MonthSort
1	1/28/2012	149.75	InPerson		1 Jan 2012	201201
2	1/28/2012	59.9	InPerson		2 Jan 2012	201201
3	1/28/2012	489.3	InPerson		3 Jan 2012	201201
4	1/28/2012	2.95	InPerson		4 Jan 2012	201201
5	1/28/2012	159.6	InPerson		5 Jan 2012	201201
6	1/28/2012	82.3	InPerson		6 Jan 2012	201201
7	1/29/2012	219.4	InPerson		7 Jan 2012	201201
8	1/29/2012	103.6	InPerson		8 Jan 2012	201201
9	1/29/2012	17.7	InPerson		9 Jan 2012	201201
10	1/29/2012	20.65	InPerson		10 Jan 2012	201201
11	1/29/2012	95.6	InPerson		11 Jan 2012	201201
12	1/29/2012	64.8	InPerson		12 Jan 2012	201201
13	1/29/2012	69.65	InPerson		13 Jan 2012	201201
14	1/29/2012	39.9	InPerson		14 Jan 2012	201201

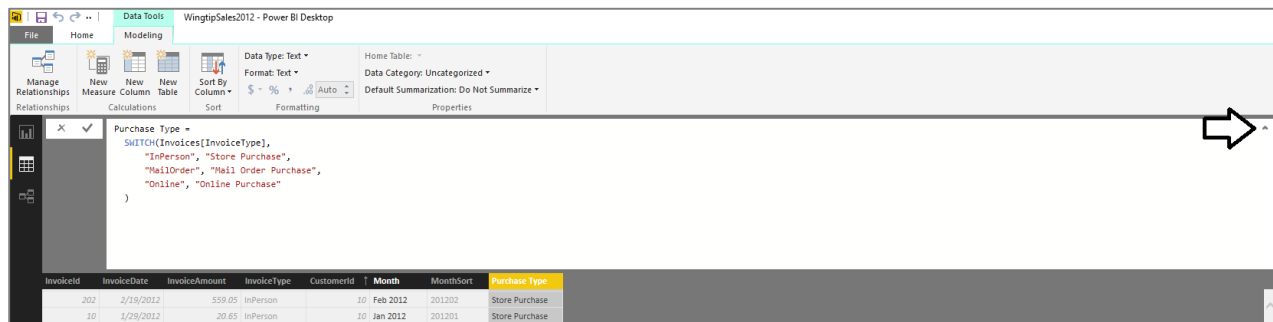
- d) Now it is time to configure the **Month** column to use **MonthSort** as its sort column. Begin by clicking on the column header of the **Month** column to select it. Next, drop down the **Sort By Column** button and select the **MonthSort** column.

InvoiceId	InvoiceDate	InvoiceAmount	InvoiceType	CustomerId	Month	MonthSort
1	1/28/2012	149.75	InPerson		1 Jan 2012	201201
2	1/28/2012	59.9	InPerson		2 Jan 2012	201201
3	1/28/2012	489.3	InPerson		3 Jan 2012	201201
4	1/28/2012	2.95	InPerson		4 Jan 2012	201201
5	1/28/2012	159.6	InPerson		5 Jan 2012	201201
6	1/28/2012	82.3	InPerson		6 Jan 2012	201201
7	1/29/2012	219.4	InPerson		7 Jan 2012	201201
8	1/29/2012	103.6	InPerson		8 Jan 2012	201201

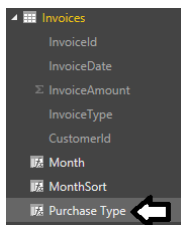
8. Create a calculated column named **Purchase Type** to provide a more human readable value for the **InvoiceType** column.
 - a) Click the **New Column** button in the ribbon to create a new column.
 - b) Given the new column a name of **Purchase Type** using the following formula.

```
Purchase Type =
SWITCH(Invoices[InvoiceType],
    "InPerson", "Store Purchase",
    "MailOrder", "Mail Order Purchase",
    "Online", "Online Purchase"
)
```

- c) Note that you can expand the height of the formula bar by clicking the downward facing button on the right-hand side. This will make it much easier to write multi-line DAX expressions which are far more readable and also more maintainable. Also remember that you can add a line break into a DAX formula by holding down the **SHIFT** key and then pressing the **ENTER** key. Once you have typed in the DAX formula for the **Purchase Type** field, press the **Enter** key.



- d) At this point, you should be able to see the **Purchase Type** column in the **Fields** list.

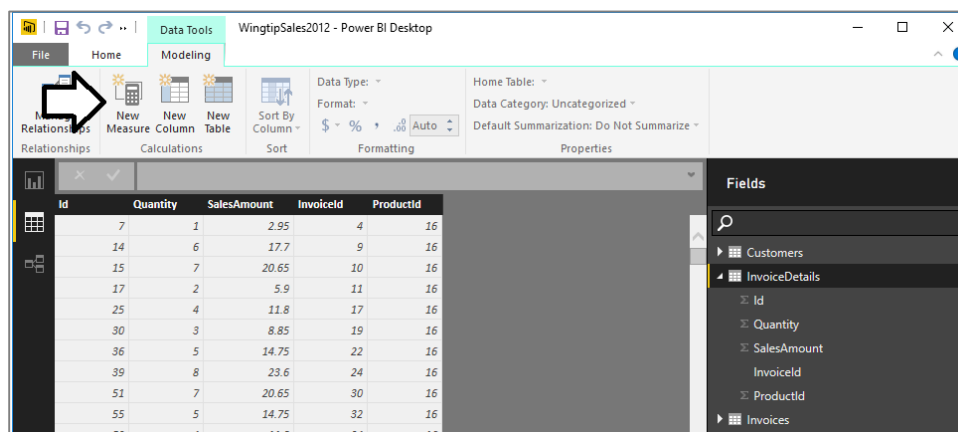


- e) Inspect the values in the **Purchase Type** column to see the effect of the DAX formula you have written.

InvoiceId	InvoiceDate	InvoiceAmount	InvoiceType	CustomerId	Month	MonthSort	Purchase Type
5220	12/31/2012	25.85	InPerson	2653	Dec 2012	201212	Store Purchase
5219	12/31/2012	319.3	InPerson	2652	Dec 2012	201212	Store Purchase
5218	12/31/2012	162.6	InPerson	2651	Dec 2012	201212	Store Purchase
5217	12/31/2012	183.6	InPerson	2650	Dec 2012	201212	Store Purchase
5216	12/31/2012	114.6	InPerson	2649	Dec 2012	201212	Store Purchase
5215	12/31/2012	59.8	InPerson	2648	Dec 2012	201212	Store Purchase
5214	12/31/2012	41.8	InPerson	2647	Dec 2012	201212	Store Purchase

9. Add a measure to the **InvoiceDetails** table to calculate total sales revenue.

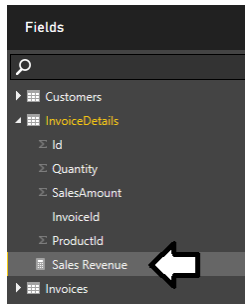
- Select the **InvoiceDetails** table by clicking on it in the **Fields** list.
- Click the **New Measure** button in the ribbon to create a new measure.



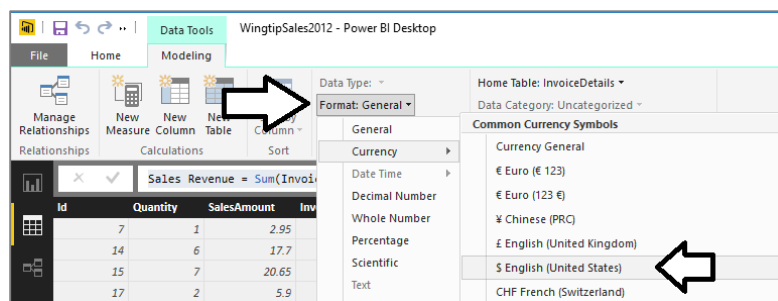
- Create a new measure named **Sales Revenue** using the following DAX formula. Once you have typed the formula into the formula bar, press the **Enter** key to create the new measure.

Sales Revenue = Sum(InvoiceDetails[SalesAmount])

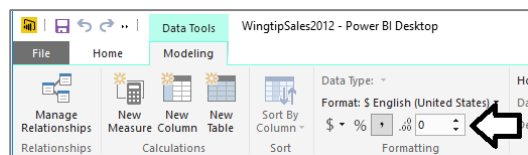
- d) At this point you should be able to see the **Sales Revenue** measure in the **InvoiceDetails** table in the **Fields** list. Note that the **Sales Revenue** field is displayed with a special calculator icon to indicate that it is a measure.



- e) Make sure the **Sales Revenue** measure is still selected in the **Fields** list. Modify the formatting of this measure by dropping down the **Format** menu on the ribbon and selecting a format type of **Currency > English (United States)**.



- f) Enhance the formatting of the **Sales Revenue** column by reducing the number of decimal places shown from **2** to **0**.

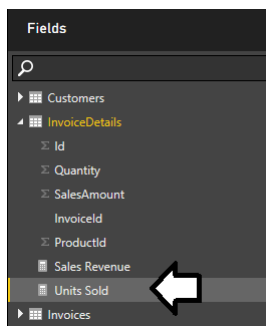


10. Create a second measure in the **InvoiceDetails** table to calculate the total number of units sold.

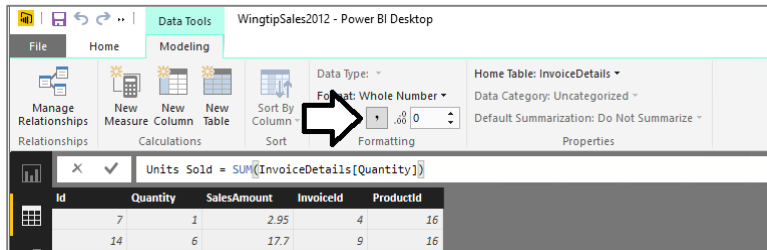
- a) Click the **New Measure** button in the ribbon to create a new measure.
b) Create a new measure named **Units Sold** using the following DAX formula. Once you have type the formula into the formula bar, press the **Enter** key to create the new measure.

```
Units Sold = SUM(InvoiceDetails[Quantity])
```

- c) You should be able to see the new **Units Sold** measure in the **Fields** list.



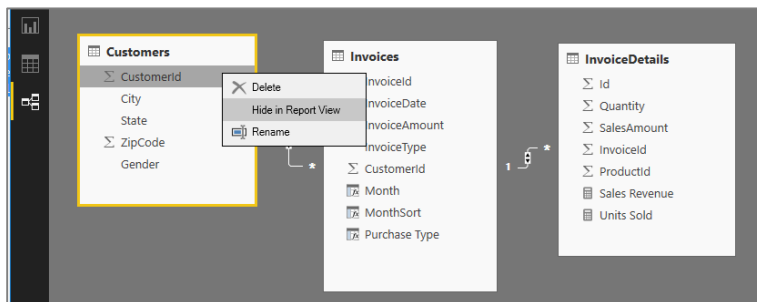
- d) Make sure the **Units Sold** measure is selected in the **Fields** list and modify the formatting by clicking and selecting the button on the ribbon with the comma which adds a thousands separator so larger numbers are formatted with commas (e.g. 2,500).



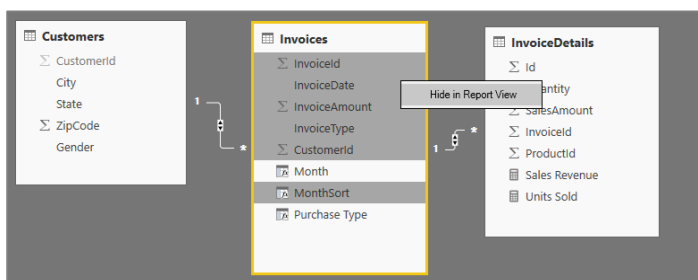
You are now done adding calculated columns and measures. You will now complete you modeling work by hiding fields that do not need to be seen when designing reports.

11. Hide all the fields that are not needed when designing reports.

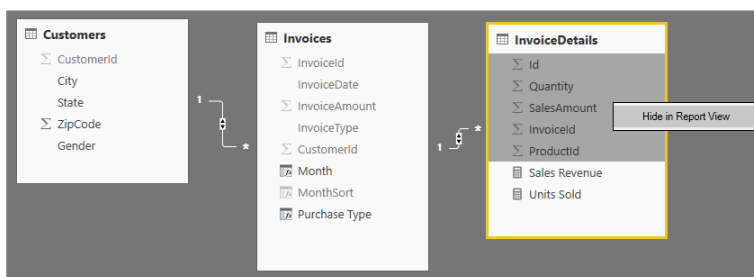
- a) Navigate to relationship view.
b) Right-click on the **CustomerId** field in the **Customers** table and click the **Hide in Report View** command.



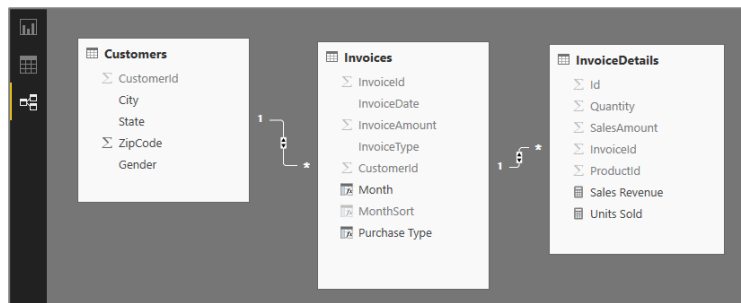
- c) Hold down the **Ctrl** key and select all the fields in the **Invoices** table except for the **Month** column and the **Purchase Type** column. Once you have the correct fields selected, right-click the selection and then click the **Hide in Report View** command.



- d) Hold down the **Ctrl** key and select all the fields in the **InvoiceDetails** table except for the **Sales Revenue** measure and the **Units Sold** measure. Once you have the correct fields selected, right-click the selection and then click the **Hide in Report View** command.



- e) The tables in relationship view should appear as they do in the following screenshot. You are now done modeling the data.

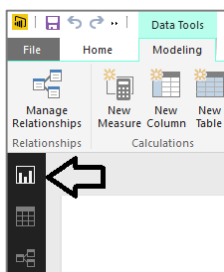


12. Save your work by clicking the **Save** button on the top left of the Power BI Desktop window.

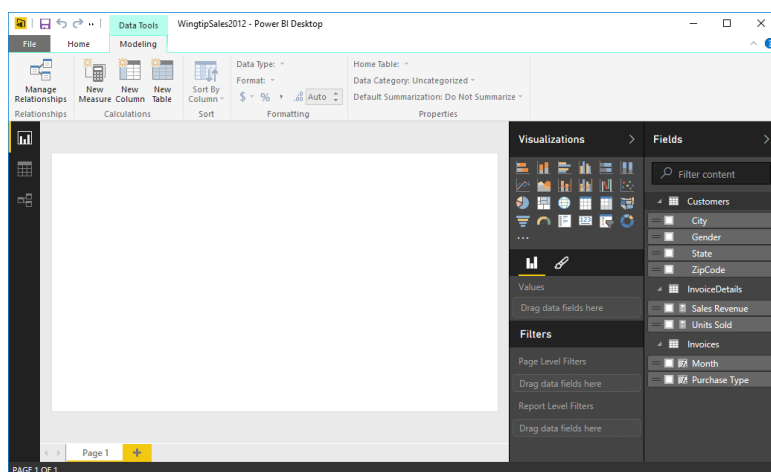
Exercise 4: Create a Report using Power BI Desktop

In this exercise you will design a report with two pages of visualizations using the data model you created in the previous exercise.

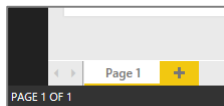
1. Make sure you still have the **Wingtipsales2012.pbix** file open that you created in the previous exercise.
2. Click on the top bottom in the sidebar to place Power BI Desktop into report view.



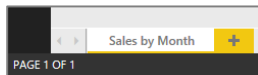
3. At this point, you should see the default report which contain an empty page named **Page 1**.



4. Change the title of the report's one and only page.
 - a) Locate page title with a default value of **Page 1** on the bottom left corner of the report and double-click on it to edit its value.

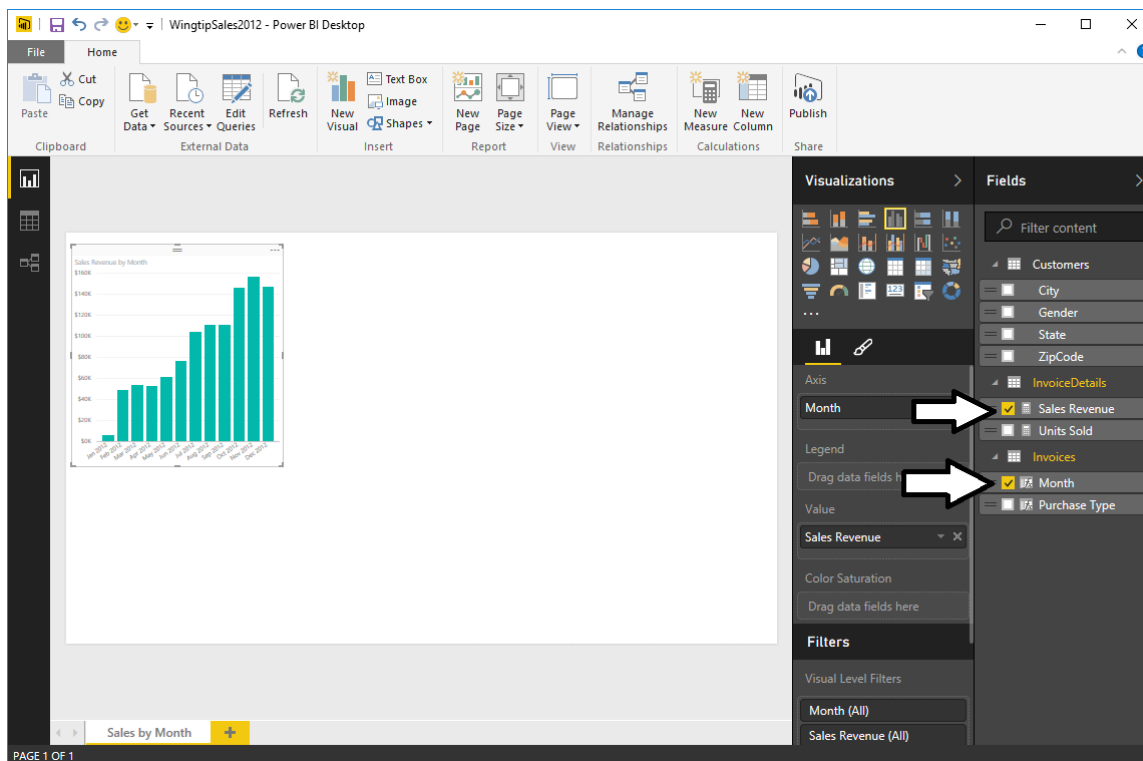


- b) Modify the page title to **Sales by Month** and press the **Enter** key to enter your changes

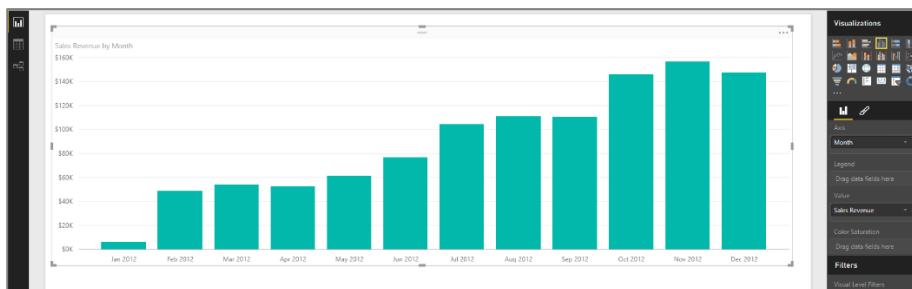


5. Add a new visualization to display sales revenue by month.

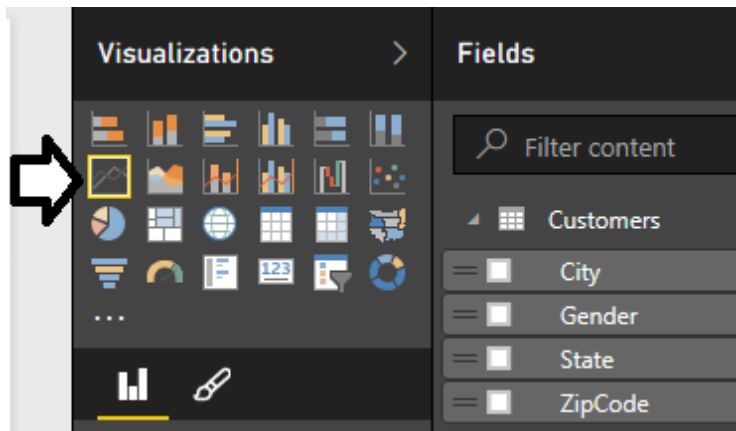
- a) At this point the **Sales by Month** page should be empty without any visualizations.
- b) In the **Fields** list, click the checkbox to select the **Sales Revenue** measure. Note that this action will add a new visualization to the page based on a clustered bar chart.
- c) Next, click the checkbox to select the **Month** column which will automatically add that column into the **Axis** well and produce a bar chart like the one shown in the following screenshot.



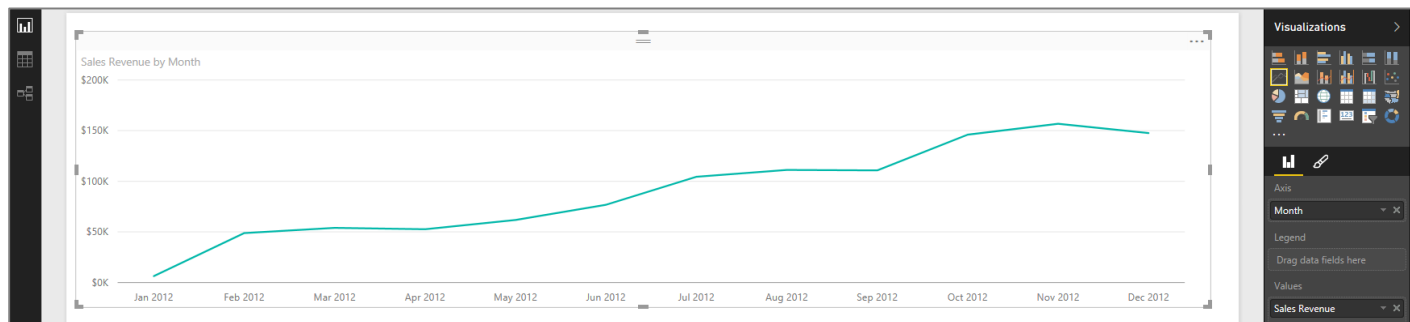
- d) Use the mouse to grab the lower right corner of the visualization and resize it so it takes up the full width of the page.



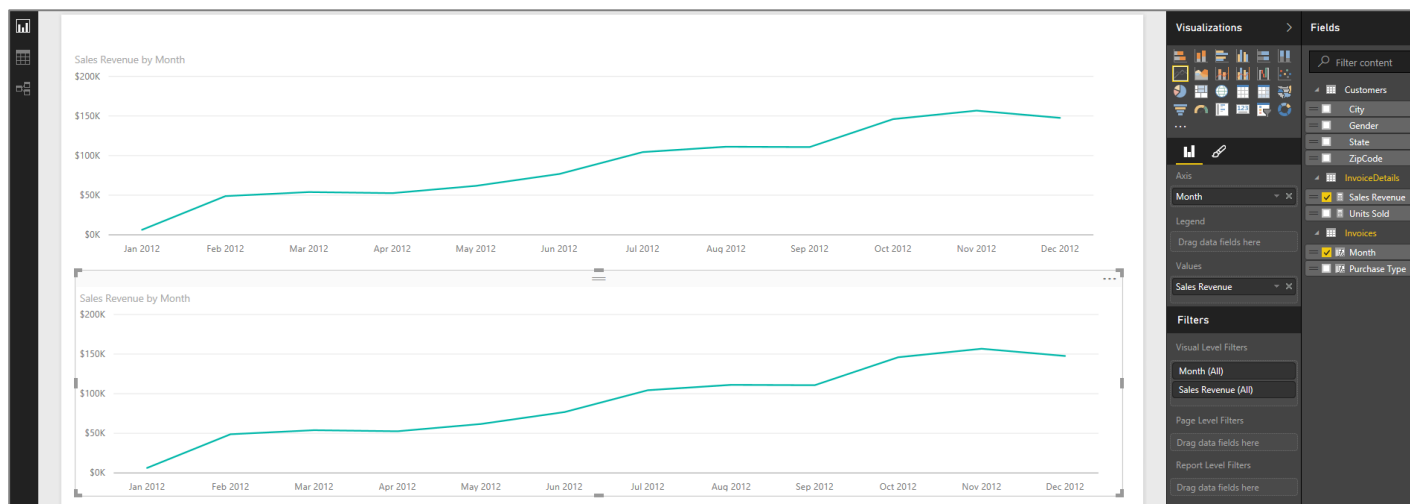
- e) Ensure that the visualization is still selected. Click the **Line Chart** button in the **Visualizations** list to change the visualization type to display it as a line chart.



- f) The visualization should now appear as a line chart like the one shown in the following screenshot.

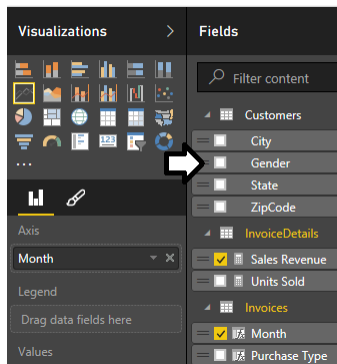


6. Create a second visualization to display sales revenue by month and gender.
- Select the visualization you created in the previous step and copy it to the Windows clipboard.
 - Use the Paste command to clone a copy of the first visualization.
 - Use the mouse to move the second visualization so it appears under the first visualization.

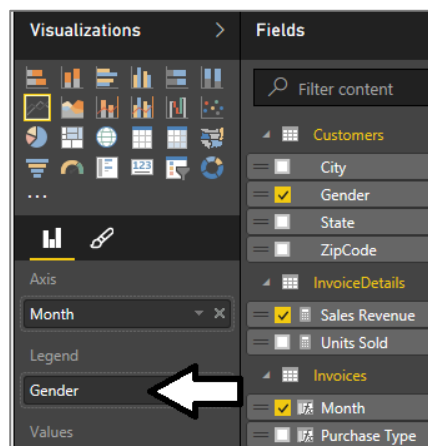


- d) Make sure the bottom visualization is selected.

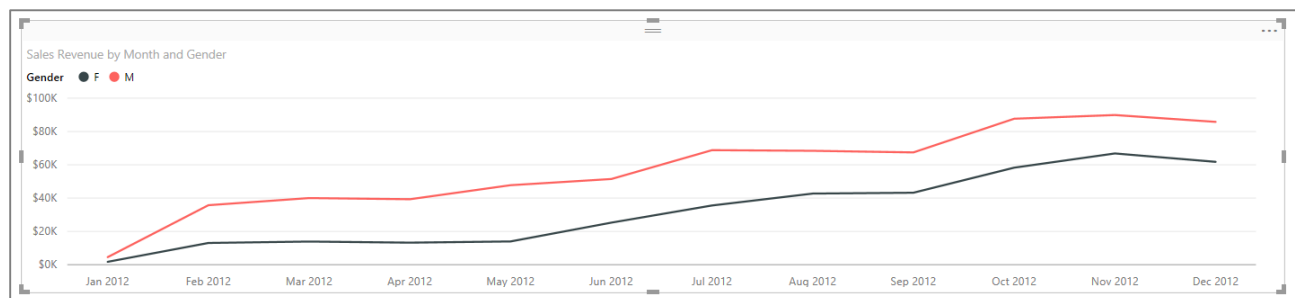
- e) Locate the **Gender** field in the **Fields** list.



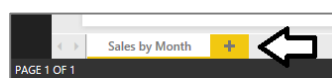
- f) Using the mouse, drag the **Gender** field from the **Fields** list and drop it into the **Axis** well in the **Visualizations** pane.



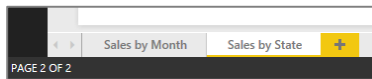
- g) The bottom visualization should now appear as the one shown in the following screenshot.



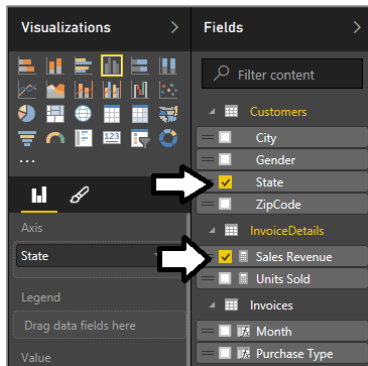
7. Save your work by clicking the **Save** button on the top left of the Power BI Desktop window.
8. Add a second page to the report.
- a) Click the (+) button in the bottom left corner of report view to add a second page to the report.



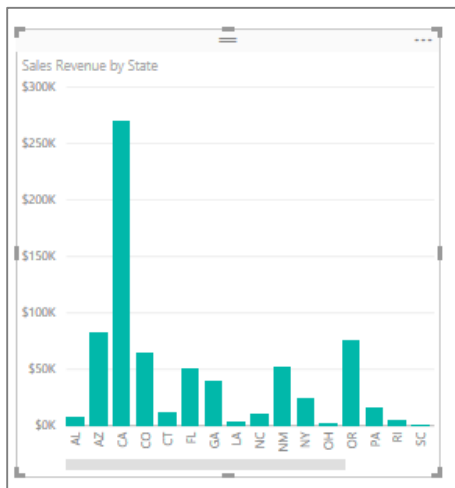
- b) Once the page has been created, modify its title to **Sales by States**.



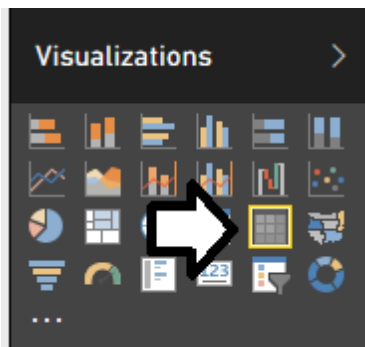
9. Add a new visualization to the **Sales by States** page to display numeric data in a matrix.
- In the **Fields** list, select the **Sales Revenue** measure to create a new clustered bar chart visualization.
 - Next, select the **State** column.



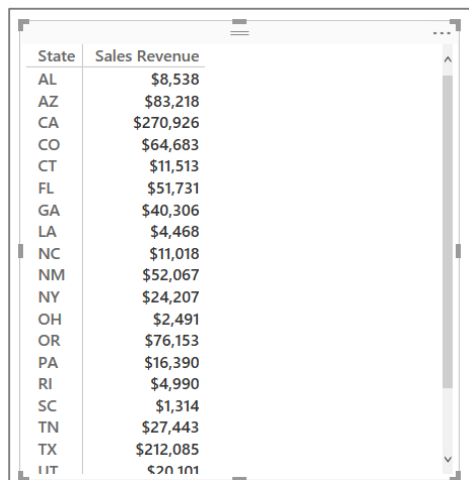
- c) At this point, your visualization should appear like the one shown in the following screenshot.



- d) Change the visualization type by clicking the **Matrix** button in the **Visualizations** list.

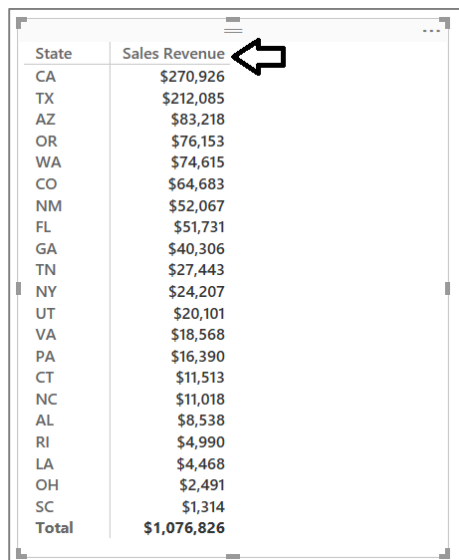


- e) The visualization should now display numeric data in a tabular format as shown in the following screenshot.



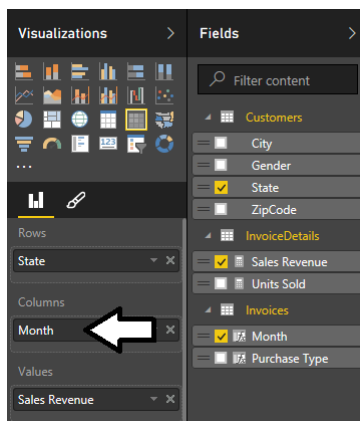
State	Sales Revenue
AL	\$8,538
AZ	\$83,218
CA	\$270,926
CO	\$64,683
CT	\$11,513
FL	\$51,731
GA	\$40,306
LA	\$4,468
NC	\$11,018
NM	\$52,067
NY	\$24,207
OH	\$2,491
OR	\$76,153
PA	\$16,390
RI	\$4,990
SC	\$1,314
TN	\$27,443
TX	\$212,085
UT	\$20,101

- f) Click on the column header of the **Sales Revenue** column to resort the rows within the visualization so that the states with the largest amounts of sales revenue are sorted towards the top.



State	Sales Revenue
CA	\$270,926
TX	\$212,085
AZ	\$83,218
OR	\$76,153
WA	\$74,615
CO	\$64,683
NM	\$52,067
FL	\$51,731
GA	\$40,306
TN	\$27,443
NY	\$24,207
UT	\$20,101
VA	\$18,568
PA	\$16,390
CT	\$11,513
NC	\$11,018
AL	\$8,538
RI	\$4,990
LA	\$4,468
OH	\$2,491
SC	\$1,314
Total	\$1,076,826

- g) In the **Fields** list, locate the **Month** column.
- h) Using the mouse, drag the **Month** field from the **Fields** list and drop it into the **Columns** well in the **Visualizations** pane.

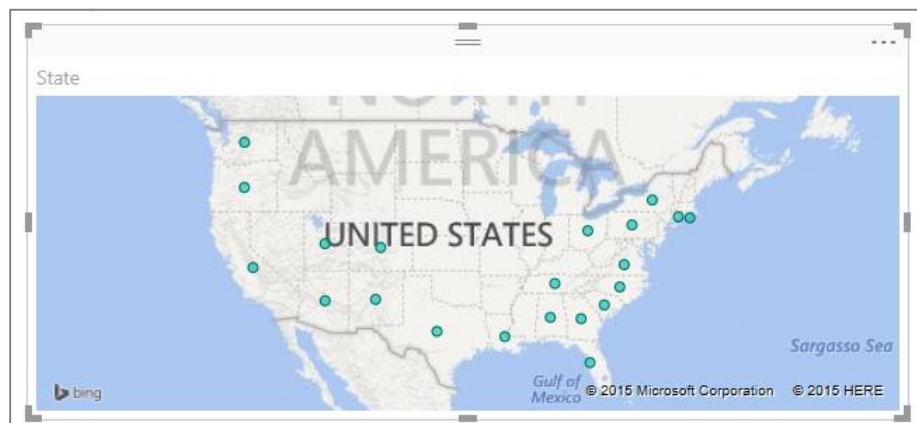


- i) You should now see the visualization expand to the right to display a column for each month.
- j) Using the mouse, resize the visualization to display all of its contents.

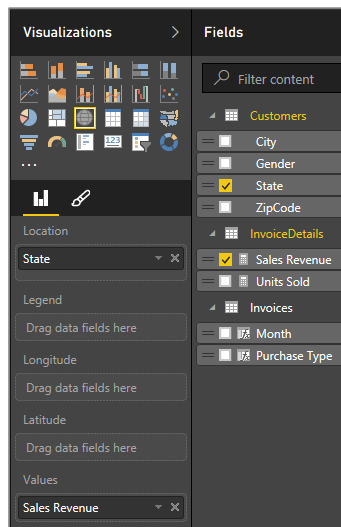
State	Jan 2012	Feb 2012	Mar 2012	Apr 2012	May 2012	Jun 2012	Jul 2012	Aug 2012	Sep 2012	Oct 2012	Nov 2012	Dec 2012	Total
CA	\$904	\$15,730	\$13,982	\$16,916	\$21,589	\$22,760	\$26,107	\$29,885	\$25,792	\$33,034	\$30,771	\$33,456	\$270,926
TX	\$2,461	\$10,623	\$12,719	\$10,644	\$13,772	\$14,397	\$18,225	\$19,249	\$23,331	\$28,530	\$31,221	\$26,913	\$212,085
AZ	\$1,575	\$4,280	\$5,528	\$5,186	\$3,912	\$6,259	\$7,685	\$7,163	\$9,506	\$9,678	\$12,221	\$10,227	\$83,218
OR	\$68	\$4,551	\$6,046	\$5,897	\$5,708	\$6,651	\$6,321	\$6,766	\$5,885	\$7,786	\$10,309	\$10,166	\$76,153
WA	\$394	\$4,165	\$7,696	\$7,151	\$6,535	\$7,897	\$6,430	\$7,003	\$5,891	\$9,523	\$5,180	\$6,750	\$74,615
CO	\$679	\$4,144	\$3,164	\$3,426	\$5,527	\$2,635	\$4,671	\$7,757	\$7,803	\$7,409	\$9,050	\$8,419	\$64,683
NM	\$225	\$1,598	\$3,437	\$1,918	\$3,389	\$5,285	\$7,840	\$3,404	\$5,995	\$9,391	\$4,921	\$4,664	\$52,067
FL						\$1,551	\$7,680	\$4,994	\$7,586	\$7,739	\$12,236	\$9,944	\$51,731
GA						\$1,579	\$6,209	\$5,952	\$3,540	\$7,307	\$9,335	\$6,384	\$40,306
TN						\$784	\$1,937	\$6,201	\$2,003	\$3,973	\$6,178	\$6,368	\$27,443
NY						\$1,508	\$1,290	\$3,519	\$4,061	\$2,736	\$5,490	\$5,603	\$24,207
UT		\$3,224	\$1,387	\$1,155	\$1,324	\$1,272	\$698	\$1,457	\$1,636	\$2,671	\$3,688	\$1,590	\$20,101
VA		\$499		\$309		\$1,157	\$1,841	\$1,666	\$1,841	\$4,197	\$4,554	\$2,504	\$18,568
PA						\$795	\$3,690	\$2,264	\$466	\$2,973	\$3,733	\$2,469	\$16,390
CT						\$1,047	\$1,282	\$1,251	\$565	\$1,399	\$3,037	\$2,932	\$11,513
NC						\$466	\$1,094	\$252	\$1,782	\$3,310	\$1,085	\$3,030	\$11,018
AL						\$316		\$465	\$949	\$1,329	\$2,015	\$3,464	\$8,538
RI							\$960	\$917	\$645	\$1,287	\$172	\$1,010	\$4,990
LA						\$399		\$691	\$445	\$553	\$1,555	\$824	\$4,468
OH							\$448	\$78	\$994	\$711		\$261	\$2,491
SC								\$236		\$464		\$614	\$1,314
Total	\$6,306	\$48,815	\$53,958	\$52,601	\$61,756	\$76,756	\$104,408	\$111,167	\$110,716	\$145,999	\$156,751	\$147,593	\$1,076,826

10. Add a second visualization to display a map visualization which shows how sales revenue is distributed across states.

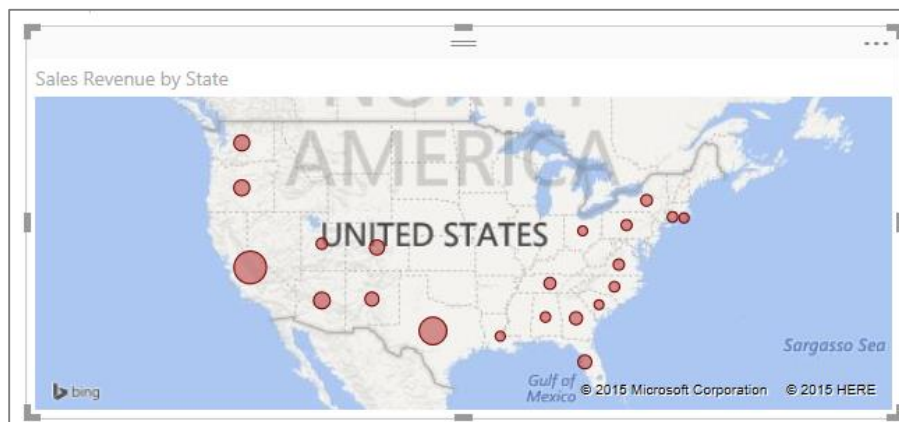
- a) Click on the white space below the matrix visualization to make sure no visualization is selected.
- b) Select the **State** column in the **Fields** list to create a new visualization. Note that Power BI Desktop recognizes the **State** column as a geographic field so it creates the new visualization using the **Map** visualization type.



- c) Using the mouse, drag the **Sales Revenue** measure from the **Fields** list into the **Values** well in the **Visualization** pane.



- d) The Map visualization should now show dots of different sizes to visually depict how sales revenue is distributed across states.



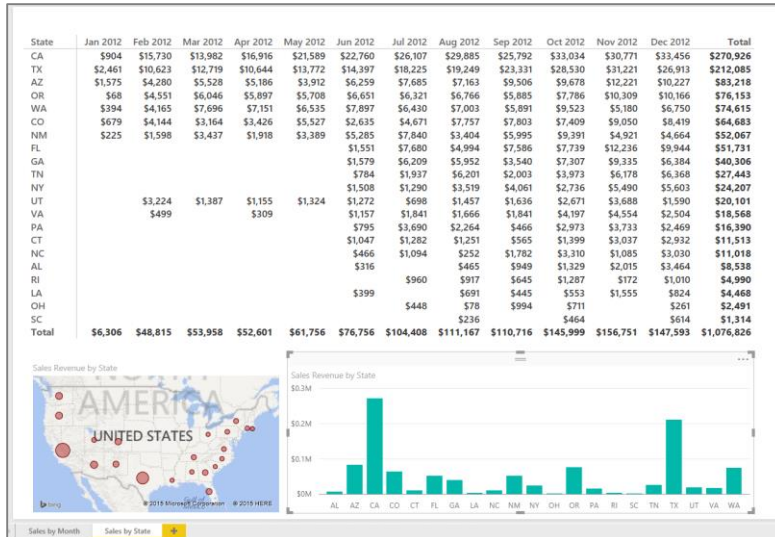
- e) Using the mouse, rearrange the visualizations on the page to match the following screenshot.

State	Jan 2012	Feb 2012	Mar 2012	Apr 2012	May 2012	Jun 2012	Jul 2012	Aug 2012	Sep 2012	Oct 2012	Nov 2012	Dec 2012	Total
CA	\$904	\$15,730	\$13,982	\$16,916	\$21,589	\$22,760	\$26,107	\$29,885	\$25,792	\$33,034	\$30,771	\$33,456	\$270,926
TX	\$2,461	\$10,623	\$12,719	\$10,644	\$13,772	\$14,397	\$18,225	\$19,249	\$23,331	\$28,530	\$31,221	\$26,913	\$212,085
AZ	\$1,575	\$4,280	\$5,528	\$5,186	\$3,992	\$6,259	\$7,685	\$7,163	\$9,506	\$8,678	\$12,221	\$10,227	\$83,218
OR	\$68	\$4,551	\$6,046	\$5,897	\$5,708	\$6,651	\$6,321	\$6,766	\$5,885	\$7,786	\$10,309	\$10,166	\$76,153
WA	\$394	\$4,165	\$7,696	\$7,151	\$6,535	\$7,897	\$6,430	\$7,003	\$5,891	\$9,523	\$5,180	\$6,750	\$74,615
CO	\$679	\$4,144	\$3,164	\$3,426	\$5,527	\$2,635	\$4,671	\$7,757	\$7,803	\$7,409	\$9,050	\$8,419	\$64,683
NM	\$229	\$3,598	\$3,437	\$1,918	\$3,389	\$5,285	\$7,840	\$3,404	\$5,995	\$9,391	\$4,921	\$4,664	\$52,067
FL						\$1,551	\$7,680	\$4,994	\$7,586	\$7,739	\$12,236	\$9,944	\$51,731
GA						\$1,579	\$6,209	\$5,952	\$3,540	\$7,307	\$9,335	\$6,384	\$40,306
TN						\$784	\$1,537	\$6,201	\$2,003	\$3,973	\$6,178	\$6,368	\$27,445
NY						\$1,508	\$1,290	\$3,519	\$4,061	\$2,736	\$5,490	\$5,603	\$24,207
UT						\$1,272	\$698	\$1,457	\$1,636	\$2,671	\$3,688	\$1,590	\$20,101
VA		\$3,224	\$1,387	\$1,155	\$1,324	\$1,157	\$1,841	\$1,666	\$1,641	\$4,197	\$4,554	\$2,504	\$18,568
PA		\$499		\$309		\$795	\$3,690	\$2,264	\$466	\$2,973	\$3,733	\$2,409	\$16,390
CT						\$1,047	\$1,282	\$1,251	\$565	\$1,399	\$3,037	\$2,932	\$11,513
NC						\$466	\$1,094	\$252	\$1,782	\$3,310	\$1,085	\$3,030	\$11,018
AL						\$316		\$465	\$949	\$1,329	\$2,015	\$3,464	\$8,538
RI								\$960	\$917	\$645	\$1,287	\$1,010	\$4,990
LA						\$399		\$691	\$445	\$553	\$1,555	\$824	\$4,468
OH								\$448	\$78	\$994	\$711	\$261	\$2,491
SC								\$236		\$464	\$614	\$614	\$1,314
Total	\$6,306	\$48,815	\$53,958	\$52,601	\$61,756	\$76,756	\$104,408	\$111,167	\$110,716	\$145,999	\$156,751	\$147,593	\$1,076,826

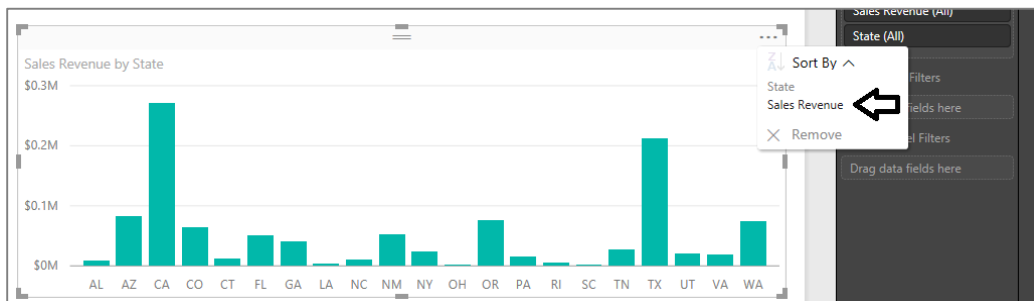
Below the table is a small map visualization titled 'Sales Revenue by State' showing the United States with red dots of varying sizes representing sales revenue by state. The map includes labels for 'AMERICA', 'UNITED STATES', 'Sargasso Sea', and 'Gulf of Mexico'. The Bing logo is visible in the bottom left corner, and copyright information for Microsoft Corporation and HERE is in the bottom right.

11. Add a third visualization to the page to display sales revenue by state and purchase type.

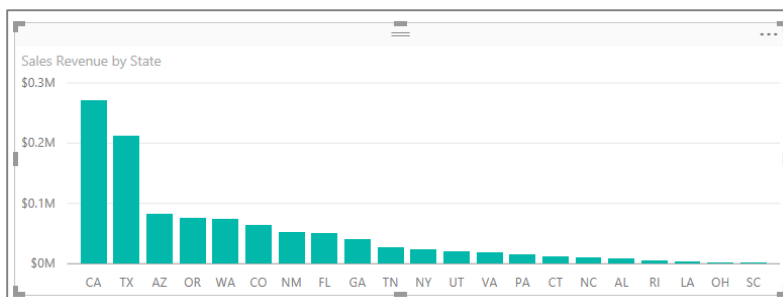
- Click on the white space in the bottom right corner of the page to make sure no visualization is selected.
- Select the **Sales Revenue** measure in the **Fields** list to create a new bar chart visualization.
- Select the **State** column in the **Fields** list to add a legend to the bar chart.
- Using the mouse, rearrange the visualizations on the page to match the following screenshot.



- Click the (...) menu in the top left corner of the new visualization and click **Sort By > Sales Revenue**.

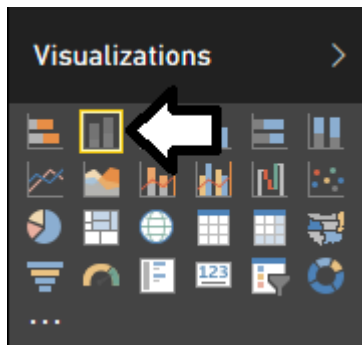


- The visualization should now display states sorted by sales revenue.

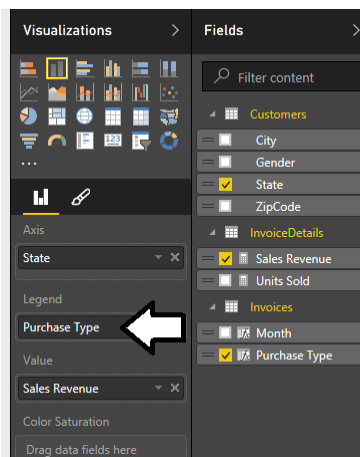


While the visualization appears to be a simple bar chart, it has actually been created as a clustered bar chart. You must modify the visualization type from a clustered bar chart to a standard bar chart to achieve the desired layout for this particular scenario.

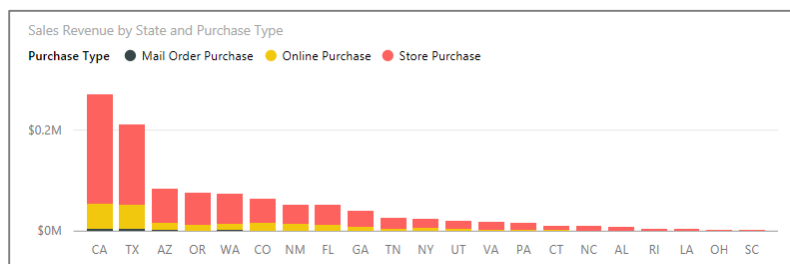
- Change the visualization type by clicking the **Bar chart** button in the **Visualizations** list. Note that you will not see the effects of this change until the next step.



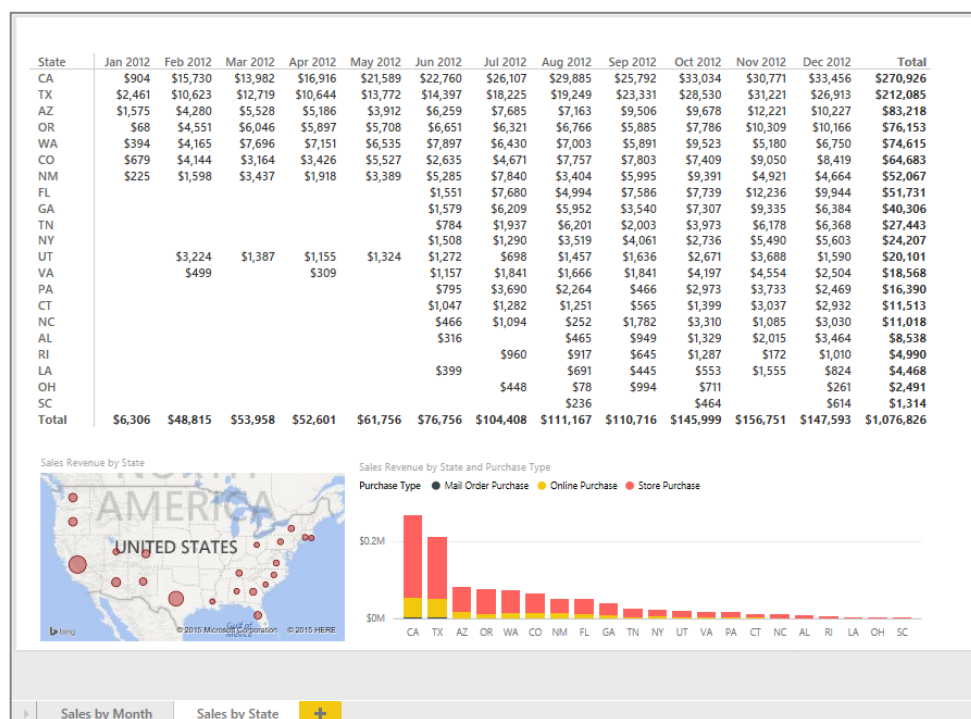
- h) Using the mouse, drag the **Purchase Type** column from the **Fields** list to the **Legend** well in the **Visualization** pane.



- i) Your visualization should now show the per-state breakdown of sales revenue by purchase type.



12. At this point, you have now finished designing the **Sales by State** page.

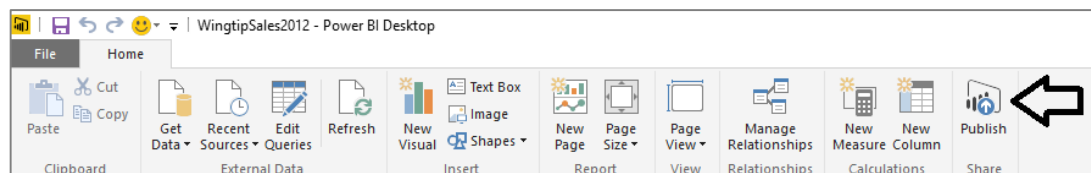


13. Save your work by clicking the Save button on the top left of the Power BI Desktop window.

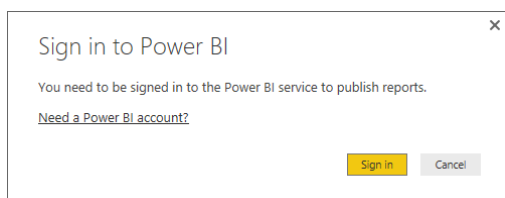
Exercise 5: Publishing a PBIX File to the Power BI Service

In this exercise you will complete your work by publishing the PBIX file to your personal workspace in the Power BI service.

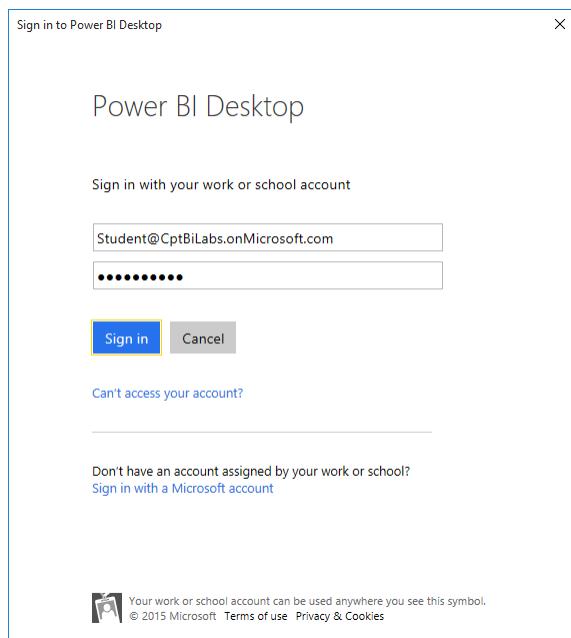
1. Make sure you still have the **Wingtipsales2012.pbix** file open that you created in the previous exercise.
2. Click the **Publish** button on the far right-hand side of the ribbon..



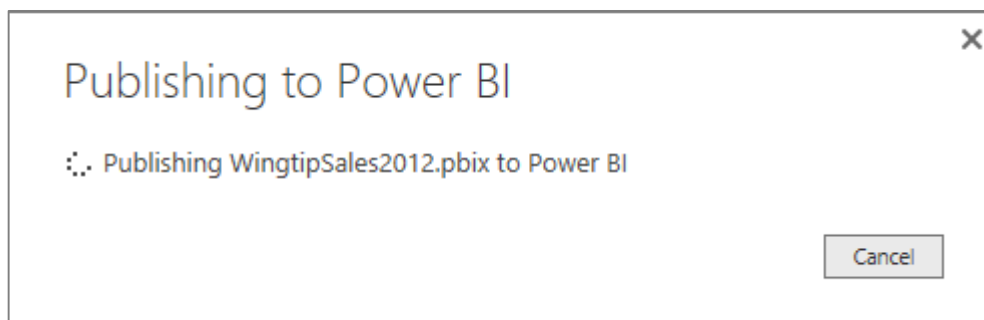
3. When prompted with the **Sign in to Power BI** dialog, click the **Sign In** button



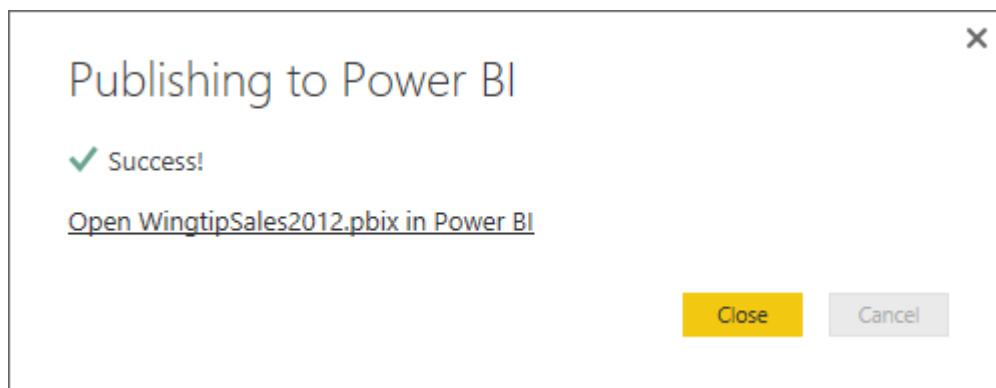
4. Sign into the Power BI service using your primary Office 365 account to give Power BI Desktop the access to publish the PBIX file.



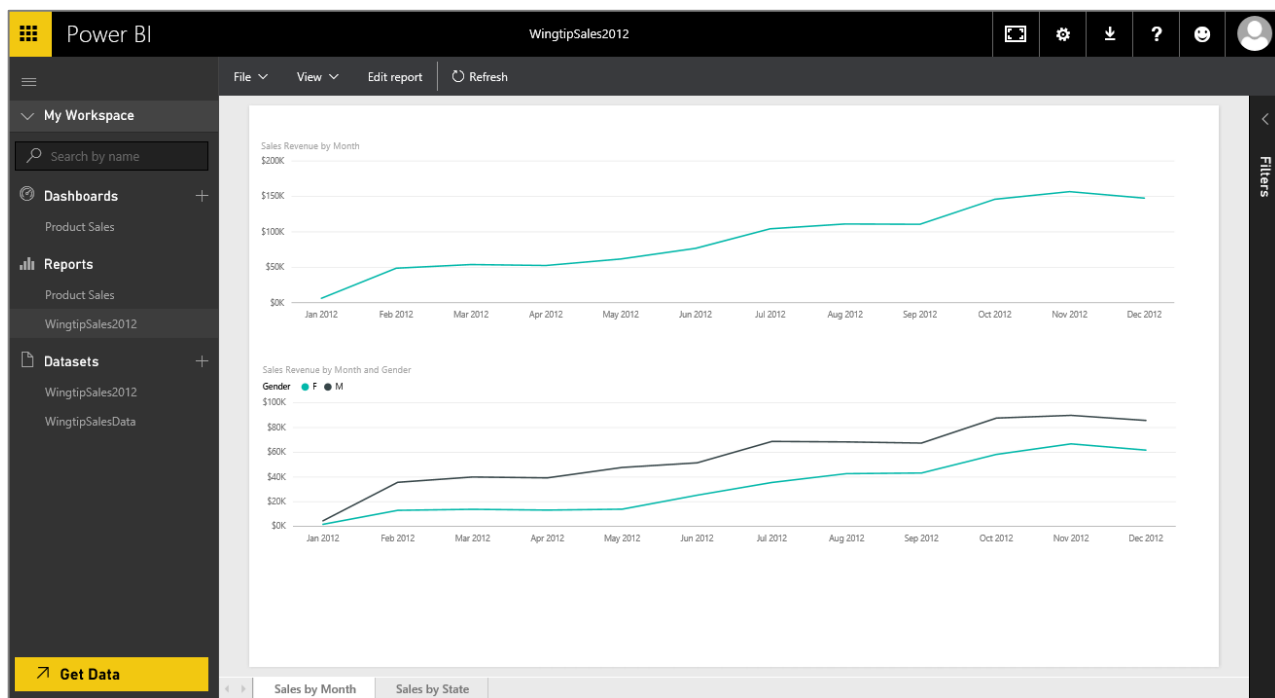
5. After you have signed in, Power BI Desktop will display the **Publishing to Power BI** dialog showing you that the publishing process is underway.



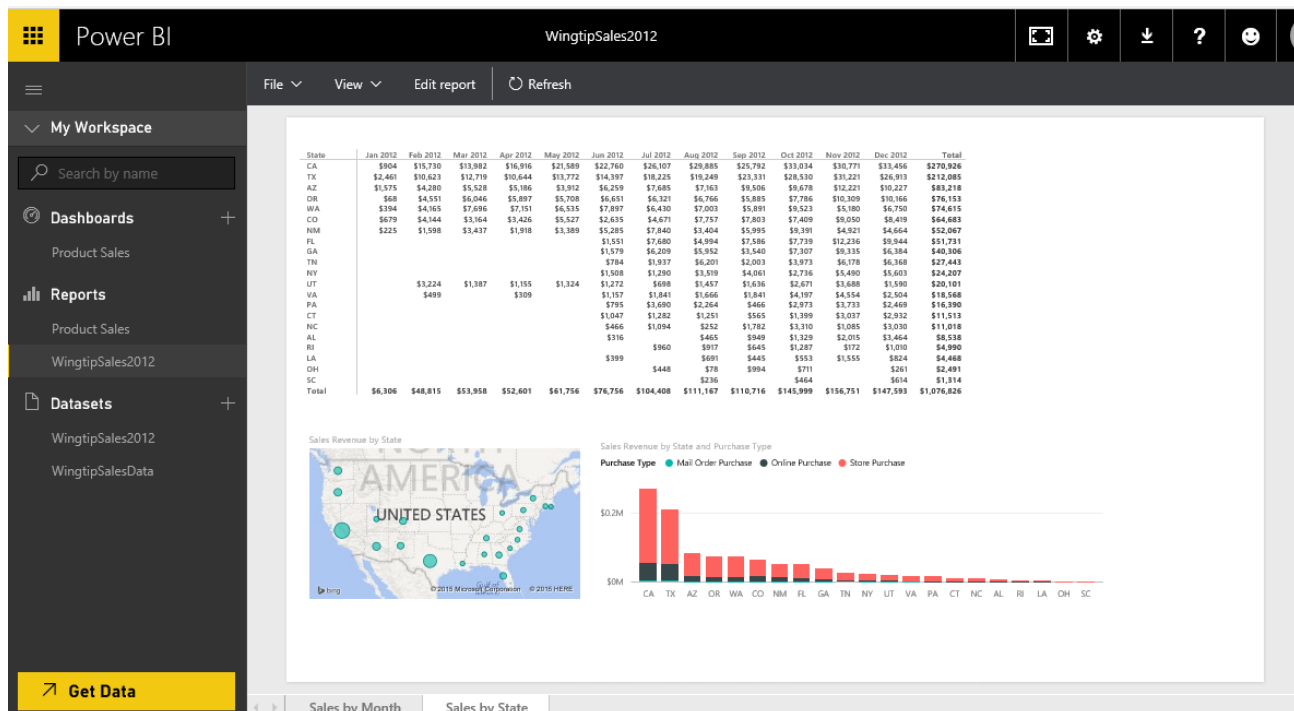
6. Once the publishing process has completed, the **Publishing to Power BI** dialog will display a success message and provide you with a link to **Open WingtipSales2012.pbix in Power BI**. Click on that link to navigate to the Power BI service using the browser.



7. You should now be able to see the **Sales by Month** page of the report you just created.



8. Click on the **Sales by State** link at the bottom of the screen to see the second page of the report.



9. You have now successfully created and published a simple BI solution using Power BI Desktop.

10. If you finish early and have extra time, experiment by clicking the Edit report button and seeing how you can continue to modify the pages of the report using the browser.