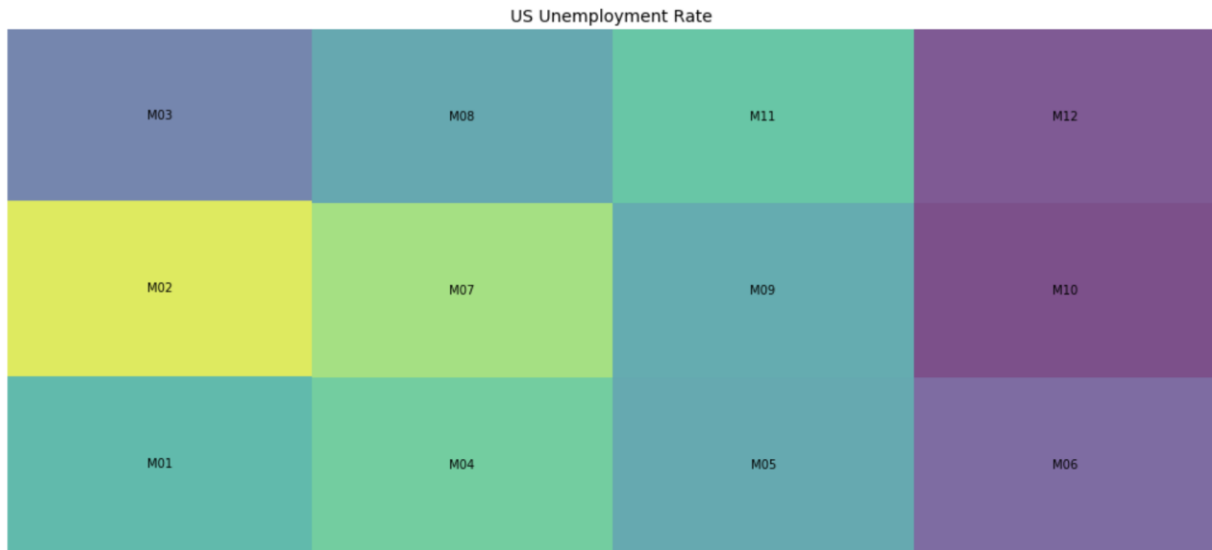


## Tree Map - Python

```
# group the values of Period
df_counts = df.groupby('Period').sum().reset_index()
# Plot Tree Map
plt.figure(figsize=(18,8))
squarify.plot(sizes=df_counts['Value'], label=df_counts['Period'], alpha=.7)
plt.axis('off')
plt.title('US Unemployment Rate', fontsize=14)
plt.show()
```



### Background Information:

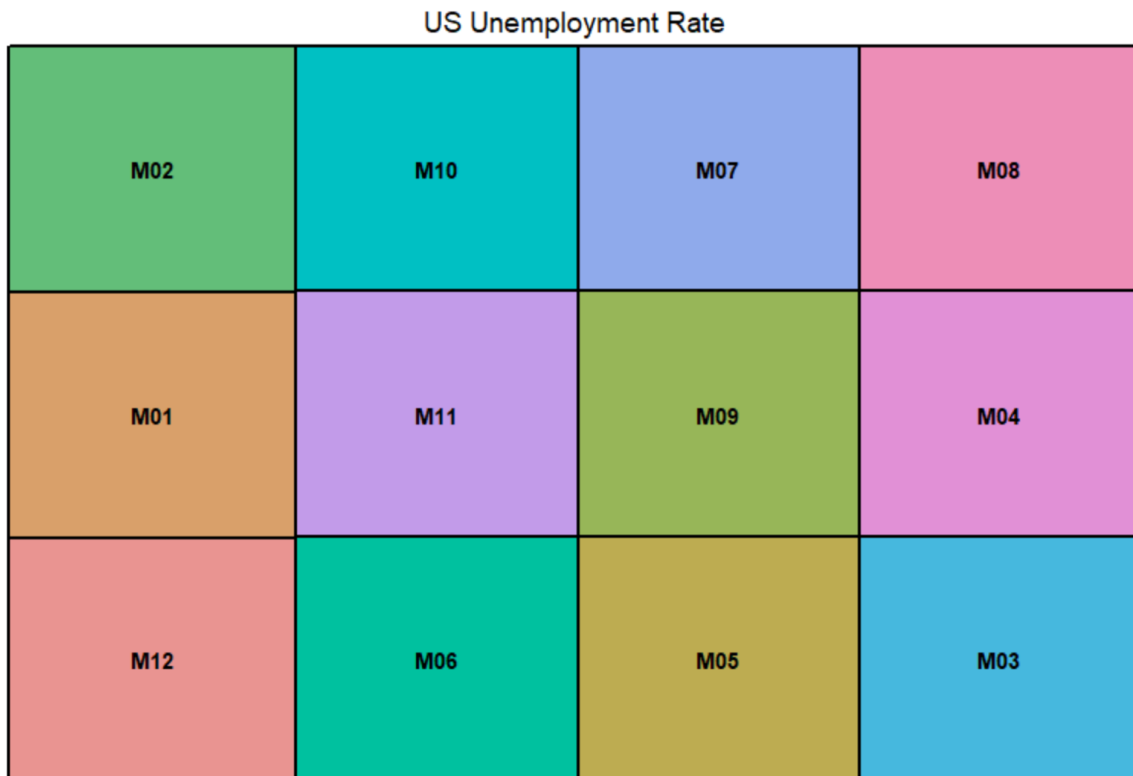
A Tree map is created by using Python – Matplotlib. The data set is the unemployment-rate-1948-2010 provided by the instructor. The data M01 to M12 represents twelve months from January to December. All values from each year have been added up and graphed as the y-variable. The months are the x-variable. Due to the differences between each month being very small, the sizes of the rectangles look very similar to each other; bigger rectangles represent higher values.

### Method:

- Load the libraries and the dataset into a data frame
- Group the values of all the years together for the y-variable
- Plot the months as x-variable against the values corresponding to the months as y-variable
- Using the squarify() function to graph the Tree Map

## Tree Map - R

```
1 # load data
2 data <- read.csv('unemployment-rate-1948-2010.csv')
3
4 # group the values for each period
5 aggregate(data$value, by=list(Category=data$Period), FUN=sum)
6
7 # load library
8 library(treemap)
9
10 # treemap in R
11 treemap(data, index="Period", vSize="Value", type="index", title="US Unemployment Rate")
12
```



Background Information:

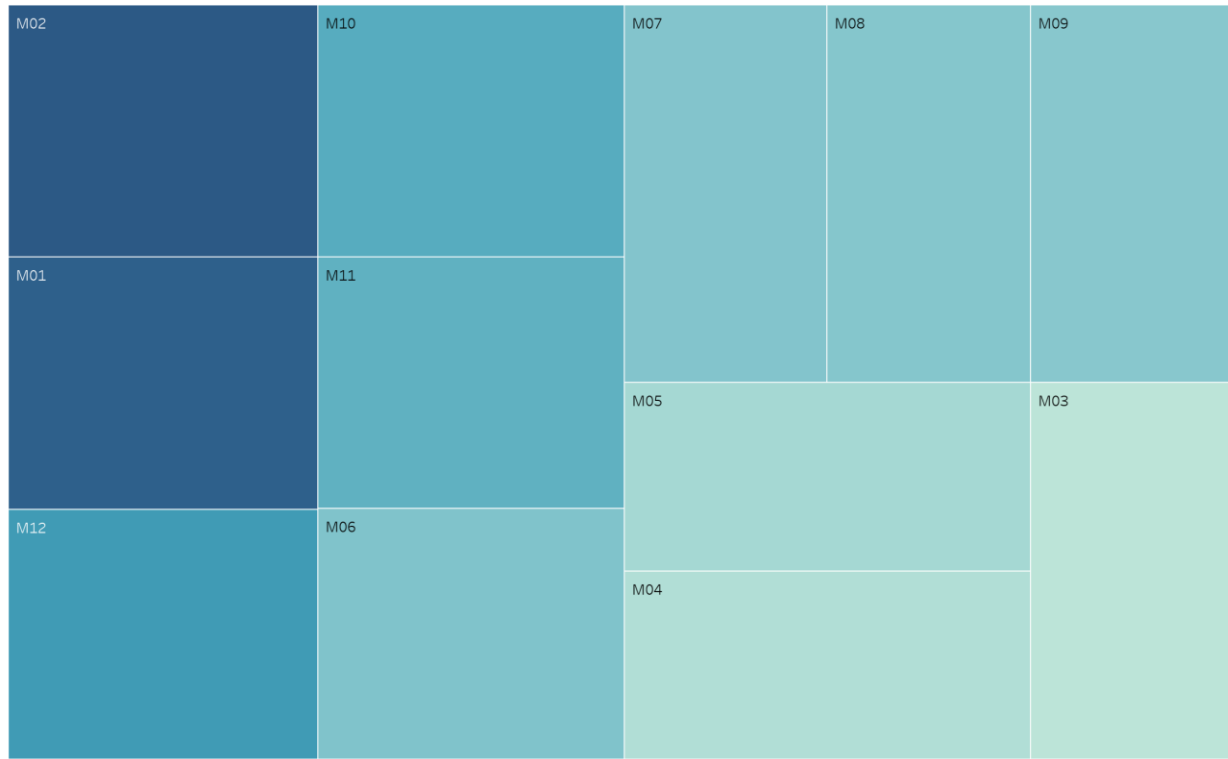
A Tree map is created by using R and the treemap package. All information here is similar to the aforementioned in the Python section.

Method:

- Load the libraries and the dataset into a data frame
- Group the values of all the years together for the y-variable using the aggregate() function
- Plot the months as x-variable against the values corresponding to the months as y-variable
- Using the treemap() function to graph the Tree Map

## Tree Map – Tableau

US Employment Rate



Background Information:

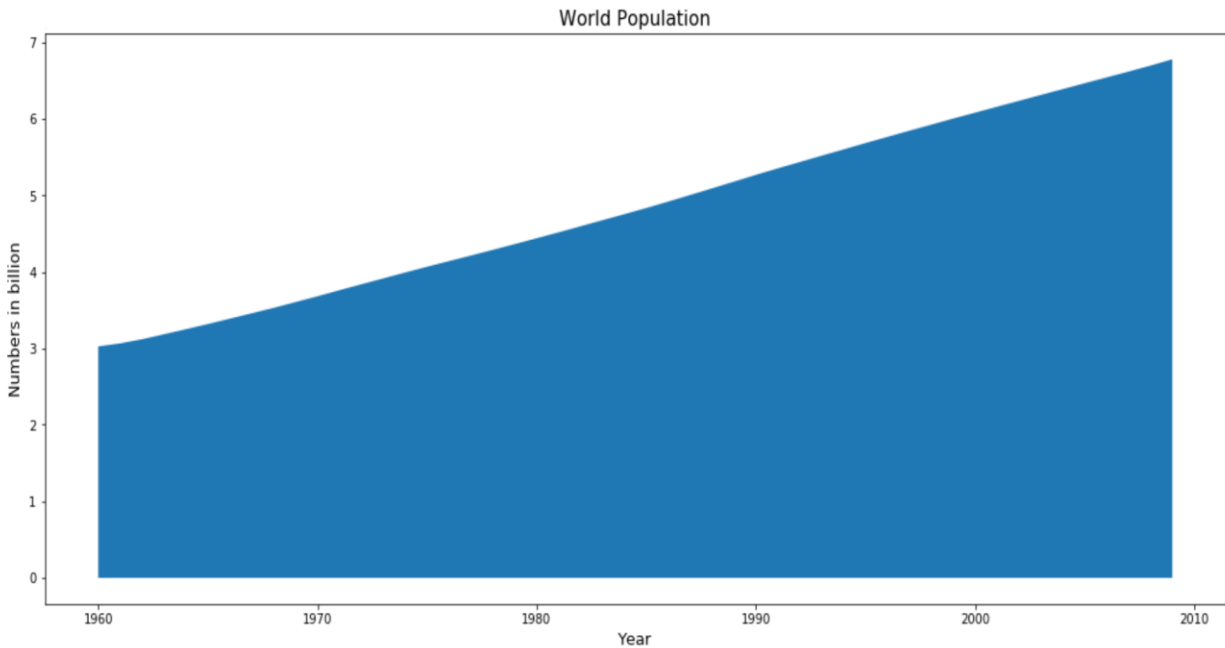
A Tree map is created by using Tableau. All information here is similar to the aforementioned in the Python and R section.

Method:

- Load the unemployment-rate csv file as the data source
- Go to Sheet1
- Select the Treemap on the “Show me” tab
- Drag the Period into the Column
- Drag the Value into the Row
- Adjust the title

## Area Chart - Python

```
plt.figure(figsize=(18,8))
plt.fill_between(df2['Year'], df2['Population'])
plt.title('World Population', fontsize=15)
plt.ylabel("Numbers in billion", fontsize=13)
plt.xlabel("Year", fontsize=13)
plt.show()
```



### Background Information:

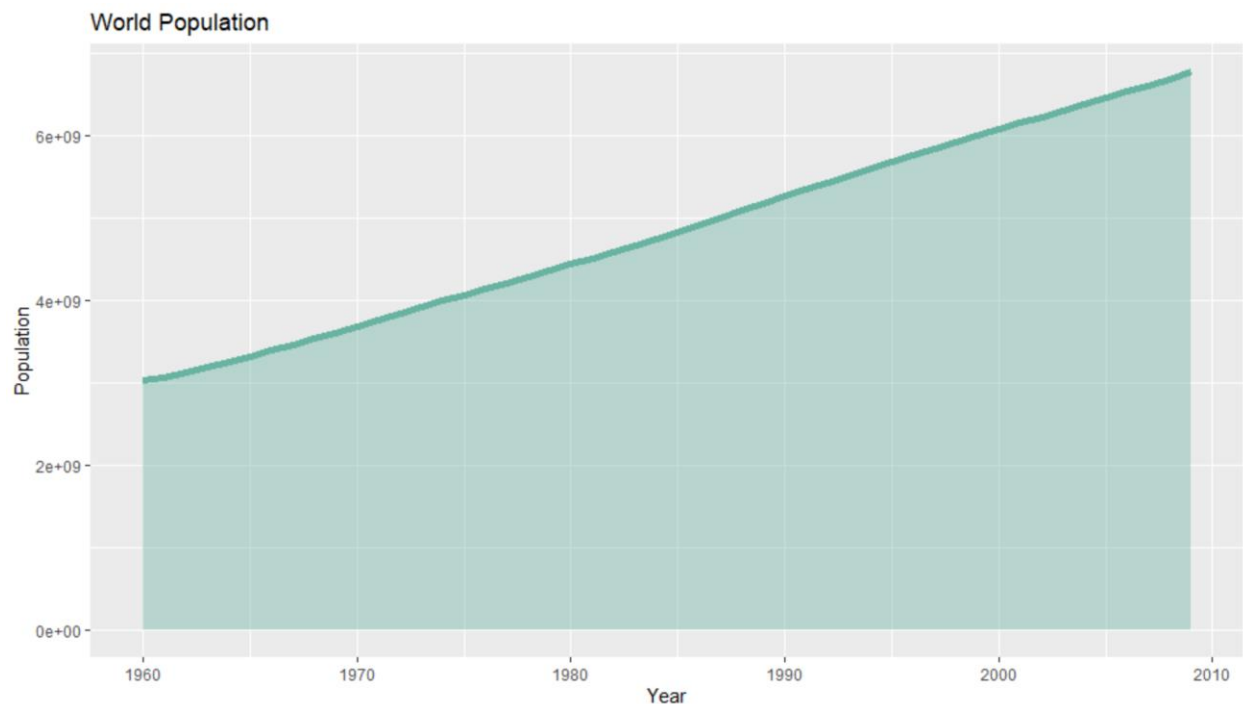
An Area Chart is created by using Python with matplotlib package. The data set is world-population.xlsm provided by the instructor. This data set shows how the world population changes over year from 1960 to 2010. Year is the x-variable, and the number of people is the y-variable. As shown in the area chart, the world population has been increasing steadily over 50 years.

### Method:

- Load the libraries and the dataset into a data frame
- Use the fill\_between() function from Matplotlib to graph the area chart
- Add the labels for the title, x-axis and y-axis

## Area Chart – R

```
15 # load library
16 library(ggplot2)
17 library(readxl)
18
19 # load data
20 pop <- read_excel("world-population.xlsx")
21 Year <- pop$Year
22 Population <- pop$Population
23 # plot area chart
24 ggplot(pop, aes(x=Year, y=Population)) +
25   geom_area(fill="#69b3a2", alpha=0.4) +
26   geom_line(color="#69b3a2", size=2) +
27   geom_point(size=2, color="#69b3a2") +
28   ggtitle("World Population")
29
```



### Background Information:

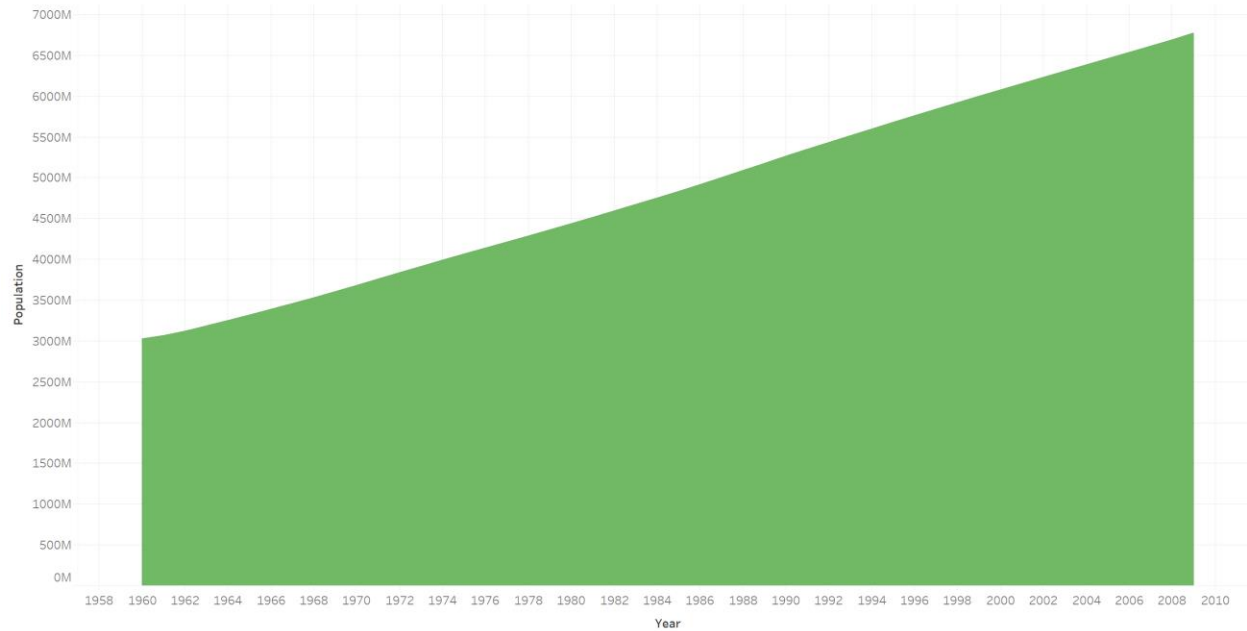
An Area Chart is created by using R with ggplot2 package. The data set and background information are similar to the ones mentioned in the Python section.

### Method:

- Load the libraries and the dataset into a data frame
- Use the ggplot() function from ggplot2 package and the geom\_area() to graph the area chart
- Add the labels for the title, x-axis and y-axis

## Area Chart – Tableau

World Population



### Background Information:

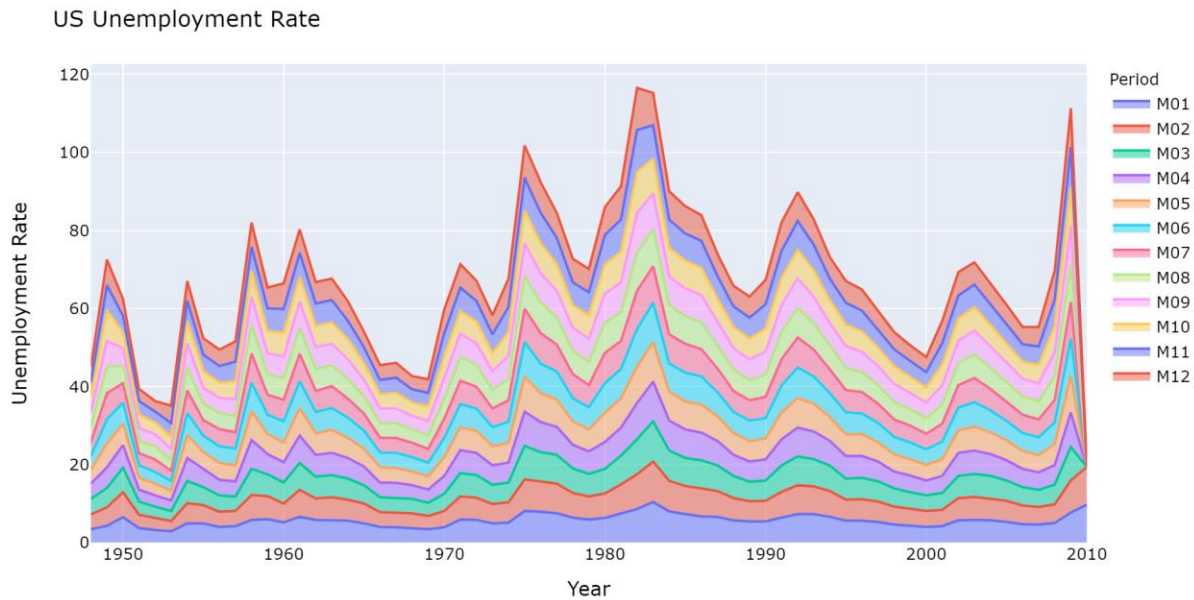
An Area Chart is created by using Tableau. The data set and background information are similar to the ones mentioned in the Python and R section.

### Method:

- Load the world-population.xlsm file as the data source
- Go to Sheet1
- Select the Area Chart on the “Show me” tab
- Drag the Year into the Column
- Drag the Population into the Row
- Adjust the title

## Stacked Area Charts – Python

```
# Plotly Stacked Area Chart
fig = px.area(df, x="Year", y="Value", color="Period")
fig.update_layout(
    title="US Unemployment Rate",
    xaxis_title="Year",
    yaxis_title="Unemployment Rate",
    font=dict(
        size=13,
        color="black"
    )
)
fig.show()
```



### Background Information:

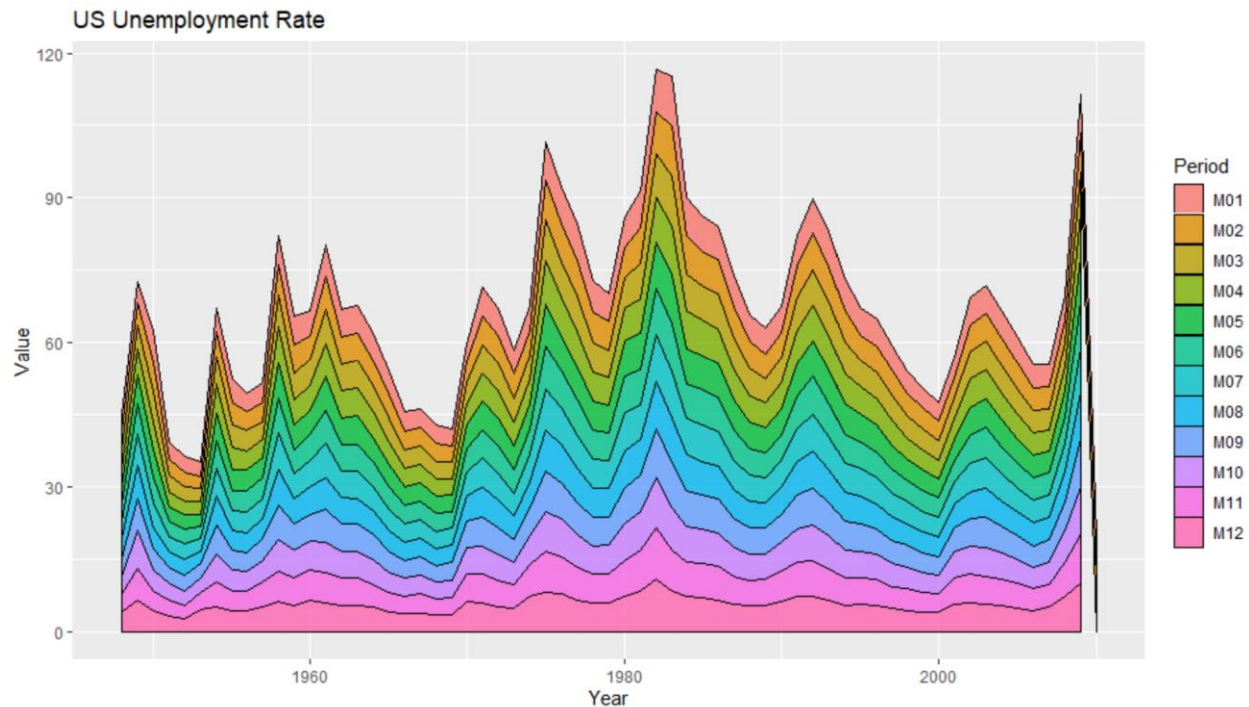
A stacked area chart is created by using Python – Plotly. The data set is the unemployment-rate-1948-2010 provided by the instructor. The data M01 to M12 represents twelve months from January to December. X-axis contains the years. Y-axis contains the unemployment rates. Each area color represents each month of the year. The legend on the upper-right hand explains the color codes.

### Method:

- Load the libraries and the dataset into a data frame
- Group the values of all the years together for the y-variable
- Plot the years as x-variable against the values corresponding to the months as y-variable
- Using the `px.area()` function to graph the Stacked Area Chart

## Stacked Area Charts – R

```
36 # load library
37 library(dplyr)
38 # plot stacked area chart
39 ggplot(data, aes(x=Year, y=Value, fill=Period))+
40   geom_area(alpha=0.8 , size=0.1, colour="black") +
41   ggtitle('US Unemployment Rate')
42
```



### Background Information:

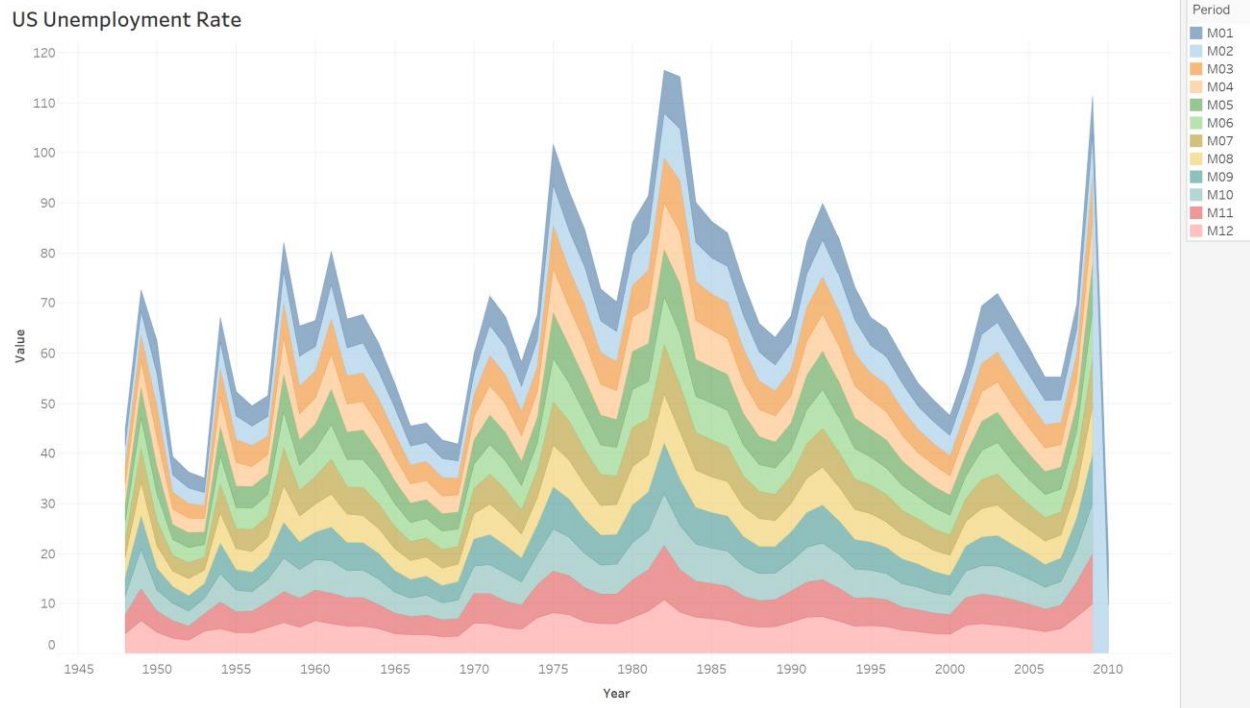
A stacked area chart is created by using R – ggplot2 & dplyr packages. The data set is the unemployment-rate-1948-2010 provided by the instructor. The data M01 to M12 represents twelve months from January to December. X-axis contains the years. Y-axis contains the unemployment rates. Each area color represents each month of the year. The legend on the upper-right hand explains the color codes.

### Method:

- Load the libraries and the dataset into a data frame
- Group the values of all the years together for the y-variable
- Plot the years as x-variable against the values corresponding to the months as y-variable
- Using the ggplot() and geom\_area() function to graph the Stacked Area Chart



## Stacked Area Charts – Tableau



### Background Information:

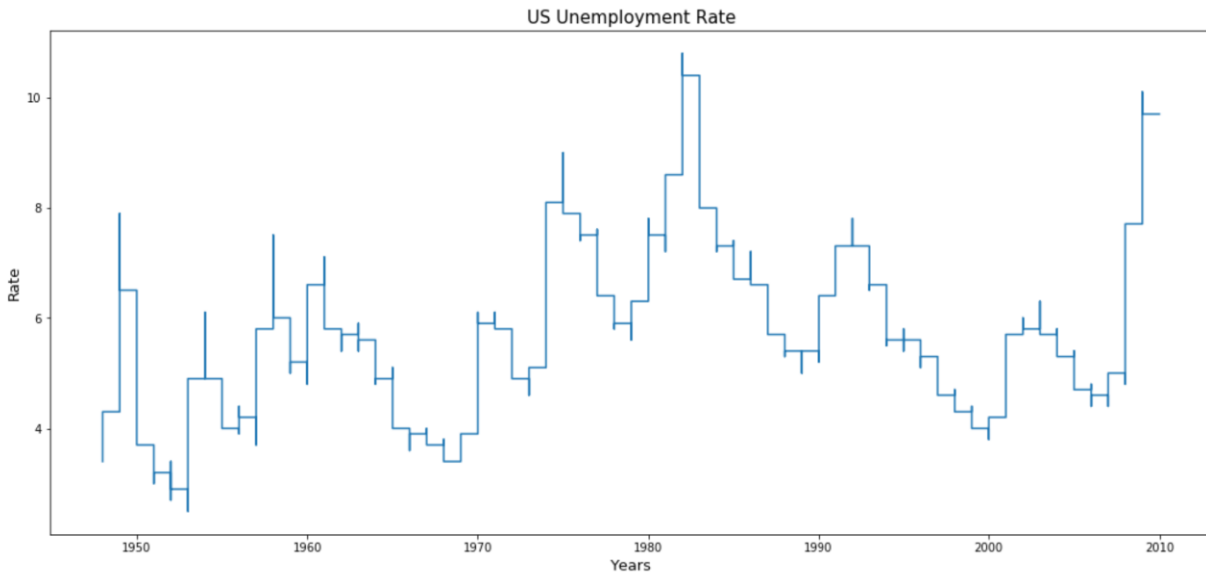
A stacked area chart is created by using Tableau. The data set is the unemployment-rate-1948-2010 provided by the instructor. The data M01 to M12 represents twelve months from January to December. X-axis contains the years. Y-axis contains the unemployment rates. Each area color represents each month of the year. The legend on the upper-right hand explains the color codes.

### Method:

- Load the unemployment csv file as the data source
- Select the Area Chart on the “Show Me” tab
- Drag the Year into the “Column” area
- Drag the Value into the “Row” area
- Drag the Value into the “color” box
- Adjust the title

## Step Charts - Python

```
plt.figure(figsize=(18,8))
plt.step(df['Year'], df['Value'])
plt.title('US Unemployment Rate', fontsize=15)
plt.ylabel("Rate", fontsize=13)
plt.xlabel("Years", fontsize=13)
plt.show()
```



### Background Information:

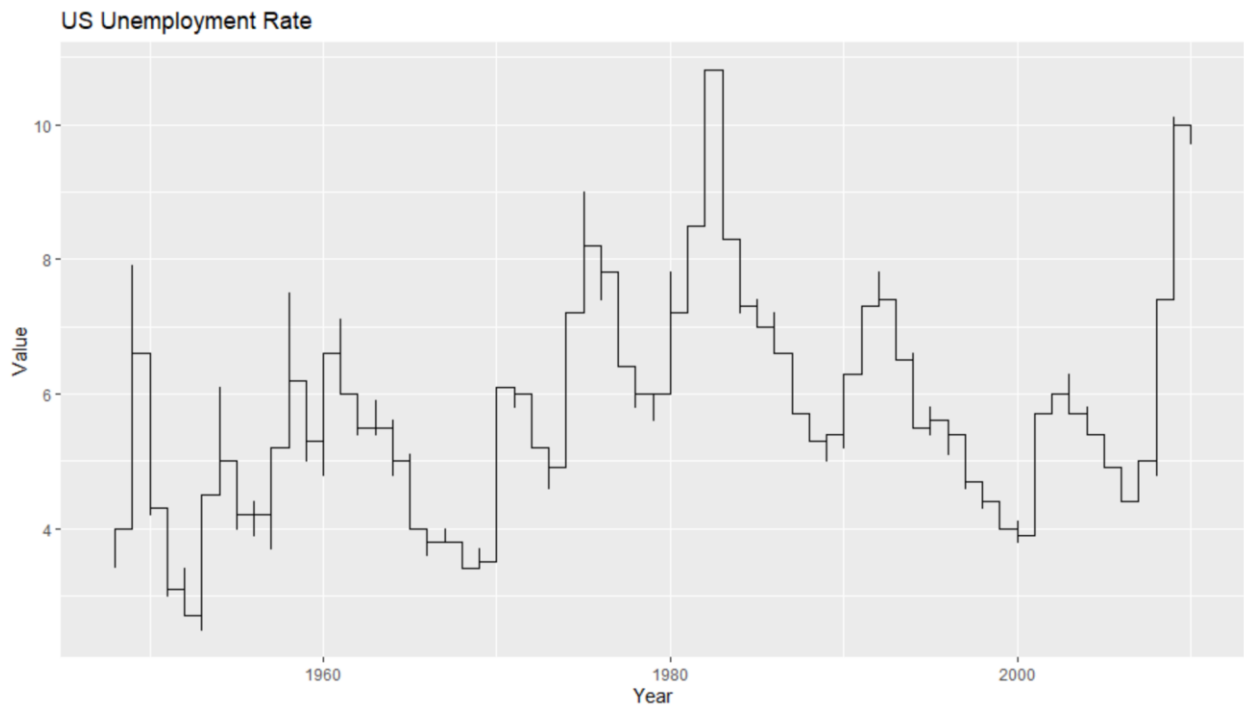
A step chart is created by using Python with Matplotlib package. The data set is the unemployment-rate-1948-2010 provided by the instructor. The data M01 to M12 represents twelve months from January to December. X-axis contains the years. Y-axis contains the unemployment rates. From the chart, we can see the movement of the unemployment rate throughout sixty years.

### Method:

- Load the libraries and the dataset into a data frame
- Group the values of all the years together for the y-variable
- Plot the years as x-variable against the values corresponding to the months as y-variable
- Using the step() function to graph the Step Chart

## Step Charts – R

```
40 # Step Chart
41 ggplot(data=data, aes(x=Year, y=Value)) +
42   geom_step() +
43   ggtitle("US Unemployment Rate")
44
```



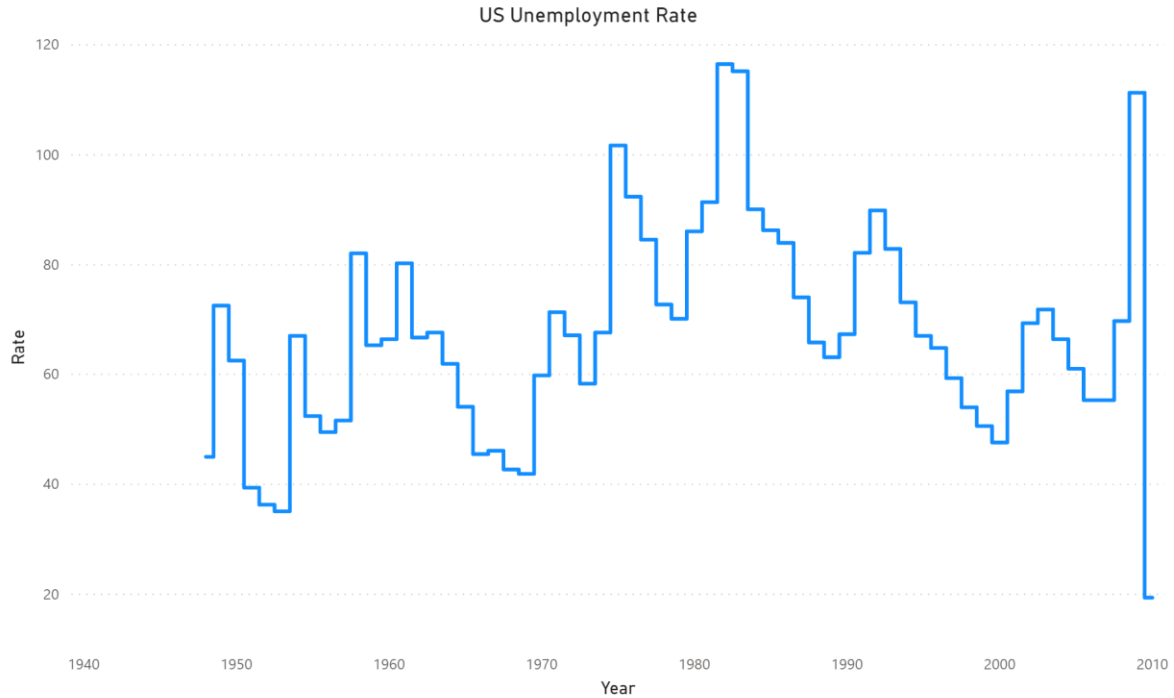
### Background Information:

A step chart is created by using R with ggplot2 package. The data set is the unemployment-rate-1948-2010 provided by the instructor. The data M01 to M12 represents twelve months from January to December. X-axis contains the years. Y-axis contains the unemployment rates. From the chart, we can see the movement of the unemployment rate throughout sixty years.

### Method:

- Load the libraries and the dataset
- Group the values of all the years together for the y-variable
- Plot the years as x-variable against the values corresponding to the months as y-variable
- Using the ggplot() and geom\_step() function to graph the Step Chart

## Step Charts – Power BI



### Background Information:

A step chart is created by using Power BI. The data set is the unemployment-rate-1948-2010 provided by the instructor. The data M01 to M12 represents twelve months from January to December. X-axis contains the years. Y-axis contains the unemployment rates. From the chart, we can see the movement of the unemployment rate throughout sixty years.

### Method:

- Load the data
- Select the line chart
- Drag the Year into the Axis box
- Drag the Value into the Values box
- Click on the chart and go to format
- Go to "Shape" and turn on the "Step" option