

**Business Analytics with Power BI**

Module 3 – Predictive Analytics with Power BI and R

Student Lab Manual – Lab 3 – Using R with Power BI

Version 1.0

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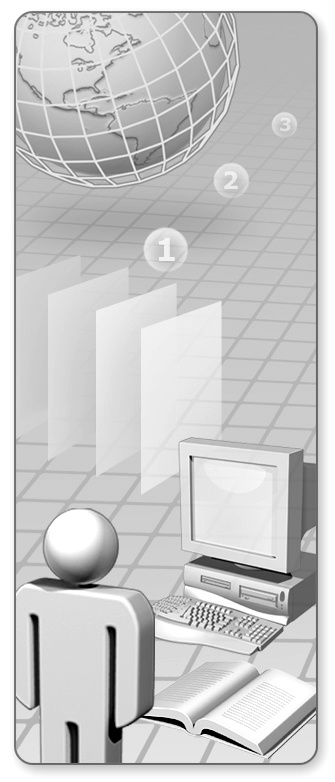
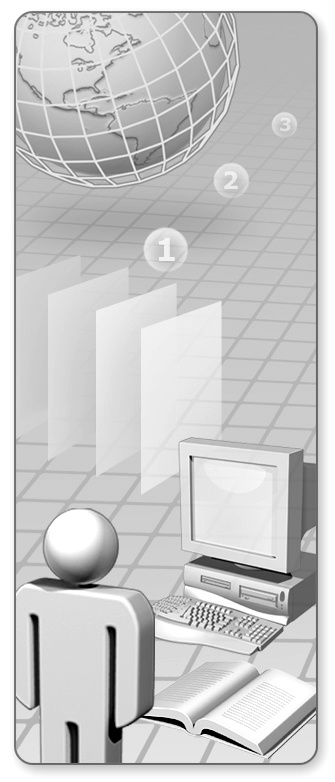
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Module 3   
  
Predictive Analytics with Power BI and R  
  
Lab 3 –  Using R with Power BI

# Lab 3: Using R with Power BI

### Introduction

As seen in the lab 2, R language is very powerful. In this lab, you will use R as a data source for your analysis and also to create rich visualizations by using R libraries (**ggplot2** and **corrplot**).

### Objectives

After completing this lab, you will be able to:

* Create an analysis in Microsoft Power BI by using R data.
* Show R plots directly into a Power BI Desktop file.

### Estimated time to complete this lab

45 minutes (depends on experience)

### Resources

|  |  |
| --- | --- |
| Virtual machine (VM) Name | **Business Analytics with Power BI - Module 1** |
| Domain | **POWERBI-WIN10** |
| User | **POWERBI-WIN10\LabUser** |
| Password | **P@ssw0rd1!** |
| Lab Files | **E:\Labs\** |
| Asset Files | **E:\Assets\** |

# Exercise 1: Using R as a Data Source

### Introduction

In this exercise, you will create an analysis where the source is a script in R.

### Objectives

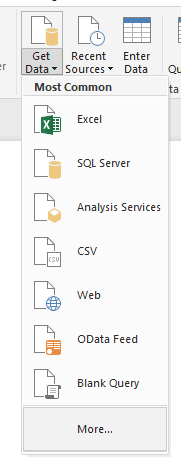
After completing this exercise, you will be able to:

* Create an analysis in Power BI using R data.

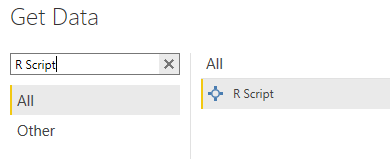
### Using R as a Data Source

In this task, you will create a Power BI Desktop report which data will come from a R script.

1. To open **Power BI Desktop**, n the taskbar, click the **Power BI Desktop** shortcut.
2. Click **Get Data** (ribbon menu), and then select **More**.



1. In theSearch box, type **R Script**, and then click **Connect**.

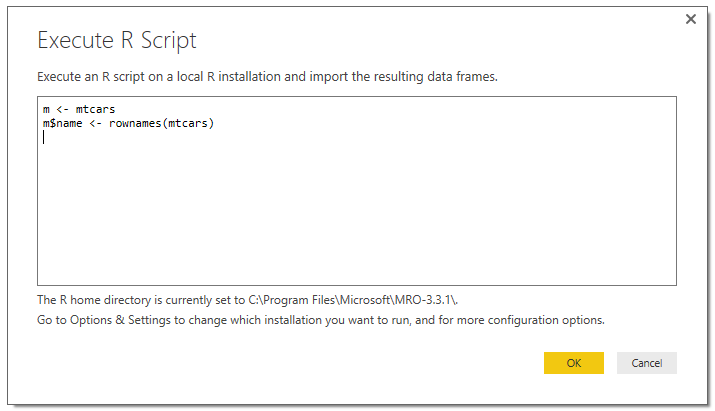


1. You should now see a window called **Execute R Script**. Input the following script to it.

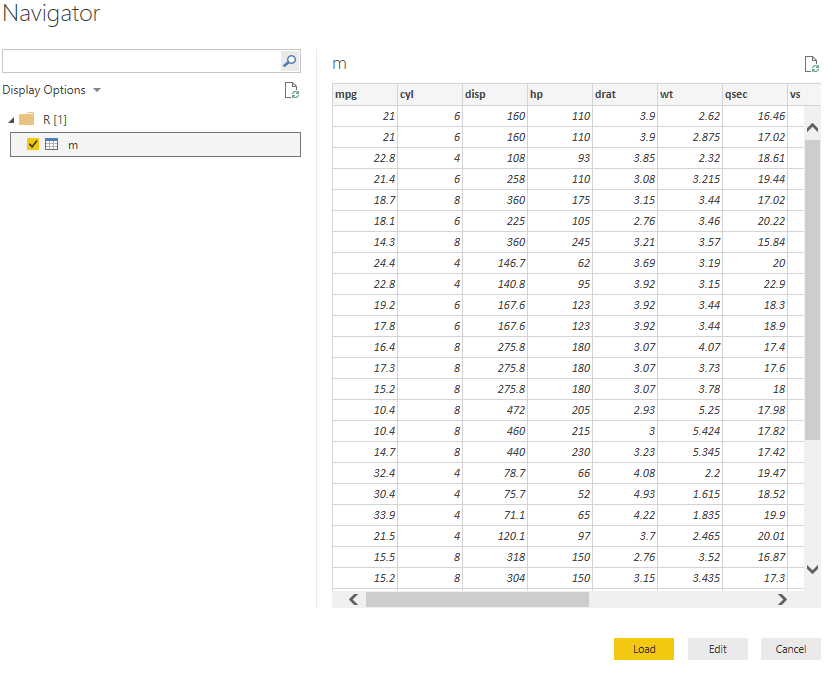
m <- mtcars  
m$name <- rownames(mtcars)

*Note: You can input any R script here, as long you have R installed on your machine and the referenced libraries are installed.*

1. Your screen should be similar to the following screenshot. R is already installed on your virtual machine. Click **OK**.



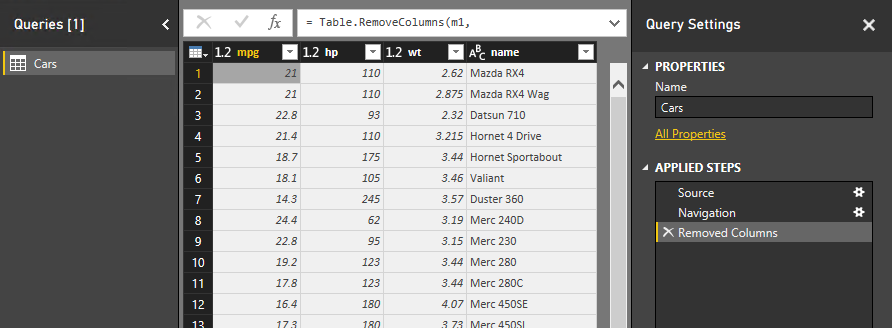
1. In the navigator window, you should see **m** as an available dataset to use. Click the check box (left side of “m”) to select it. After that, you will be able to see a preview of your data.



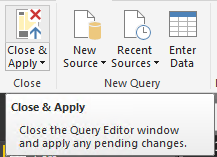
1. Click **Edit**.
2. In the **Query Settings** pane, change the name from **m** to **Cars**.
3. Remove the following columns from your query:

**cyl**, **disp**, **drat**, **qsec**, **vs**, **am**, **gear**, and **carb**

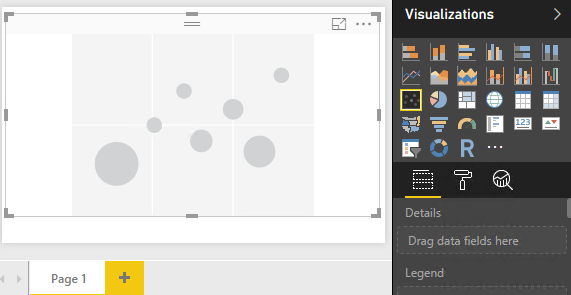
1. Your screen should be similar to the following screenshot:



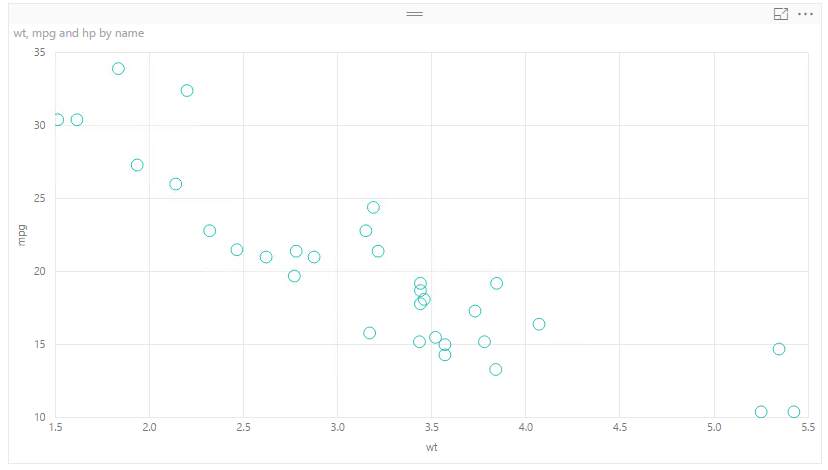
1. Click **Close & Apply**.



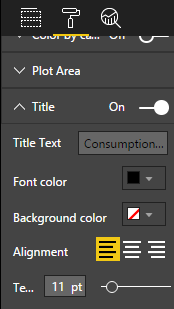
1. Add a **Scatter Chart** visual, and resize it to a bigger size (to occupy all the area of report).



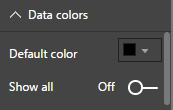
1. Add the field **name** to **Details**.
2. Add the field **wt** to **X Axis**.
3. Add the field **mpg** to **Y Axis**.
4. Add the field **hp** to **Tooltips**.
5. You should now have the following chart:



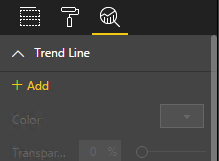
1. With the scatter chart selected, go to **Format** tab, expand **Title**, and change the **Title Text** property to **Consumption by weight**.
2. Change the **Font color** to **black**.
3. Change the **Text size** property to **11 pt**.



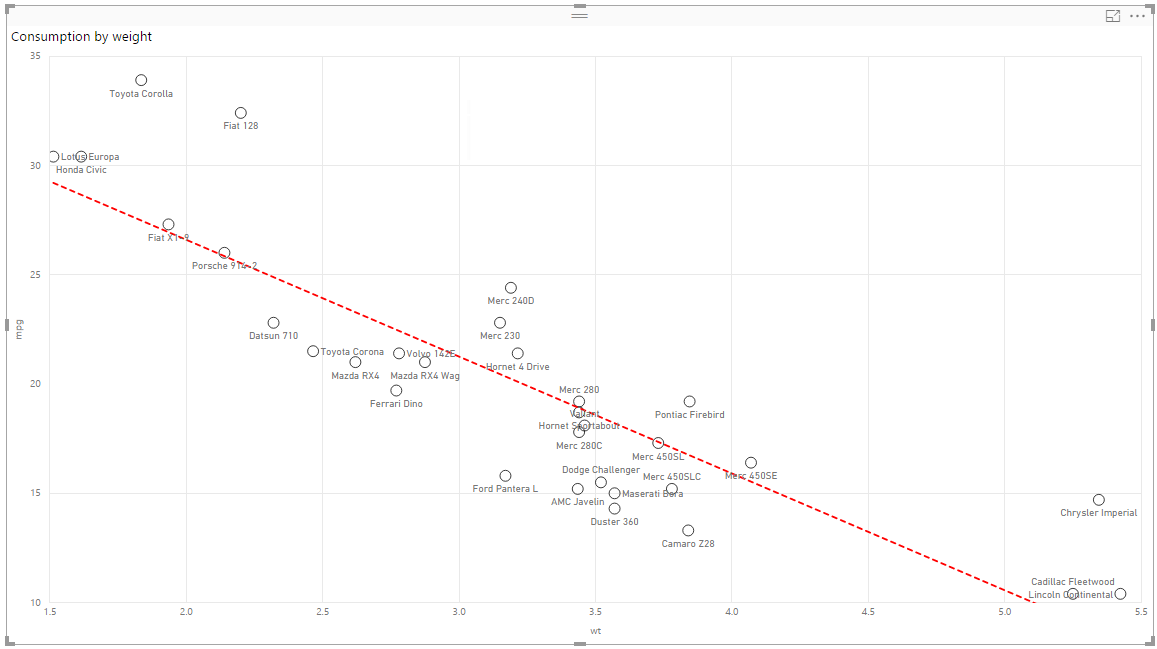
1. Still on **Format**, go to **Data colors**, and change the **Default color** to **black**,



1. Locate **Category labels** and change it to **On**.
2. Select the **Analytics** pane (you must have the scatter chart selected). Search for **Trend Line** and click **+ Add**.



1. Change the color to **Red**.
2. Now you have a scatter chart that uses R to generate data, and is plotting a trend line (similar to a linear regression).



1. You can save the report. Create and use the **E:\Labs\M3Lab3\** folder. Name the report as **RDataSource.pbix** and close **Power BI Desktop**.

# Exercise 2: Using R Visuals

### Introduction

In this exercise, you will use R Visual to show two charts generated by R code.

### Objectives

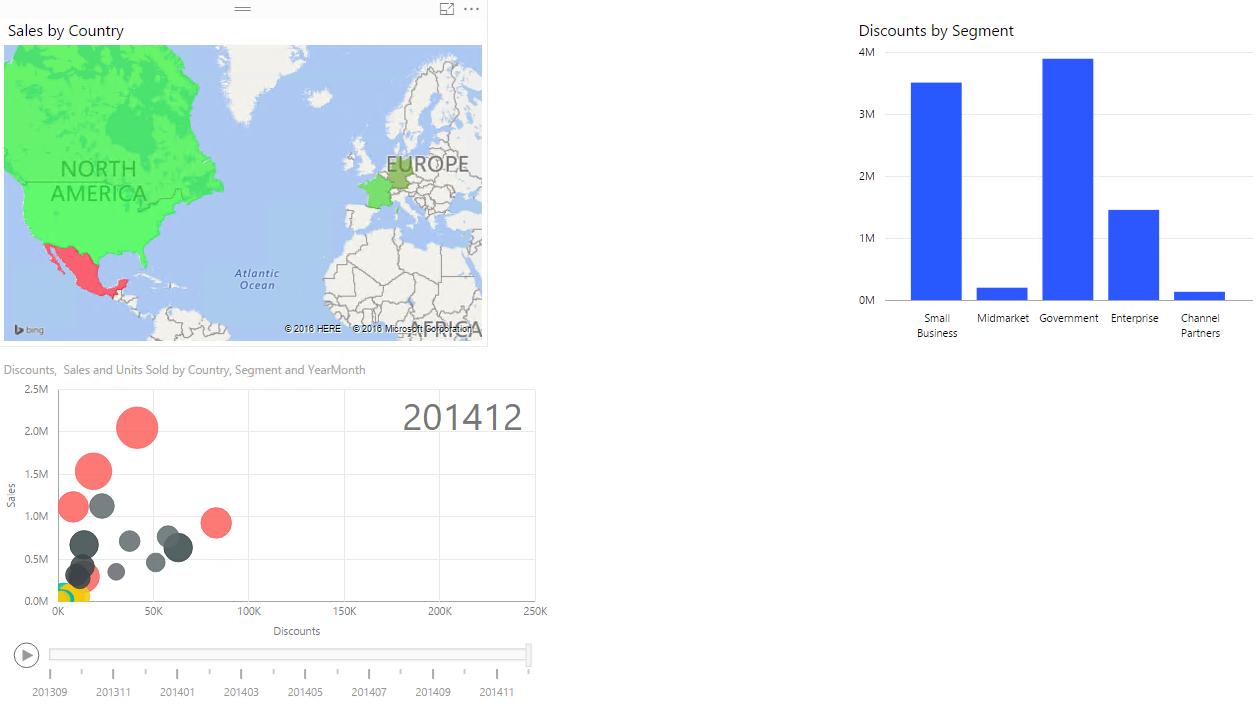
After completing this exercise, you will be able to:

* Show R plots directly into a Power BI Desktop file.

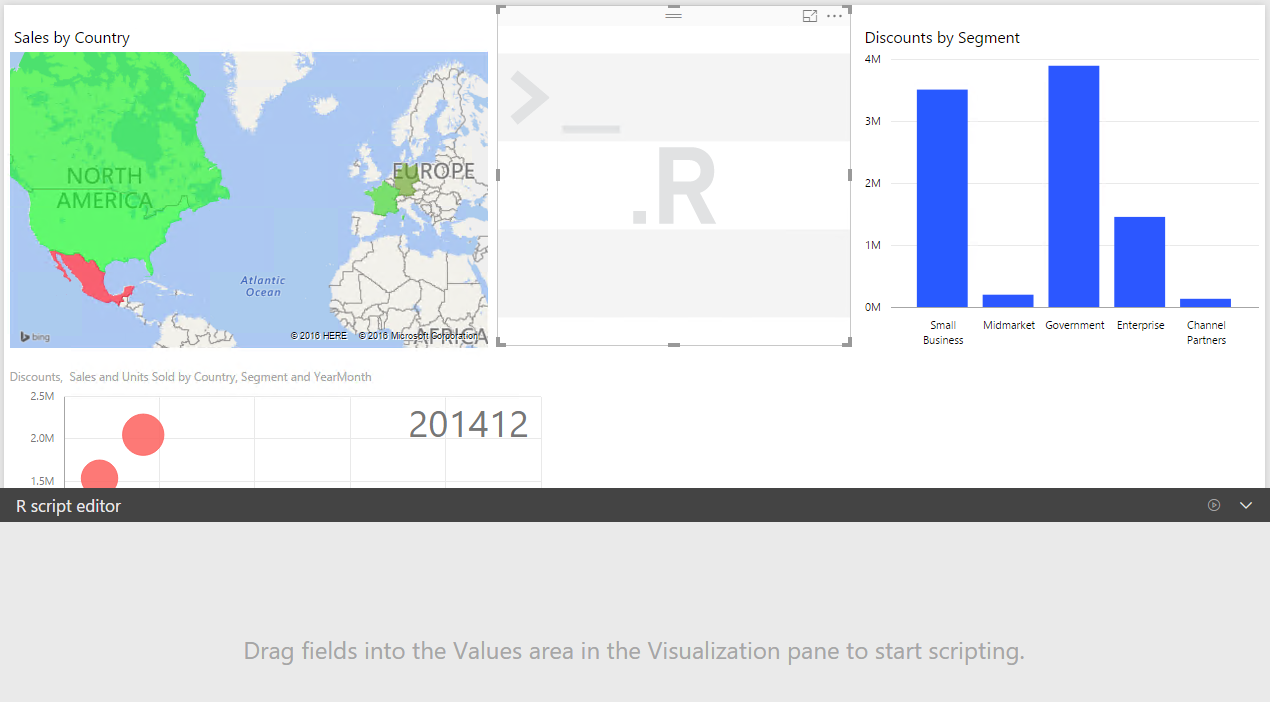
### Using R Visuals

In this task, you will edit an existing Power BI Desktop file to add two new visualizations created by using R code.

1. Go to **E:\Assets\M3 – Lab 3.** Create a copy from **Lab3\_RVisuals\_Initial.pbix** in **E:\Labs\M3Lab3**.
2. Open the file you just copied. You should see the following report:



1. Locate the R visual in the **Visualizations** pane. Add it to your report. Position it between the map and bar chart.

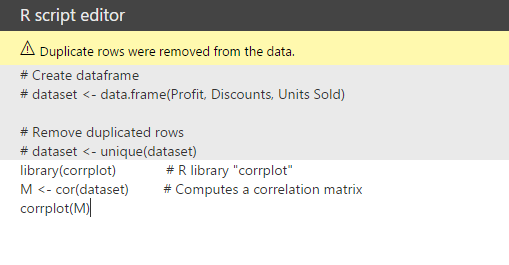


1. Drag the following fields to the **Values** property of the R visual. These values will compose the data frame available (called dataset) to you in the R script window:

**Profit**, **Discounts** and **Units Sold**.

1. Add the following R script to the **R script editor** window.

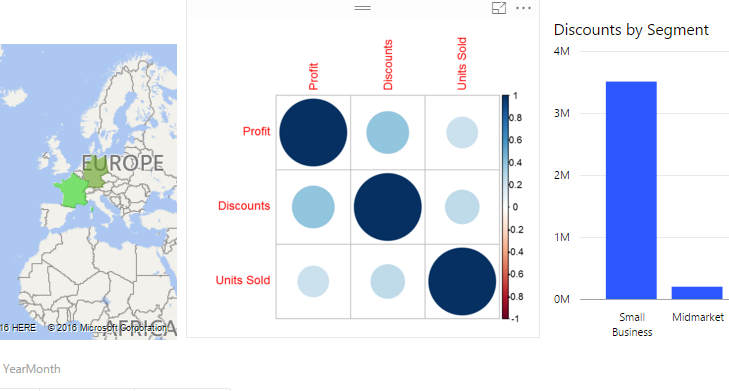
library(corrplot) # R library "corrplot"  
M <- cor(dataset) # Computes a correlation matrix  
corrplot(M)



1. Click the play icon.



1. You should see the following result:



1. Add another R visual to the region below the existing R visual and bar chart.
2. Drag the following fields to the **Values** property from the R visual you just added:

**Sales** and **Segment**

1. Add the following code to the **R script editor** window.

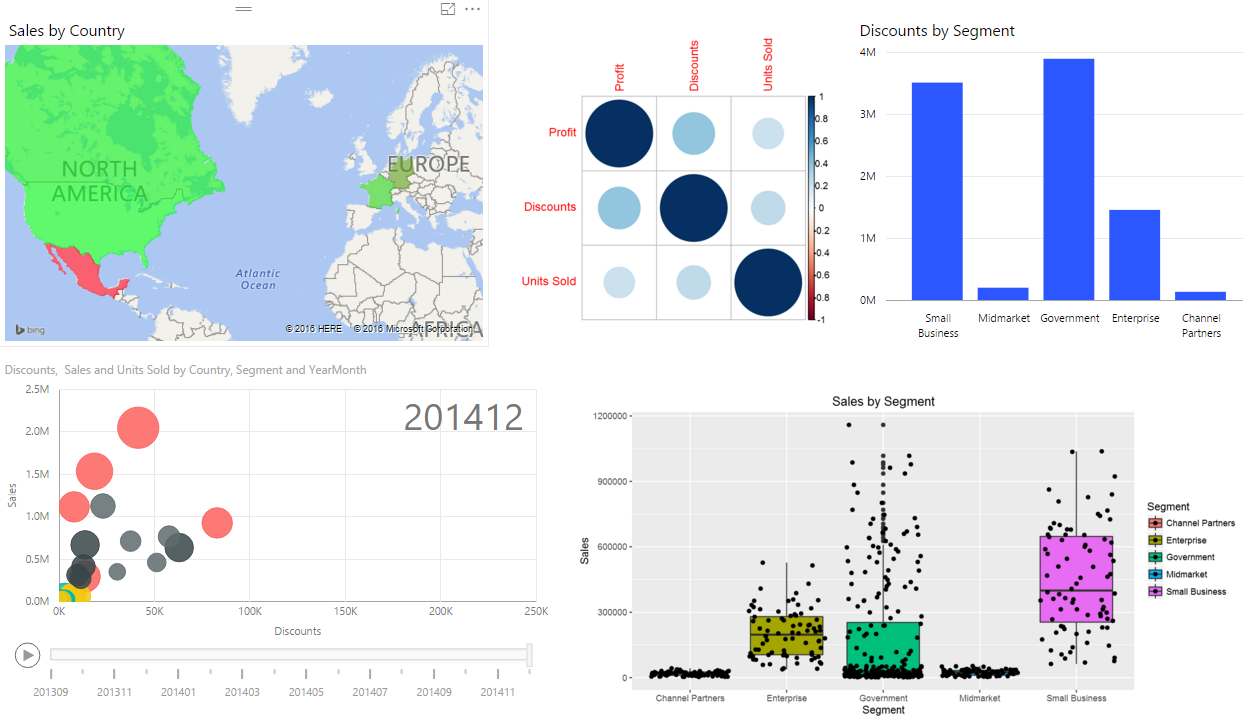
library(ggplot2)

qplot(Segment, Sales, data=dataset, geom=c("boxplot", "jitter"), fill=Segment, main="Sales by Segment", xlab="Segment", ylab="Sales")

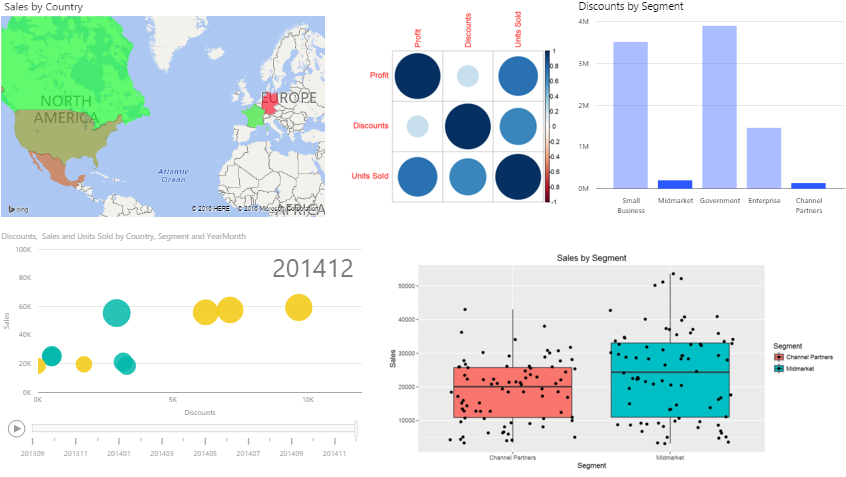
1. Click the play icon.



1. You should now have the following report, which uses regular Power BI charts with charts created by using R code.



1. Click the map and/or the others Power BI visuals to see that the R source is filtered and the visuals are updated to reflect the applied filter.



1. Save your report as **Lab3\_R\_Visials\_Final.pbix** in the **E:\Labs\M3Lab3** directory.
2. Close **Power BI Desktop**.