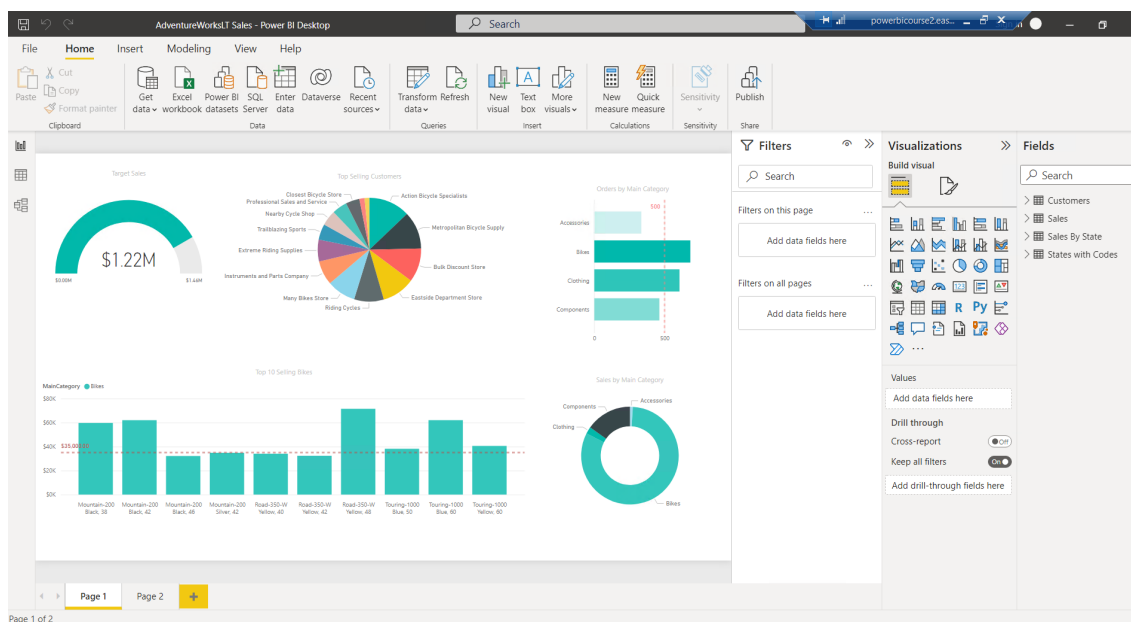


Module 6: Interactive Data Visualizations

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Note: Lab Solution is present in `D:\Labfiles\Lab06\Solution` folder:



Lab: Creating a Power BI Report

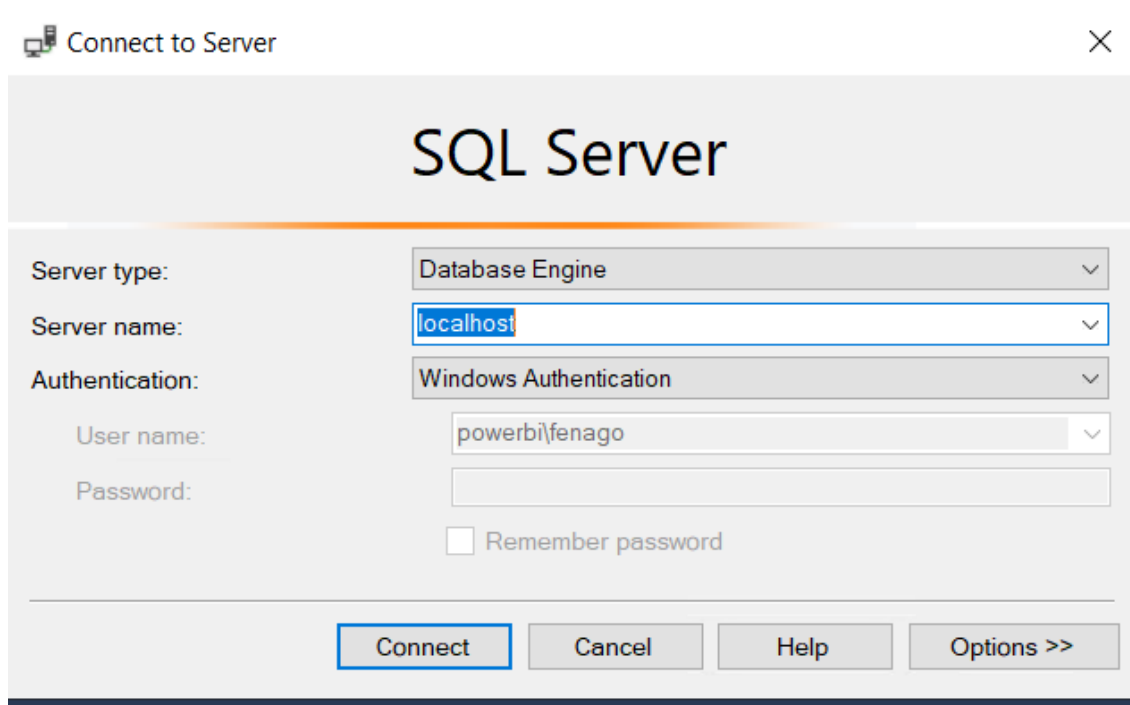
Exercise 1: Connecting to Power BI Data

Task 1: Prepare the Environment

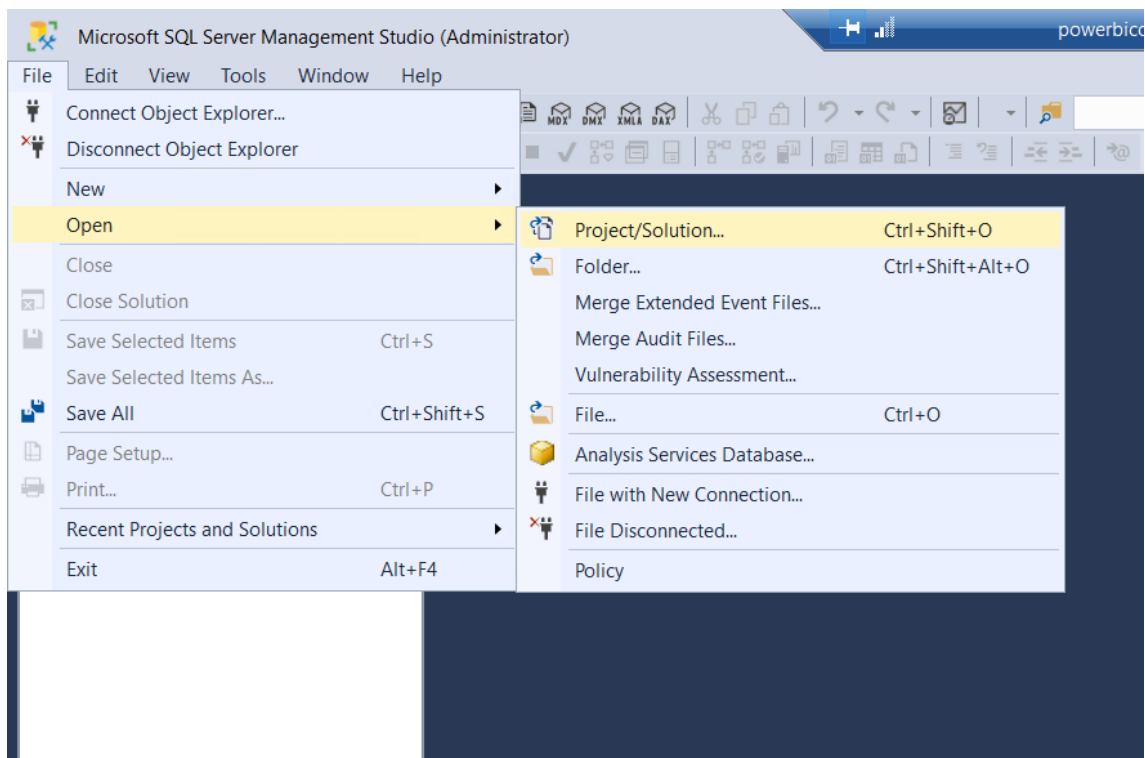
1. Ensure that you have copied all folders from `Desktop/power-bi-quickstart` folder into `*D:*` drive before starting the lab.
2. In the `D:\Labfiles\Lab06\Starter` folder, right-click **Setup.cmd**, and then click **Run as administrator**.
3. In the **User Account Control** dialog box, click **Yes**.
4. If prompted to continue this operation, type **Y**, and then press Enter.
5. When the script completes, press any key to close the window.

Task 2: Connect to Existing Data

1. On the Taskbar, click **Microsoft SQL Server Management Studio 18**.
2. In the **Connect to Server** dialog box, ensure SQL Server is set to the **localhost** database engine instance using **Windows Authentication**, and then click **Connect**.



3. On the **File** menu, point to **Open**, and then click **Project/Solution**.
4. In the **Open Project** dialog box, browse to the **D:\Labfiles\Lab06\Starter\Project** folder, and then double-click **Project.ssmssl**.



5. If Solution Explorer is not visible, on the **View** menu, click **Solution Explorer**.
6. In Solution Explorer, expand **Queries**, and then double-click **Lab Exercise 1.sql**.
7. On the Taskbar, click **Power BI Desktop**.
8. To close the getting started window, at the top-right of the window, click **X**.
9. In the **Power BI Desktop** window, click **Get data**.
10. In the **Get Data** dialog box, click **SQL Server**, and then click **Connect**.
11. In the **SQL Server database** dialog box, in the **Server** box, type the URL of the server **localhost**.
12. In the **Database (optional)** box, type **AdventureWorksLT**.
13. Expand the **Advanced options** box.
14. In SQL Server Management Studio, in the **Lab Exercise 1.sql** query, copy the query under **Task 1** to the clipboard.
15. In Power BI Desktop, in the **SQL statement (optional, requires database)** box, paste the query, and then click **OK**.

SQL Server database

Server ⓘ
localhost

Database (optional)
AdventureWorksLT

Data Connectivity mode ⓘ
☒ Import
☐ DirectQuery

Advanced options
Command timeout in minutes (optional)

SQL statement (optional, requires database)

```
SELECT c.AddressLine1, c.AddressLine2, c.City, c.StateProvince, c.CountryRegion, c.PostalCode  
FROM SalesLT.Customer AS a  
INNER JOIN SalesLT.CustomerAddress AS b ON a.CustomerID = b.CustomerID  
INNER JOIN SalesLT.[Address] AS c ON b.AddressID = c.AddressID  
WHERE b.AddressType = 'Main Office'
```

☒ Include relationship columns
☐ Navigate using full hierarchy
☐ Enable SQL Server Failover support

OK

Cancel

18. If the **SQL Server database** dialog box appears, on the **Database** tab, in the **User name** box, type **Student**, in the **Password** box, type **Pa55w.rd**, and then click **Connect**.
19. In the data preview window, click **Load**.

localhost: AdventureWorksLT

CustomerID	CompanyName	NameStyle	Title	FirstName	LastName	SalesPerson	AddressLine1
29485	Professional Sales and Service	FALSE	Ms.	Catherine	Abel	adventure-works\linda3	57251 Serene Blvd
29486	Riders Company	FALSE	Ms.	Kim	Abercrombie	adventure-works\jillian0	Tanger Factory
29489	Area Bike Accessories	FALSE	Ms.	Frances	Adams	adventure-works\shu0	6900 Sisk Road
29490	Bicycle Accessories and Kits	FALSE	Ms.	Margaret	Smith	adventure-works\david8	Lewiston Mall
29492	Valley Bicycle Specialists	FALSE	Mr.	Jay	Adams	adventure-works\jillian0	Blue Ridge Mall
29494	Vinyl and Plastic Goods Corporation	FALSE	Mr.	Samuel	Agcaoili	adventure-works\josé1	No. 25800-130 King Street
29496	Fun Toys and Bikes	FALSE	Mr.	Robert	Ahlering	adventure-works\shu0	6500 East Grant Road
29497	Great Bikes	FALSE	Mr.	François	Ferrier	adventure-works\david8	Eastridge Mall
29499	Valley Toy Store	FALSE	Ms.	Amy	Alberts	adventure-works\josé1	252851 Rowan Place
29502	Major Sport Suppliers	FALSE	Mr.	Paul	Alcorn	adventure-works\david8	White Mountain Mall
29503	Family's Favorite Bike Shop	FALSE	Mr.	Gregory	Alderson	adventure-works\garrett1	25981 College Street
29505	Imported and Domestic Cycles	FALSE	Ms.	Michelle	Alexander	adventure-works\linda3	22589 West Craig Road
29506	Systematic Sales	FALSE	Mr.	Sean	Jacobson	adventure-works\shu0	2551 East Warner Road
29508	Mountain Toy Store	FALSE	Mr.	Marvin	Allen	adventure-works\jillian0	First Colony Mall
29510	Designated Distributors	FALSE	Mr.	Cecil	Allison	adventure-works\josé1	254 Colonnade Road
29511	Bold Bike Accessories	FALSE	Mr.	Oscar	Alpuerto	adventure-works\linda3	Rocky Mountain Pines Out
29515	Serious Cycles	FALSE	Mr.	Maxwell	Amland	adventure-works\garrett1	Suite 99320 255 - 510th Av
29517	Novelty Bikes	FALSE	Ms.	Ramona	Antrim	adventure-works\michael9	998 Forest Road
29521	Brightwork Company	FALSE	Mr.	Tom	Johnston	adventure-works\shu0	Belz Factory Outlet
29522	Resale Services	FALSE	Mr.	Thomas	Armstrong	adventure-works\linda3	Fox Hills

The data in the preview has been truncated due to size limits.

Load

Transform Data

Cancel

- On the **Home** tab, click the **Get Data** arrow, and then click **More**.
- In the **Get Data** dialog box, click **SQL Server**, and then click **Connect**.
- In the **SQL Server database** dialog box, in the **Server** box, type the URL of the Azure server **localhost**.
- In the **Database (optional)** box, type **AdventureWorksLT**.
- Expand the **Advanced options** box.
- In SQL Server Management Studio, in the **Lab Exercise 1.sql** query, copy the query under **Task 2** to the clipboard.
- In Power BI Desktop, in the **SQL statement (optional, requires database)** box, paste the query, and then click **OK**.
- In the data preview window, click **Load**.
- On the **File** menu, click **Save**.
- In the **Save As** dialog box, navigate to **D:\Labfiles\Lab06\Starter**, in the **File name** box, type **AdventureWorksLT Sales 6.pbix**, and then click **Save**.

Task 3: Shape Data

- In the **FIELDS** pane, right-click **Query1**, click **Rename**, type **Customers**, and then press Enter.
- Right-click **Query2**, click **Rename**, type **Sales**, and then press Enter.

3. Expand the two tables to display all of the fields.
4. In the left navigation bar, click **Data**.
5. In the **FIELDS** pane, click the **Customers** table, if it is not already selected.
6. Right-click the **NameStyle** column, and click **Delete**.
7. In the **Delete column** dialog box, click **Delete**.
8. Right-click the **SalesPerson** column, and click **Delete**.
9. In the **Delete column** dialog box, click **Delete**.
10. Right-click the **CustomerID** column, and then click **Hide in report view**.
11. Click the **AddressLine1** column header.
12. On the **Modeling** tab, in the **Properties** group, click **Data Category: Uncategorized**, and then click **Address**.
13. Click the **City** column header.
14. On the **Modeling** tab, in the **Properties** group, click **Data Category: Uncategorized**, and then click **City**.
15. Click the **StateProvince** column header.
16. On the **Modeling** tab, in the **Properties** group, click **Data Category: Uncategorized**, and then click **State or Province**.
17. Click the **CountryRegion** column header.
18. On the **Modeling** tab, in the **Properties** group, click **Data Category: Uncategorized**, and then click **Country/Region**.
19. Click the **PostalCode** column header.
20. On the **Modeling** tab, in the **Properties** group, click **Data Category: Uncategorized**, and then click **Postal Code**.
21. On the **Modeling** tab, in the **Calculations** group, click **New Column**, and then in the formula bar, type the following expression, and then press Enter:

```
FullAddress = Customers[AddressLine1] & ", " & Customers[City] & ", " &  
Customers[StateProvince] & ", " & Customers[CountryRegion] & ", " &  
Customers[PostalCode]
```

22. In the **FIELDS** pane, click **Sales**.
23. Right-click the **RevisionNumber** column, and click **Delete**.
24. In the **Delete column** dialog box, click **Delete**.
25. Right-click the **SalesOrderNumber** column, and click **Delete**.
26. In the **Delete column** dialog box, click **Delete**.
27. Right-click the **CustomerID** column, and click **Hide in report view**.
28. Right-click the **SalesOrderID** column, and click **Hide in report view**.

29. Right-click the **SalesOrderDetailID** column, and click **Hide in report view**.
30. On the **Modeling** tab, in the **Calculations** group, click **New Column**, and then in the formula bar, type the following expression, and then press Enter:

```
LineTotal = Sales[OrderQty] * Sales[ListPrice]
```

31. Click the **LineTotal** column header.
32. On the **Modeling** tab, in the **Formatting** group, click **Format: General**, point to **Currency**, and then click **\$ English (United States)**.
33. On the **Modeling** tab, in the **Calculations** group, click **New Measure**, and then in the formula bar, type the following expression, and then press Enter:

```
TargetSales = SUM('Sales'[LineTotal]) * 1.2
```

34. On the **File** menu, click **Save**.

Task 4: Combine Data

1. In Power BI Desktop, on the **Home** tab, click the **Get Data** arrow, and then click **Excel**.
2. In the **Open** dialog box, browse to the **D:\Labfiles\Lab06\Starter\Project** folder, click **States.xlsx**, and then click **Open**.
3. In the **Navigator** dialog box, select the **States** check box, and then click **Load**.
4. In the **FIELDS** pane, right-click **States**, click **Rename**, type **Sales by State**, and then press Enter.
5. On the **Home** tab, the **Get Data** arrow, and then click **Web**.
6. In the **From Web** dialog box, in the **URL** box, type http://en.wikipedia.org/wiki/List_of_U.S._state_abbreviations, and then click **OK**.
7. In the **Navigator** dialog box, select the **Codes and abbreviations for U.S. states, federal district, territories, and other regions** check box, and then click **Load**.
8. In the **FIELDS** pane, click **Codes and abbreviations for U.S. states, federal district, territories, and other regions** to display the data. The table has 26 rows at the bottom and 3 rows at the top that are not needed.
9. On the **Home** tab, in the **External data** group, click the **Edit Queries** arrow, and then click **Edit Queries**.
10. In Power Query Editor, in the **Queries [4]** pane, click **Codes and abbreviations for U.S. states, federal district, territories, and other regions**.
11. On the **Home** tab, in the **Reduce Rows** group, click the **Remove Rows** arrow, and then click **Remove Bottom Rows**.
12. In the **Remove Bottom Rows** dialog box, in the **Number of rows** box, type **26**, and then click **OK**.
13. On the **Home** tab, in the **Reduce Rows** group, click the **Remove Rows** arrow, and then click **Remove Top Rows**.
14. In the **Remove Top Rows** dialog box, in the **Number of rows** box, type **3**, and then click **OK**.
15. Click the **ANSI2** column header, and then hold down the Ctrl key while selecting all of the columns to the right. This selects multiple rows.

16. Still holding down Ctrl, click the **Name and status of region2** and **Header** columns to include this in the selection.
 17. On the **Home** tab, in the **Manage Columns** group, click the **Remove Columns** arrow, and then click **Remove Columns**.
 18. In the **QUERY SETTINGS** pane, under **Properties**, in the **Name** box, type **States with Codes**, and then press Enter.
 19. On the **Home** tab, in the **Transform** group, click **Use First Row as Headers**.
 20. Right-click the **United States of America** column header, click **Rename**, type **State Name**, and then press Enter.
 21. Right-click the **US USA 840** column header, click **Rename**, type **State Code Long**, and then press Enter.
 22. In the **Queries [4]** pane, click **Sales by State**.
 23. On the **Home** tab, click **Combine**, and then click **Merge Queries**.
 24. In the **Merge** dialog box, in the **Sales by State** table, click the **States** column.
 25. In the list, click **States with Codes**, and then click the **State Name** column.
 26. If the **Privacy levels** dialog box appears, in both the right-hand list boxes, click **Organizational**, and then click **Save**.
 27. In the **Merge** dialog box, click **OK**. The new column is added to the table and contains the merged **States with Codes** table.
 28. If the **Information is required about data privacy** message appears, click **Continue**.
 29. In the **States with Codes** column header, click the **Expand** icon, clear **(Select All Columns)**, select **State Code Long**, and then click **OK**. The column now shows just the state codes.
 30. Right-click the **States with Codes.State Code Long** column, click **Rename**, type **State Code**, and then press Enter.
 31. On the **File** menu, click **Close & Apply**.
 32. If the **Apply query changes** dialog box appears, click **Close**.
 33. If the **There are pending changes in your queries that haven't been applied** message appears, click **Apply changes**.
 34. In the **FIELDS** pane, right-click **States with Codes**, and then click **Hide in report view**.
 35. On the **File** menu, click **Save**.
 36. Leave Power BI Desktop open for the next exercise.
-

Exercise 2: Building Power BI Reports

Task 1: Create a Chart

1. In Power BI Desktop, in the left navigation bar, click **Report**.
2. In the **VISUALIZATIONS** pane, click **Gauge**.
3. In the **FIELDS** pane, in the **Sales** table, drag the **LineTotal** field to the **Value** property of the gauge.

4. In the **FIELDS** pane, in the **Sales** table, drag the **TargetSales** measure to the **Target value** property of the gauge.
5. In the **VISUALIZATIONS** pane, click **Format**, expand **Gauge axis**, and then in the **Max** box, type **1460000**.
6. Expand **Title**, in the **Title text** box, type **Target Sales**, and then click **Center**.
7. Click an empty area on the report canvas.
8. In the **FIELDS** pane, in the **Customers** table, drag the **CompanyName** field onto the report.
9. In the **FIELDS** pane, in the **Sales** table, select the **LineTotal** check box.
10. In the **VISUALIZATIONS** pane, click **Pie chart**.
11. Expand the chart to make all of the company names visible by using the resizer handles on the edge of the chart.
12. With the focus still on the pie chart, in the **VISUALIZATIONS** pane, click **Format**, and then click **Title**.
13. In the **Title text** box, type **Top Selling Customers**, and then click **Center**.
14. In the **FIELDS** pane, in the **Sales** table, drag the **MainCategory** field onto the report canvas.
15. In the **FIELDS** pane, in the **Sales** table, drag the **OrderQty** field onto the table.
16. In the **VISUALIZATIONS** pane, click **Stacked bar chart**.
17. In the **VISUALIZATIONS** pane, click **Analytics**, expand **Constant Line**, and then click **Add**.
18. In the **Value** box, type **500**.
19. Change **Color** to red, toggle **Data label** to **On**, and then change the color to **red**.
20. In the **VISUALIZATIONS** pane, click **Format**, and expand **Title**.
21. In the **Title Text** box, type **Orders by Main Category**, and then click **Center**.
22. Click the report canvas to give it focus, and then in the **VISUALIZATIONS** pane, click **Donut chart**.
23. In the **FIELDS** pane, in the **Sales** table, select the **MainCategory** and **LineTotal** check boxes.
24. In the **VISUALIZATIONS** pane, click **Format**, and then expand **Title**.
25. In the **Title Text** box, type **Sales by Main Category**, and then click **Center**.
26. In the **FIELDS** pane, in the **Sales** table, drag the **Product** field onto the report canvas.
27. In the **FIELDS** pane, in the **Sales** table, drag the **LineTotal** field onto the products table chart.
28. In the **FIELDS** pane, in the **Sales** table, select the **MainCategory** check box.
29. In the **VISUALIZATIONS** pane, click **Fields**.
30. In the **Filters** pane, expand **LineTotal is (All)**.
31. In the **Show items when the value** list, click **is greater than**, in the box below, type **32000**, and then click **Apply filter**.
32. Expand **MainCategory is (All)**, and then select the **Bikes** check box.
33. In the **VISUALIZATIONS** pane, click **Stacked column chart**.

34. In the **VISUALIZATIONS** pane, click **Format**, and then expand **Title**.
35. In the **Title Text** box, type **Top Selling Bikes**, and then click **Center**.
36. In the **VISUALIZATIONS** pane, click **Analytics**, expand **Constant Line**, and then click **Add**.
37. In the **Value** box, type **35000**, and then set **Color** to **red**.
38. Toggle **Data label** to **On**, and then set **Color** to **red**.
39. Expand the chart to fill the remaining space on the report canvas. If necessary, move your visuals around to make them fit.
40. On the **File** menu, click **Save**.

Task 2: Create a Map Visualization

1. At the bottom of the report, click the + icon to add a new page.
2. In the **FIELDS** pane, in the **Customers** table, select the **City** check box.
3. In the **FIELDS** pane, in the **Sales** table, select the **LineTotal** check box.
4. Using the grabber tool on the right side of the chart, resize the map to show all of the bubbles.
5. Notice that the bubbles are proportionally sized to represent the data.
6. In the **VISUALIZATIONS** pane, click **Format**, and then expand **Title**.
7. In the **Title Text** box, type **World Sales by City**, and then click **Center**.
8. Click the report canvas, and then in the **Sales by State** table, select the **State Code** check box.
9. In the **Sales by State** table, select the **SalesYTD** check box.
10. Using the grabber tool on the right side and at the bottom of the chart, resize the map to show all the states.
11. Notice that the sales cluster in one area.
12. Position the cursor on **US-CA** to see the sales figure. The value has not been formatted as currency.
13. In the **FIELDS** pane, in the **Sales by State** table, click **SalesYTD**.
14. On the **Modeling** tab, click **Format: General**, point to **Currency**, and then click **\$ English (United Stated)**.
15. Position the cursor on **US-CA** on the map, and notice that the value has been formatted.
16. In the **VISUALIZATIONS** pane, click **Format**, and then expand **Title**.
17. In the **Title Text** box, type **Sales by State**, and then click **Center**.
18. On the **File** menu, click **Save**.
19. Close Power BI Desktop, and then close SQL Server Management Studio without saving any changes.