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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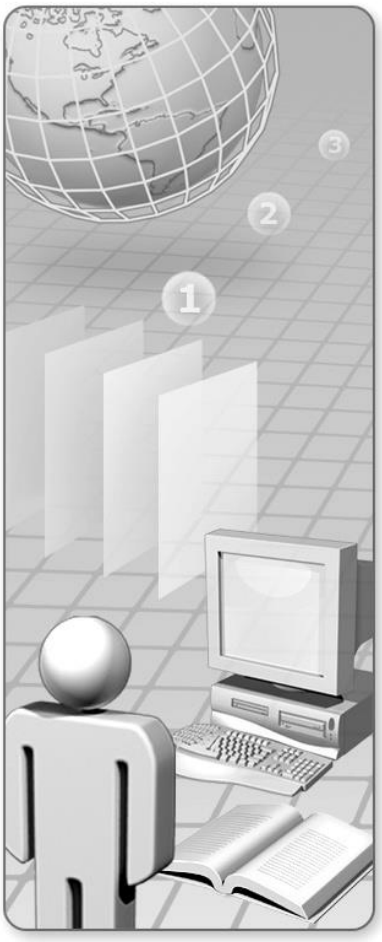
Module 3

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

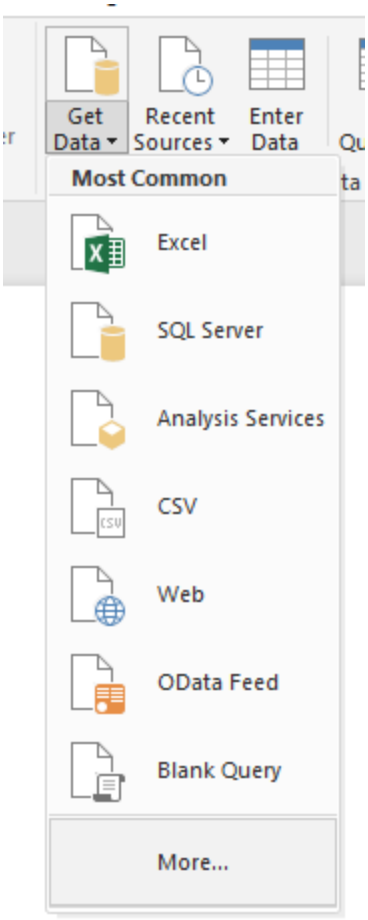
After completing this exercise, you will be able to:

- Create an analysis in Power BI using R data.

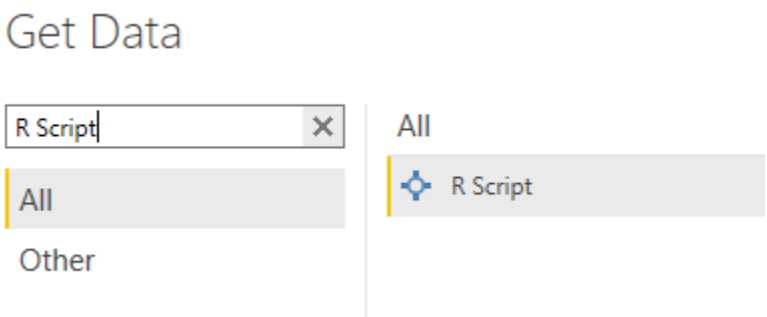
Using R as a Data Source

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**.



3. In the Search box, type **R Script**, and then click **Connect**.

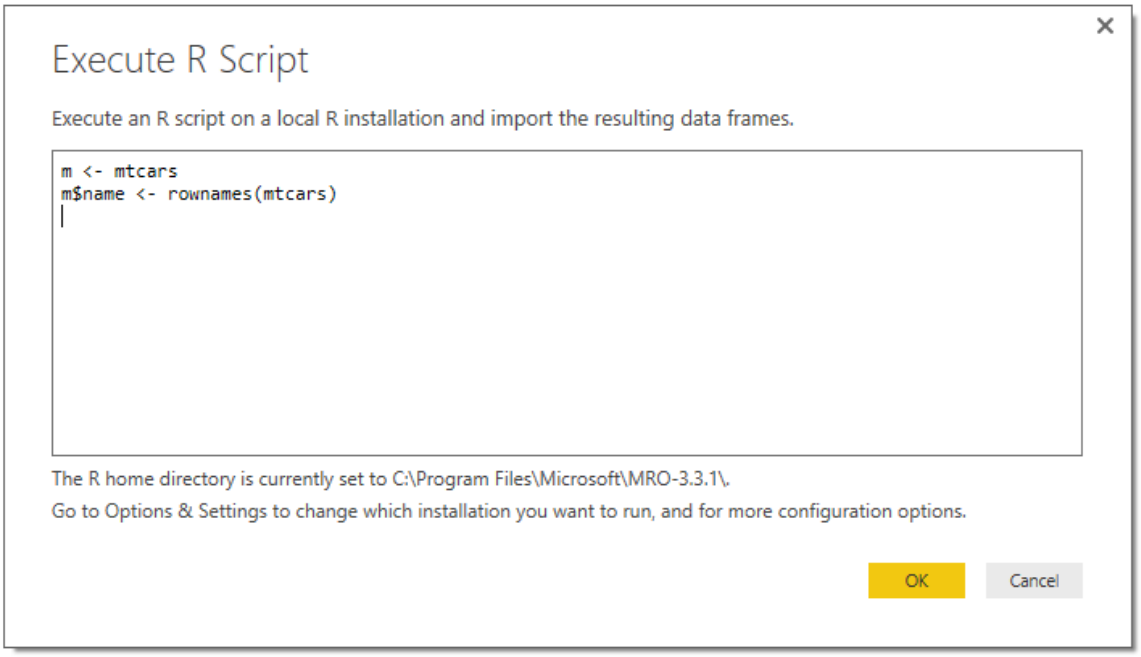


4. You should now see a window called **Execute R Script**. Input the following script to it.

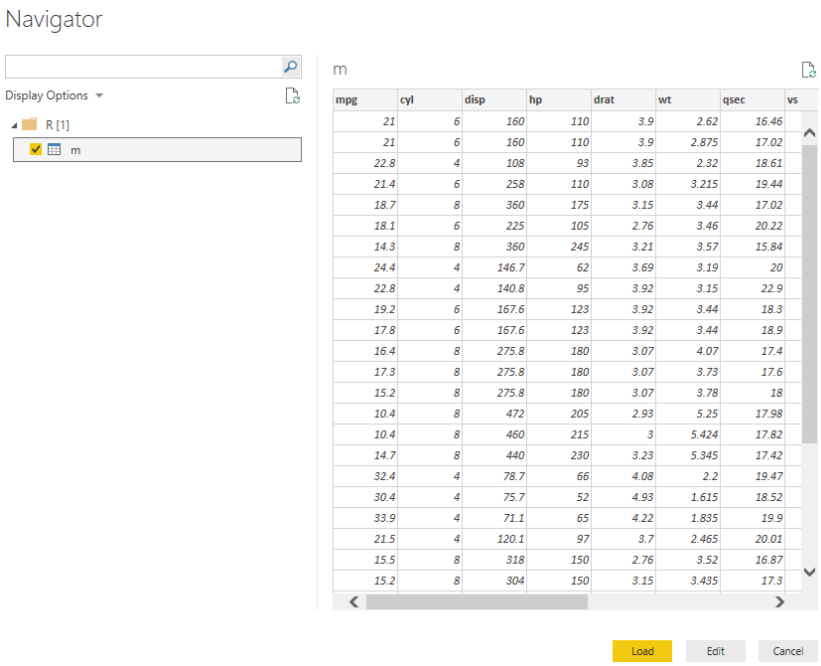
```
m <- mtcars
m$name <- rownames(mtcars)
```

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

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



6. 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.



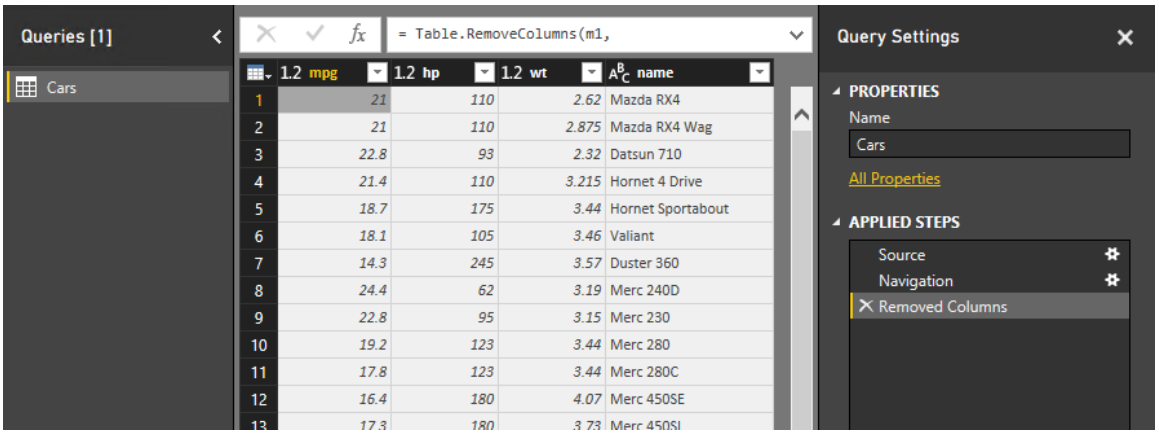
7. Click **Edit**.

8. In the **Query Settings** pane, change the name from **m** to **Cars**.

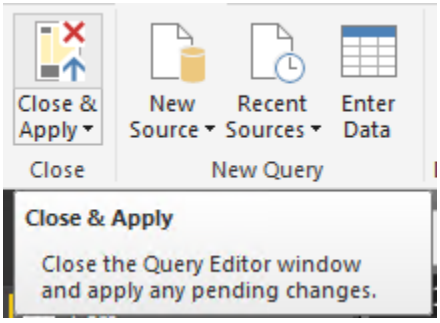
9. Remove the following columns from your query:

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

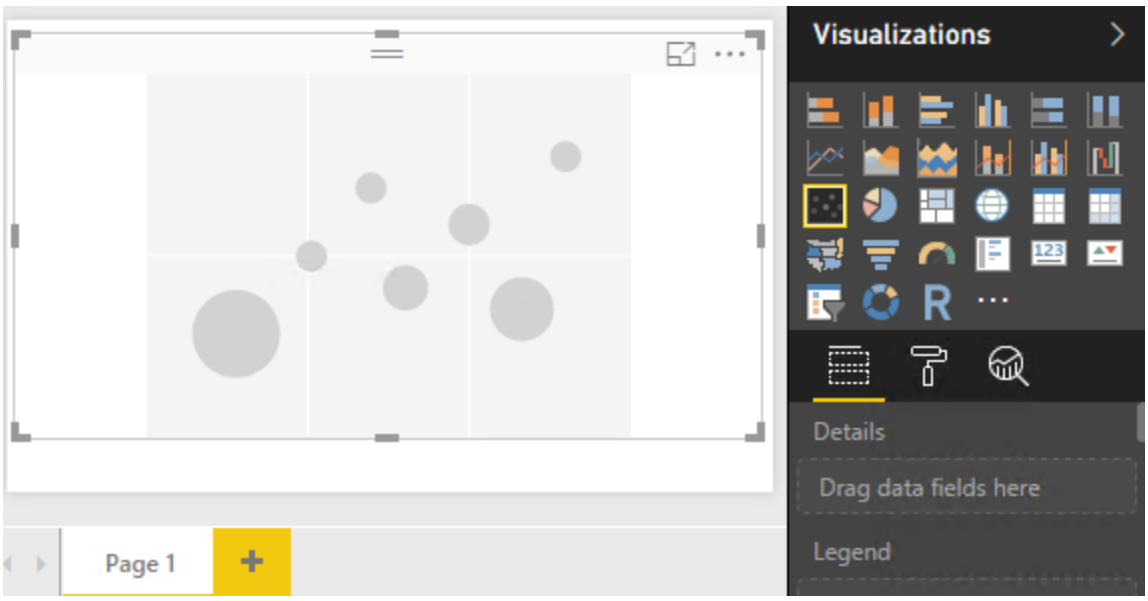
10. Your screen should be similar to the following screenshot:



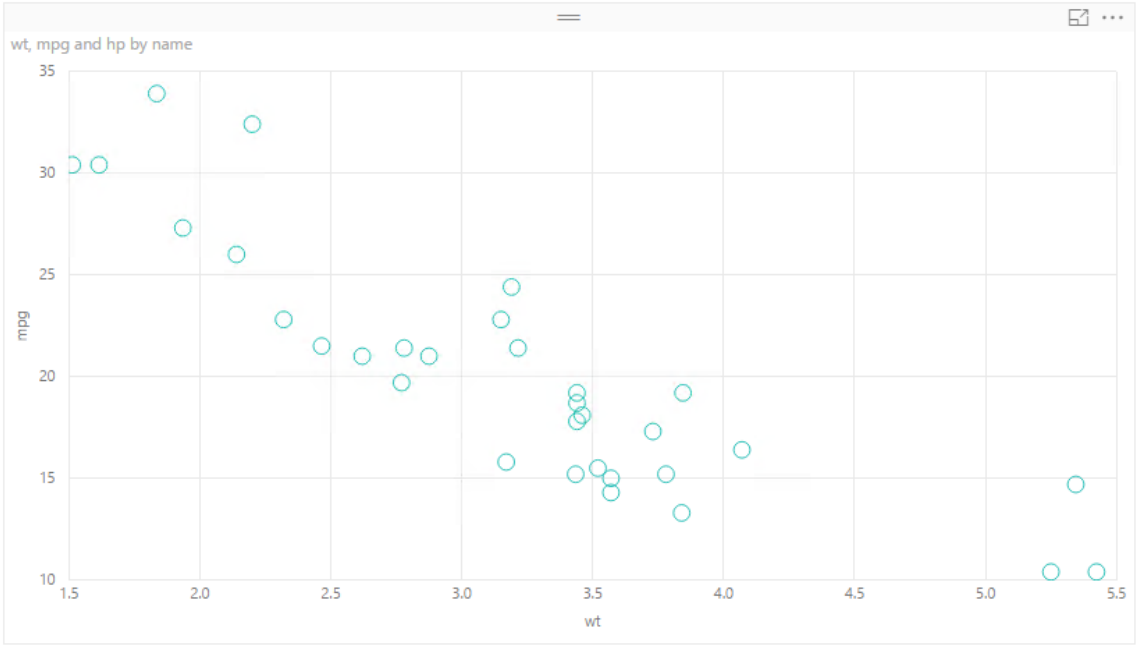
11. Click **Close & Apply**.



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



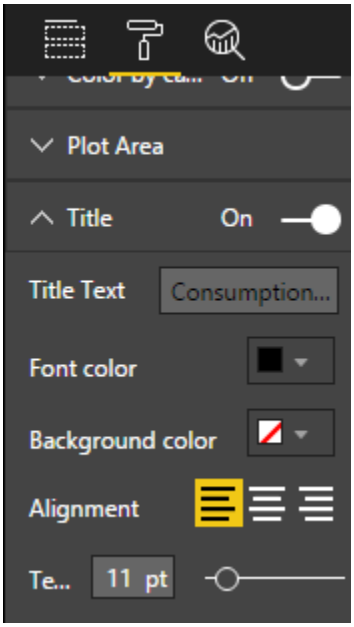
13. Add the field **name** to **Details**.
14. Add the field **wt** to **X Axis**.
15. Add the field **mpg** to **Y Axis**.
16. Add the field **hp** to **Tooltips**.
17. You should now have the following chart:



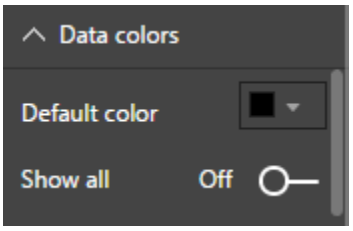
18. With the scatter chart selected, go to **Format** tab, expand **Title**, and change the **Title Text** property to **Consumption by weight**.

19. Change the **Font color** to **black**.

20. Change the **Text size** property to **11 pt**.

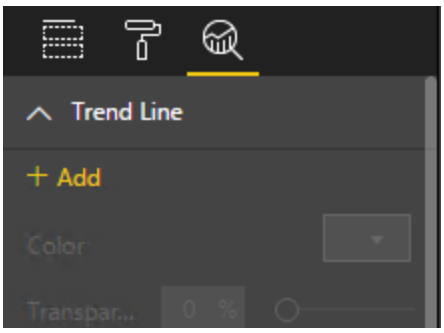


21. Still on **Format**, go to **Data colors**, and change the **Default color** to **black**,



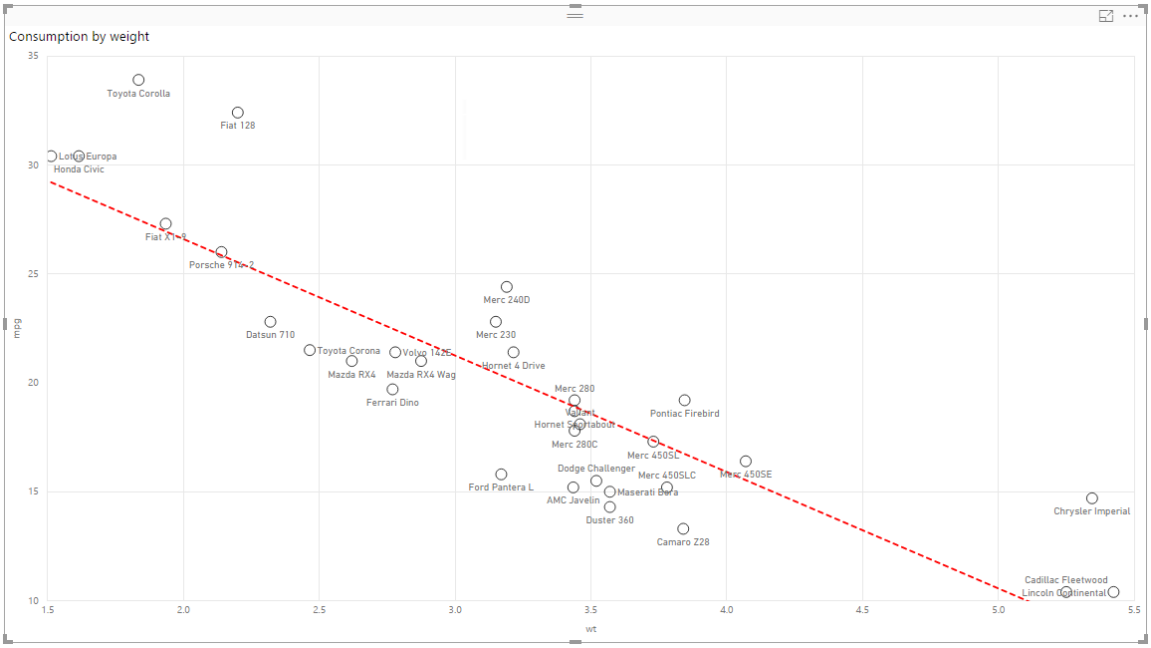
22. Locate **Category labels** and change it to **On**.

23. Select the **Analytics** pane (you must have the scatter chart selected). Search for **Trend Line** and click **+ Add**.



24. Change the color to **Red**.

25. Now you have a scatter chart that uses R to generate data, and is plotting a trend line (similar to a linear regression).



26. 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

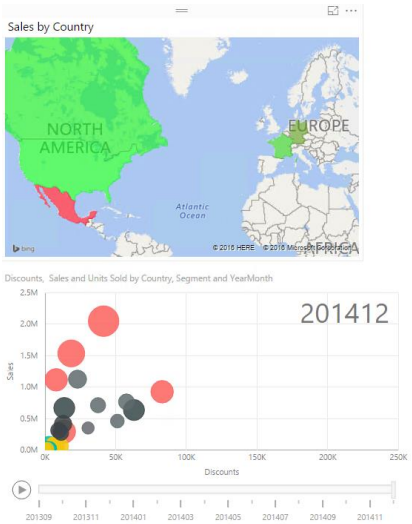
After completing this exercise, you will be able to:

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

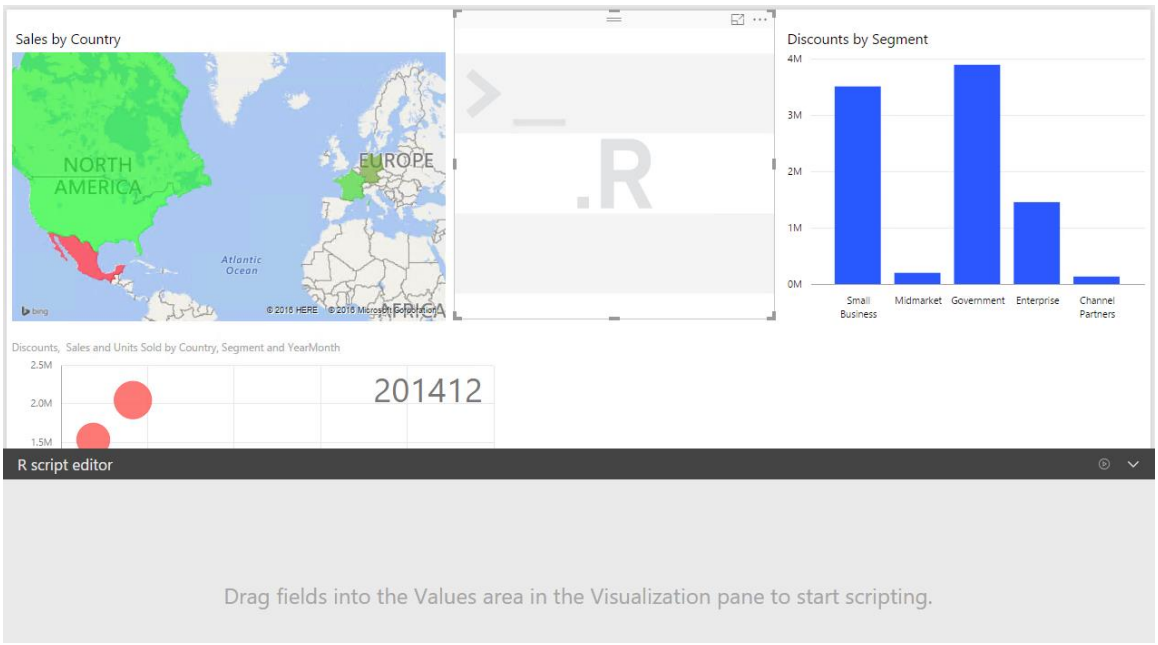
Using R Visuals

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:



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

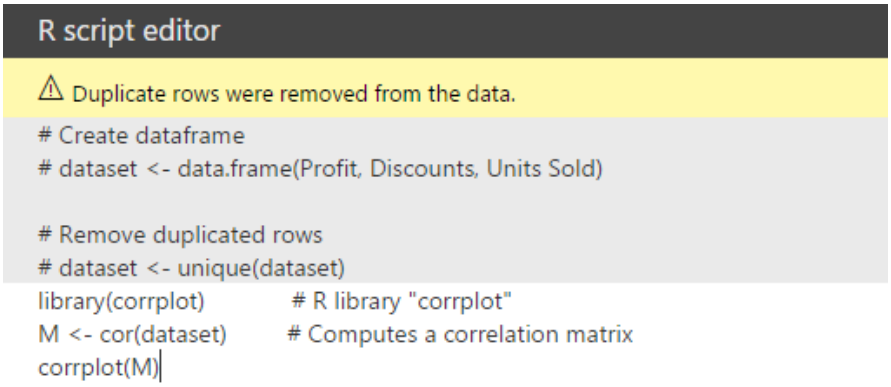


4. Drag the following fields to the **Values** property of the R visual. These values will compose the data frame available (called dataset) to you in the R script window:

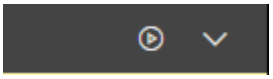
   Profit, **Discounts** and **Units Sold**.

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

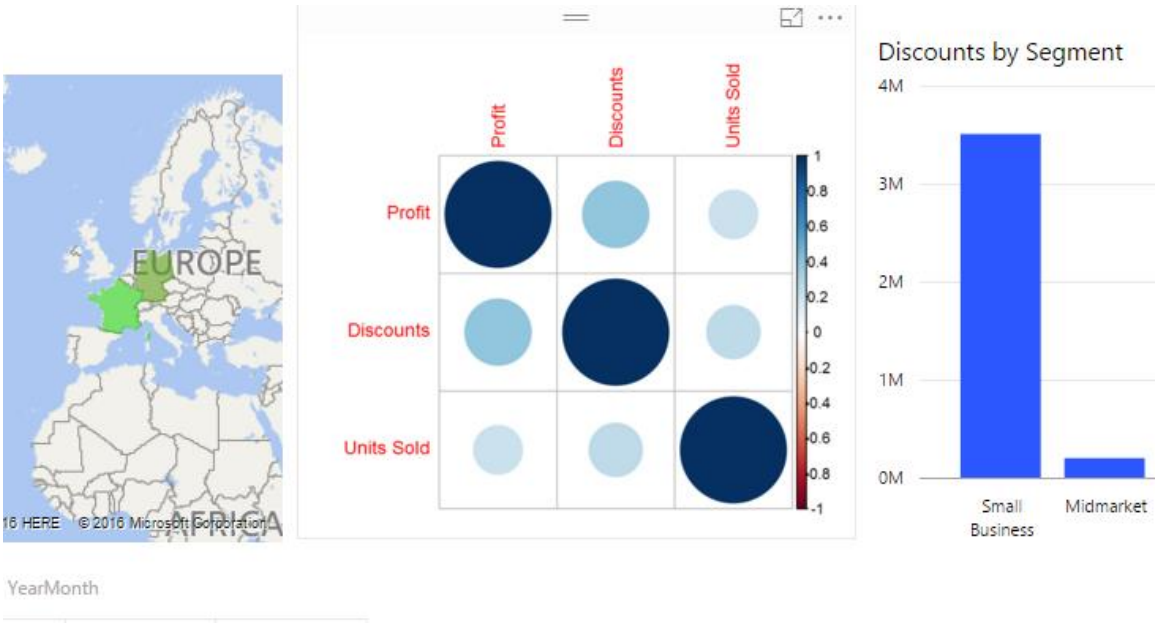
```
library(corrplot)          # R library "corrplot"
M <- cor(dataset)          # Computes a correlation matrix
corrplot(M)
```



6. Click the play icon.



7. You should see the following result:



8. Add another R visual to the region below the existing R visual and bar chart.

9. Drag the following fields to the **Values** property from the R visual you just added:

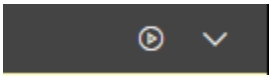
   Sales and **Segment**

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

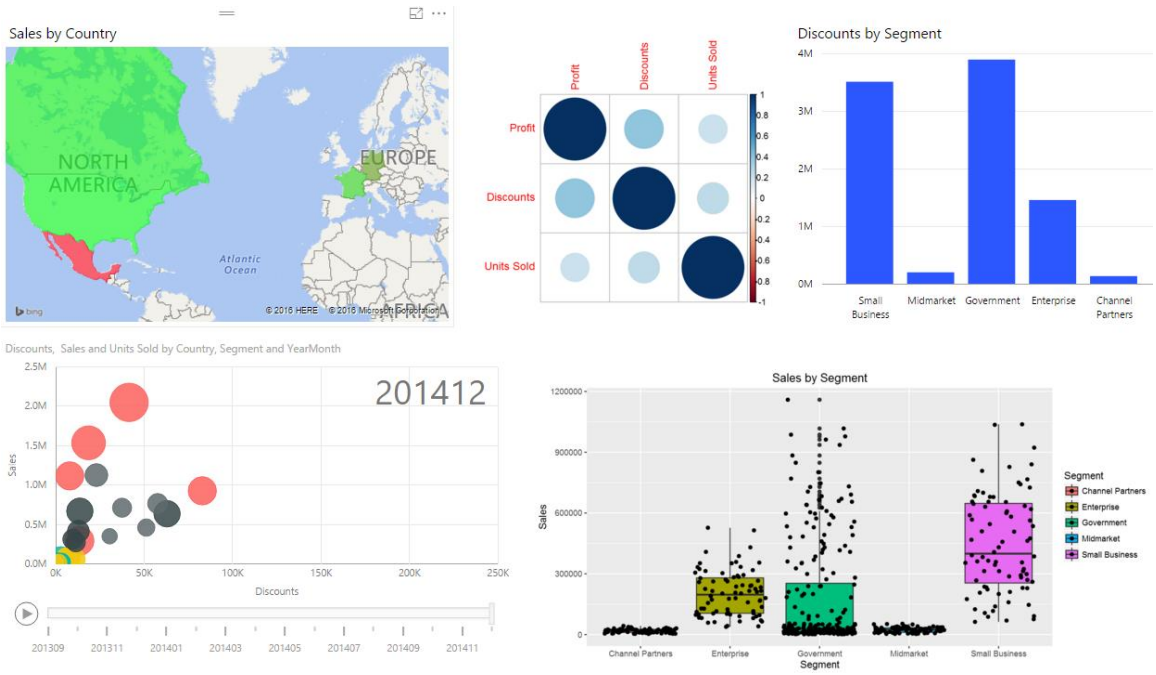
```
library(ggplot2)

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

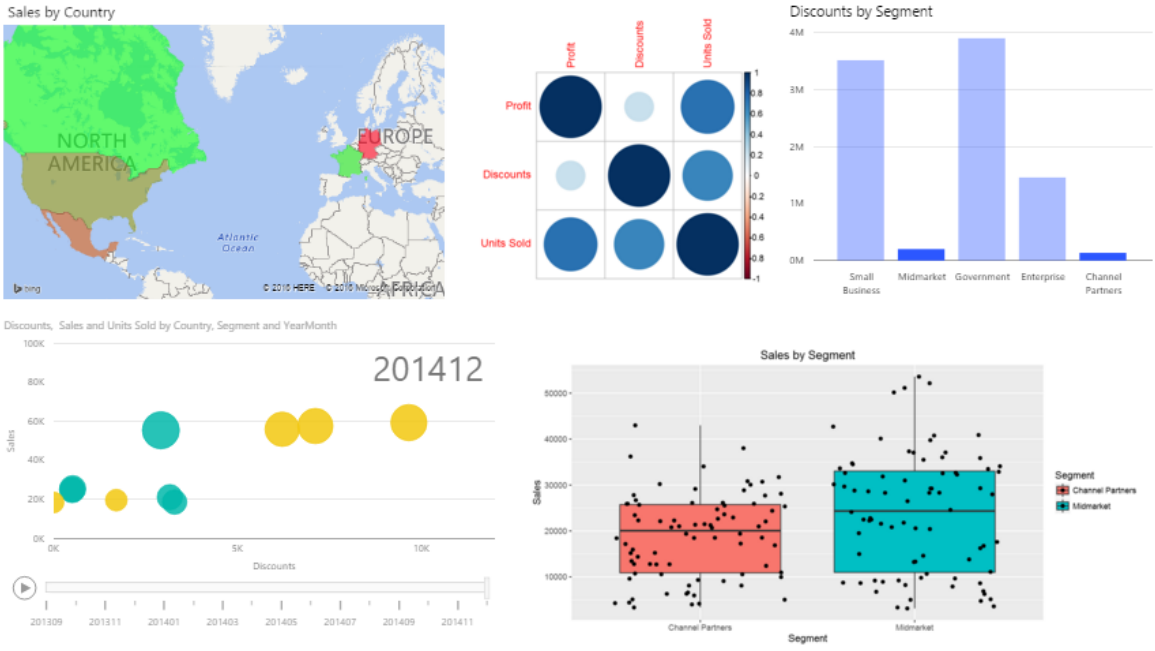
11. Click the play icon.



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



13. 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.



14. Save your report as **Lab3_R_Visials_Final.pbix** in the **E:\Labs\M3Lab3** directory.

15. Close **Power BI Desktop**.