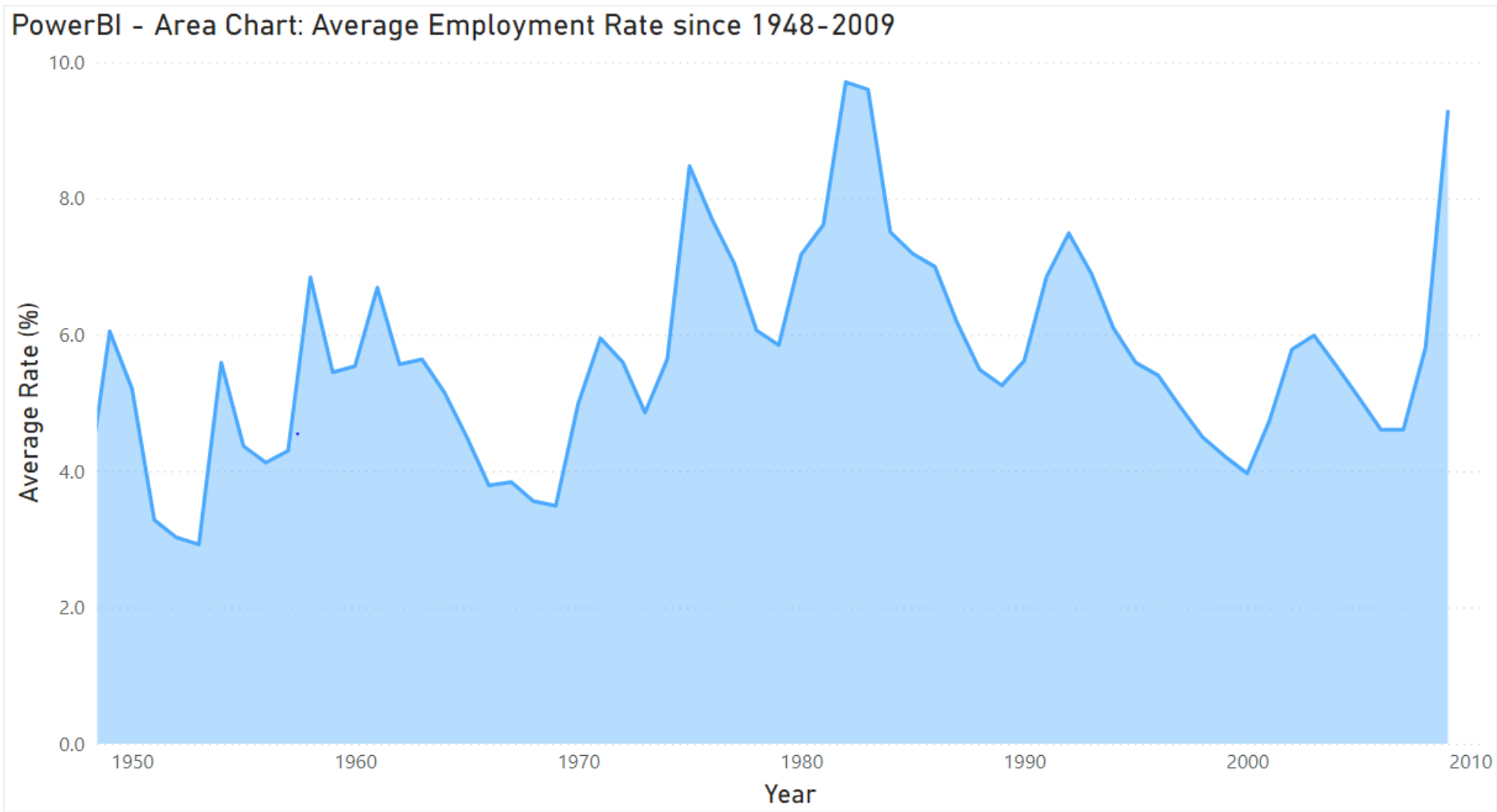


# Assignment 3.2 Charts

DSC640

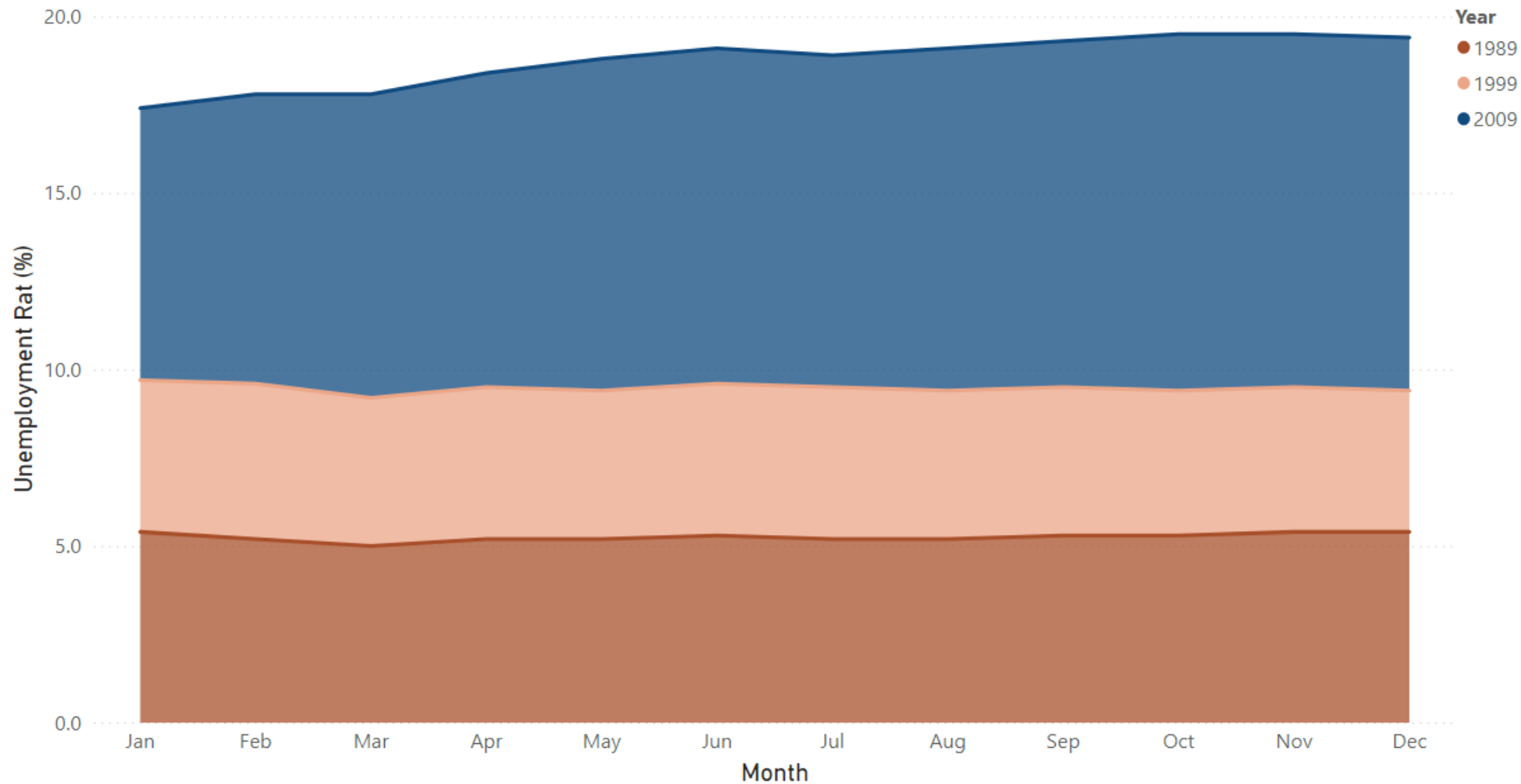
Taniya Adhikari

# PowerBI – Area Chart



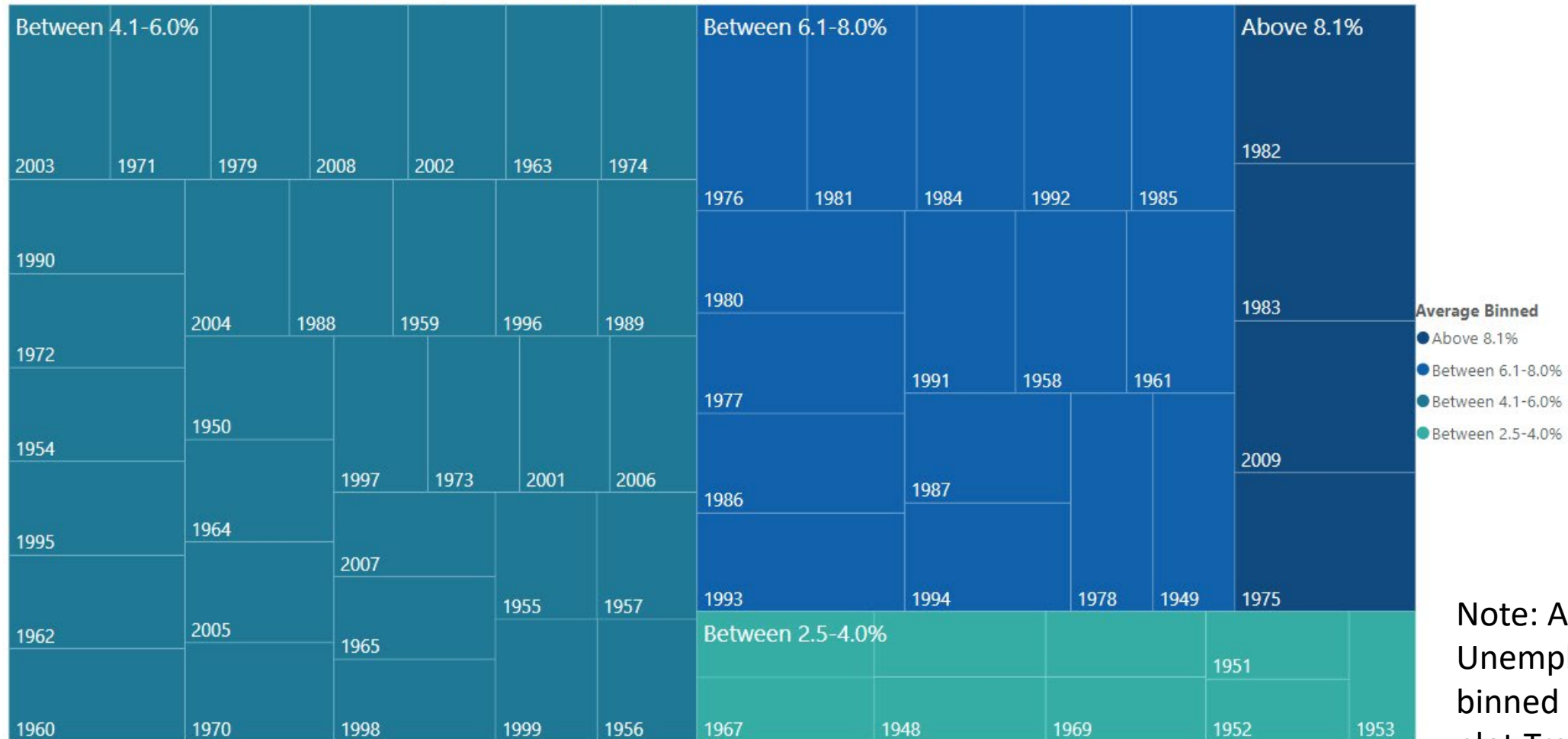
# PowerBI – Stacked Area Chart

PowerBI - Stacked Area Chart: Unemployment Rate Comparison of 1989, 1999, 2009



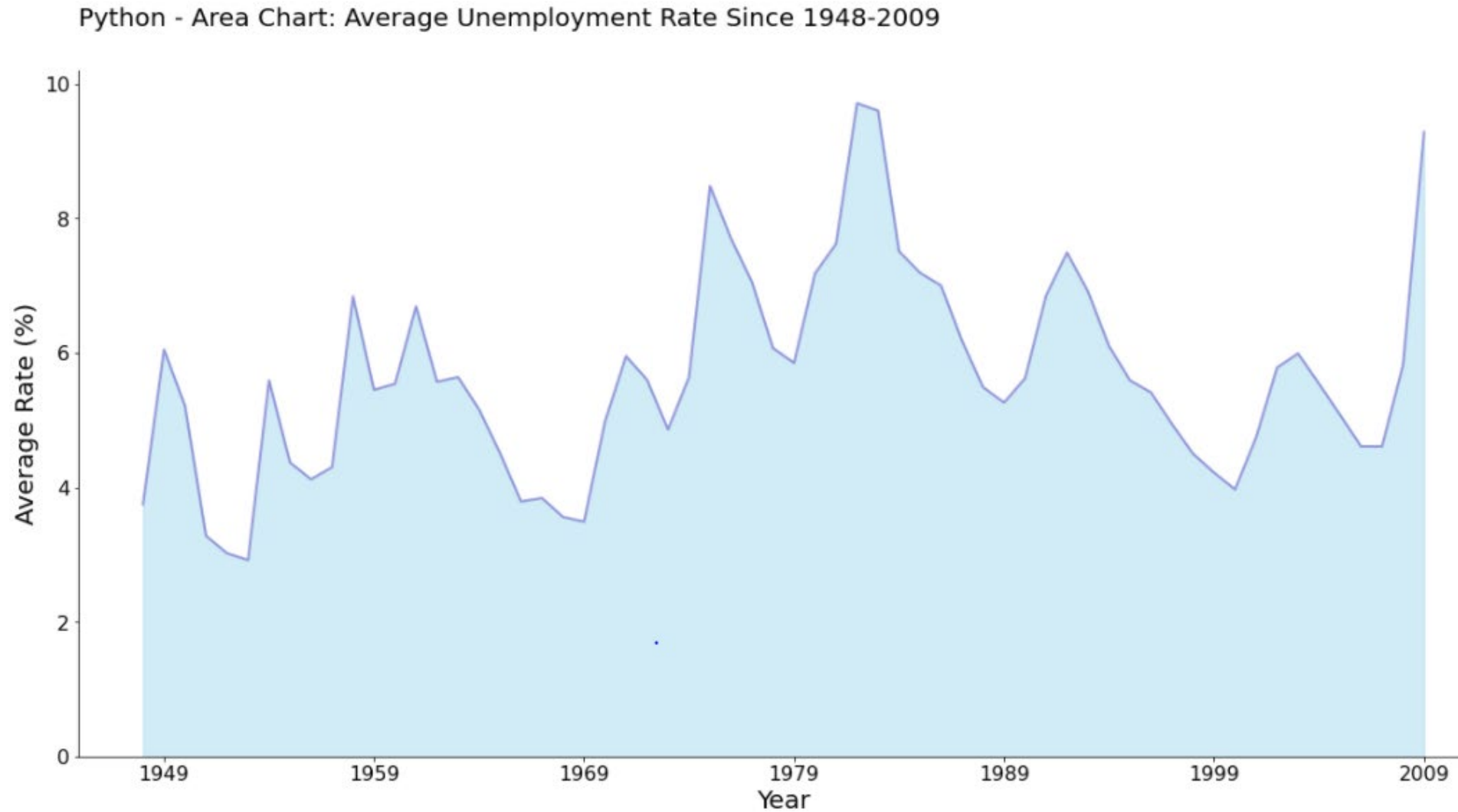
# PowerBI – Tree Map

PowerBI - Tree Map: Average Unemployment Rate Distribution from 1948-2009

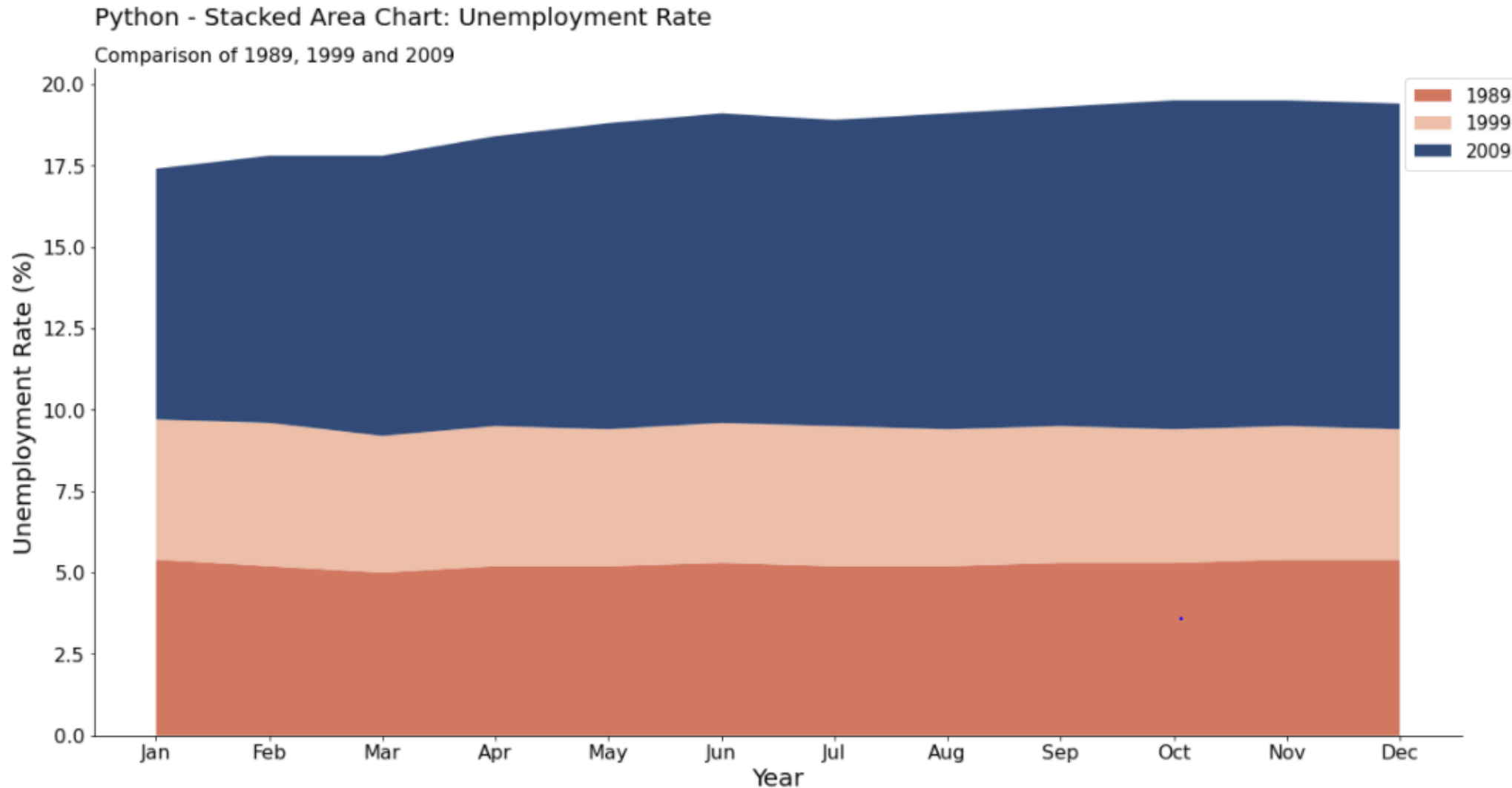


Note: Average Unemployment Rate is binned into categories to plot Tree Maps

# Python – Area Chart

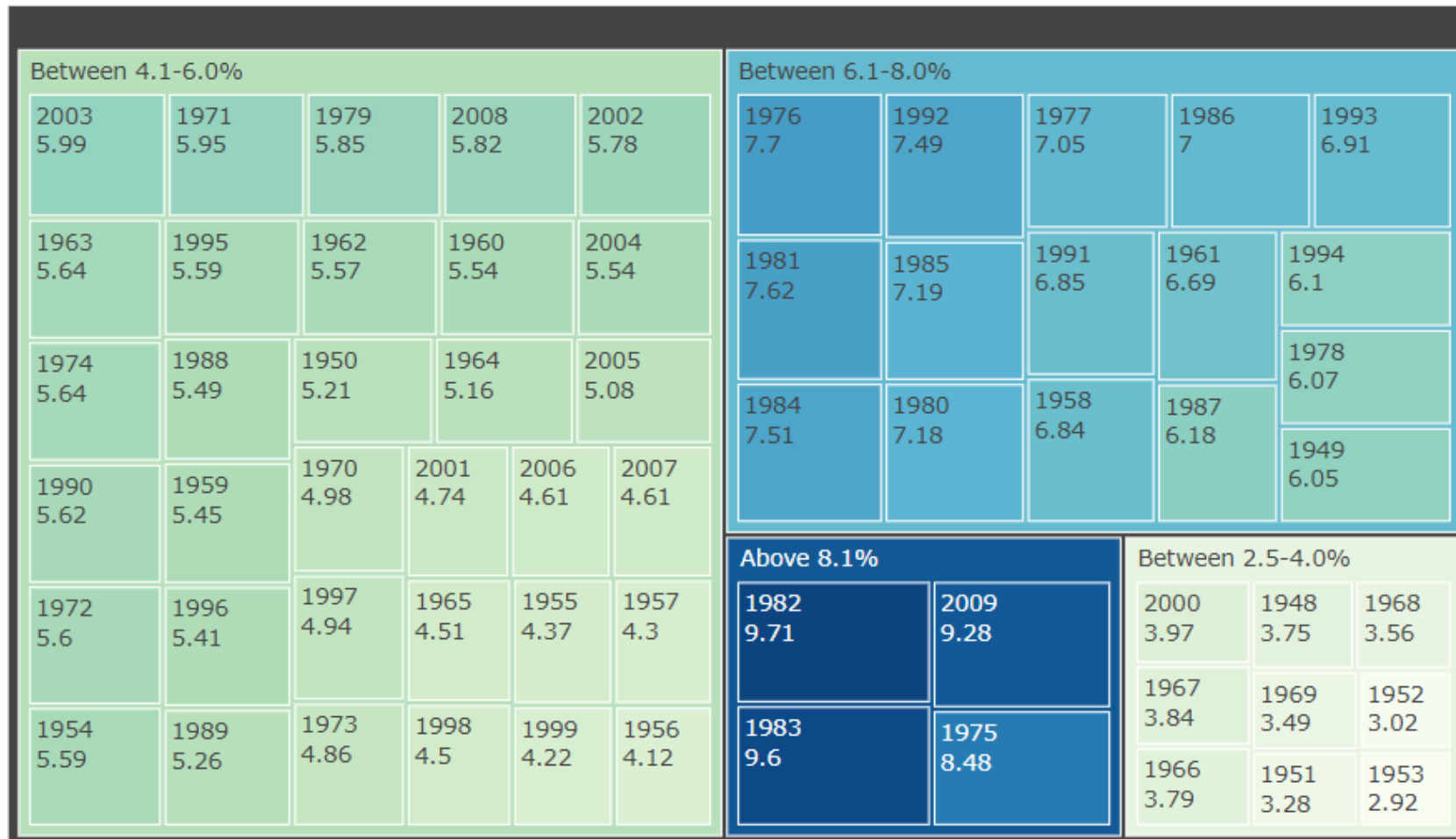


# Python – Stacked Area Chart

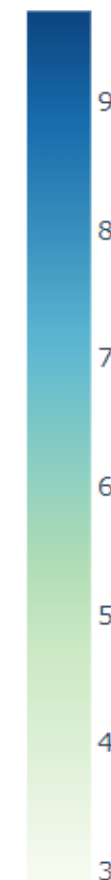


# Python – Tree Map

## Python - Tree Map: Average Unemployment Rate Distribution from 1948-2009

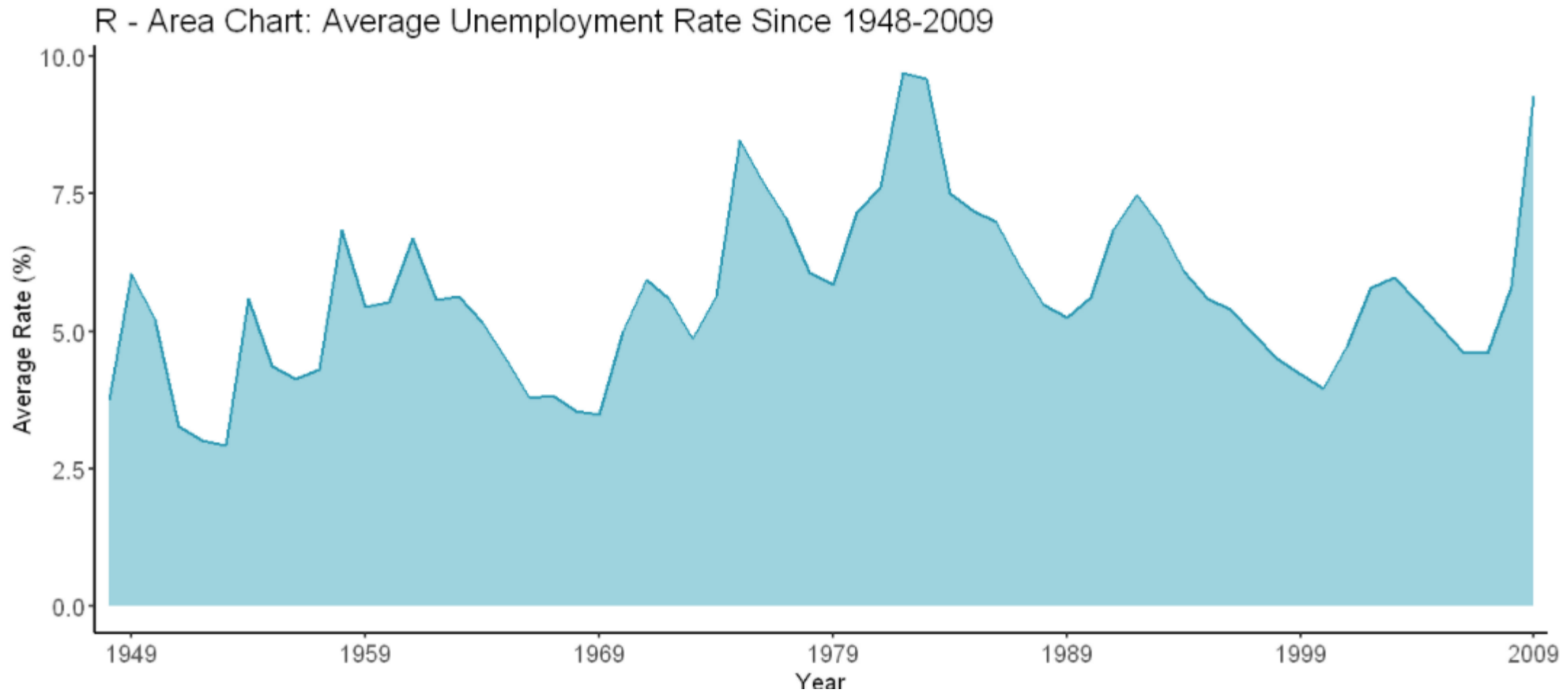


YearlyAverage



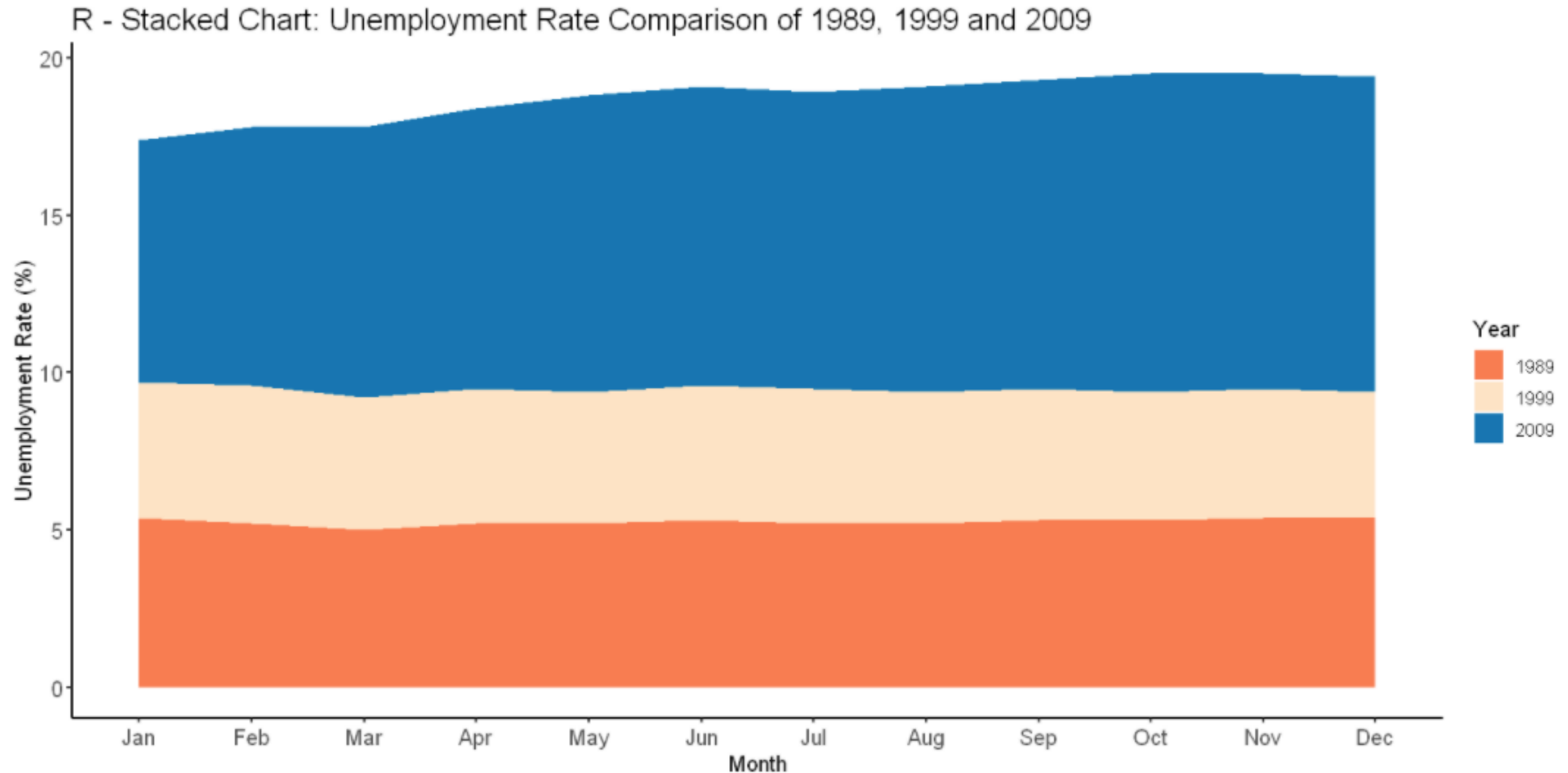
Note: Average Unemployment Rate is binned into categories to plot Tree Maps

# R – Area Chart



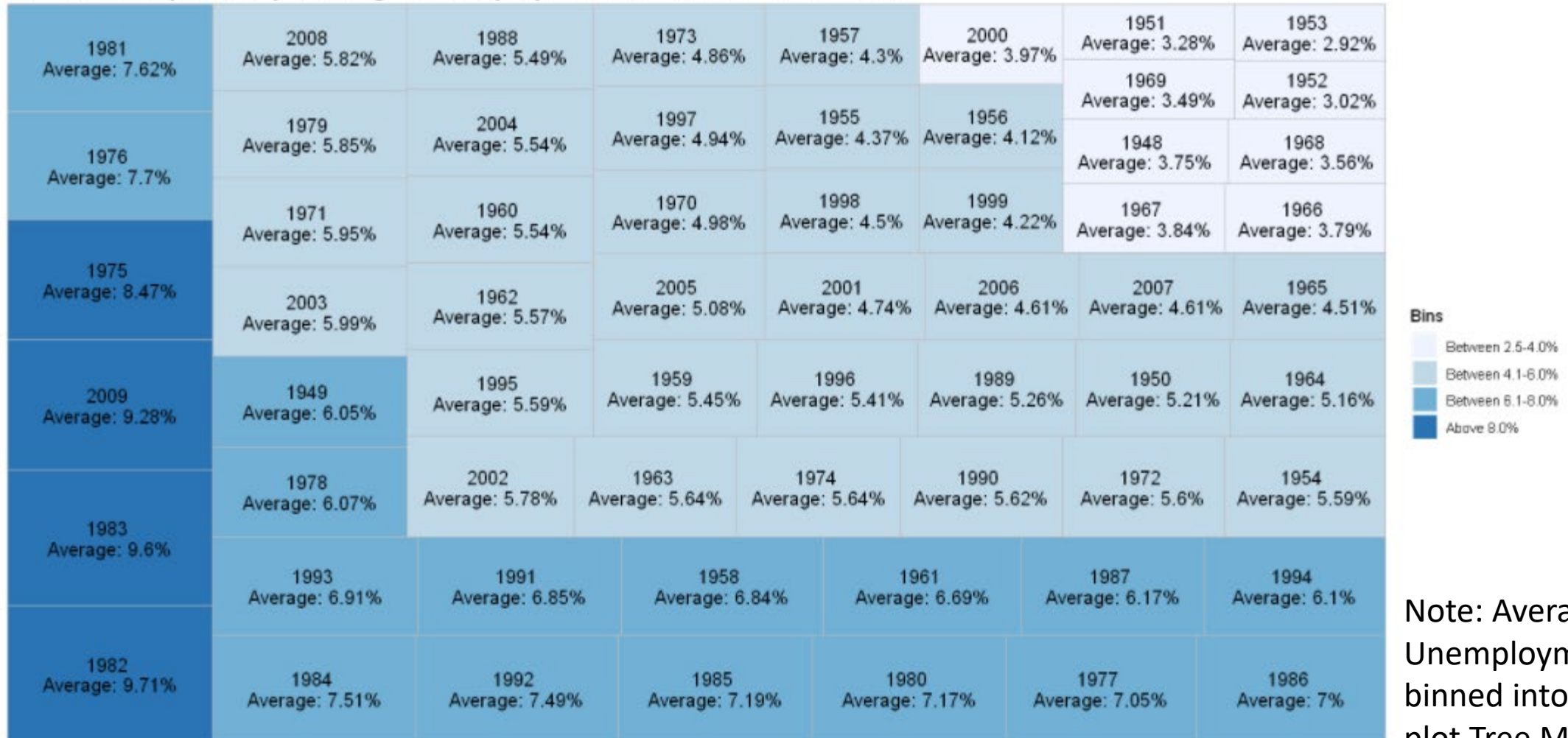


# R – Stacked Area Chart



# R – Tree Map

R - Tree Map: Yearly Average Unemployment Rate from 1948-2009



Note: Average Unemployment Rate is binned into categories to plot Tree Maps

# Supplemental Files

- Python Code
- R Code
- PowerBI Screenshot

# Python Script

## Assignment 3.2: Tree Maps, Area Chart and Stacked Area Chart

DSC640

Taniya Adhikari

```
In [1]: import pandas as pd
import numpy as np
import seaborn as sns
import matplotlib.pyplot as plt
%matplotlib inline
from numerize import numerize
import matplotlib.ticker as ticker
from matplotlib.ticker import FuncFormatter
import plotly.express as px
```

```
In [2]: df = pd.read_csv('unemployment-rate-1948-2010.csv')
```

```
In [3]: df['Period'].replace({"M01": "Jan", "M02": "Feb", "M03": "Mar", "M04": "Apr", "M05": "May", "M06": "Jun",
                             "M07": "Jul", "M08": "Aug", "M09": "Sep", "M10": "Oct", "M11": "Nov", "M12": "Dec"}, inplace=True)
```

```
In [4]: df.describe()
```

Out[4]:

	Year	Value
count	746.000000	746.000000
mean	1978.584450	5.666488
std	17.957638	1.567909
min	1948.000000	2.500000
25%	1963.000000	4.525000
50%	1979.000000	5.500000
75%	1994.000000	6.600000
max	2010.000000	10.800000

In [5]:

```
df[df['Year'] ==2010]
```

Out[5]:

	Series id	Year	Period	Value
744	LNS14000000	2010	Jan	9.7
745	LNS14000000	2010	Feb	9.7

In [6]:

```
df.drop([744, 745], inplace=True)
```

In [7]:

```
avg = df.groupby('Year').mean()
avg.reset_index(level=0, inplace=True)
avg = avg.round({'Value': 2})
```

In [8]:

```
plt.rcParams['figure.figsize'] = [20,10]
fig, ax = plt.subplots()

plt.fill_between(avg['Year'], avg['Value'], color="skyblue", alpha=0.4)
plt.plot(avg['Year'], avg['Value'], color="Slateblue", alpha=0.6, linewidth=2)

plt.tick_params(labelsize=16)
plt.xticks([1949, 1959, 1969, 1979, 1989, 1999, 2009])
plt.suptitle("Python - Area Chart: Average Unemployment Rate Since 1948-2009",
```

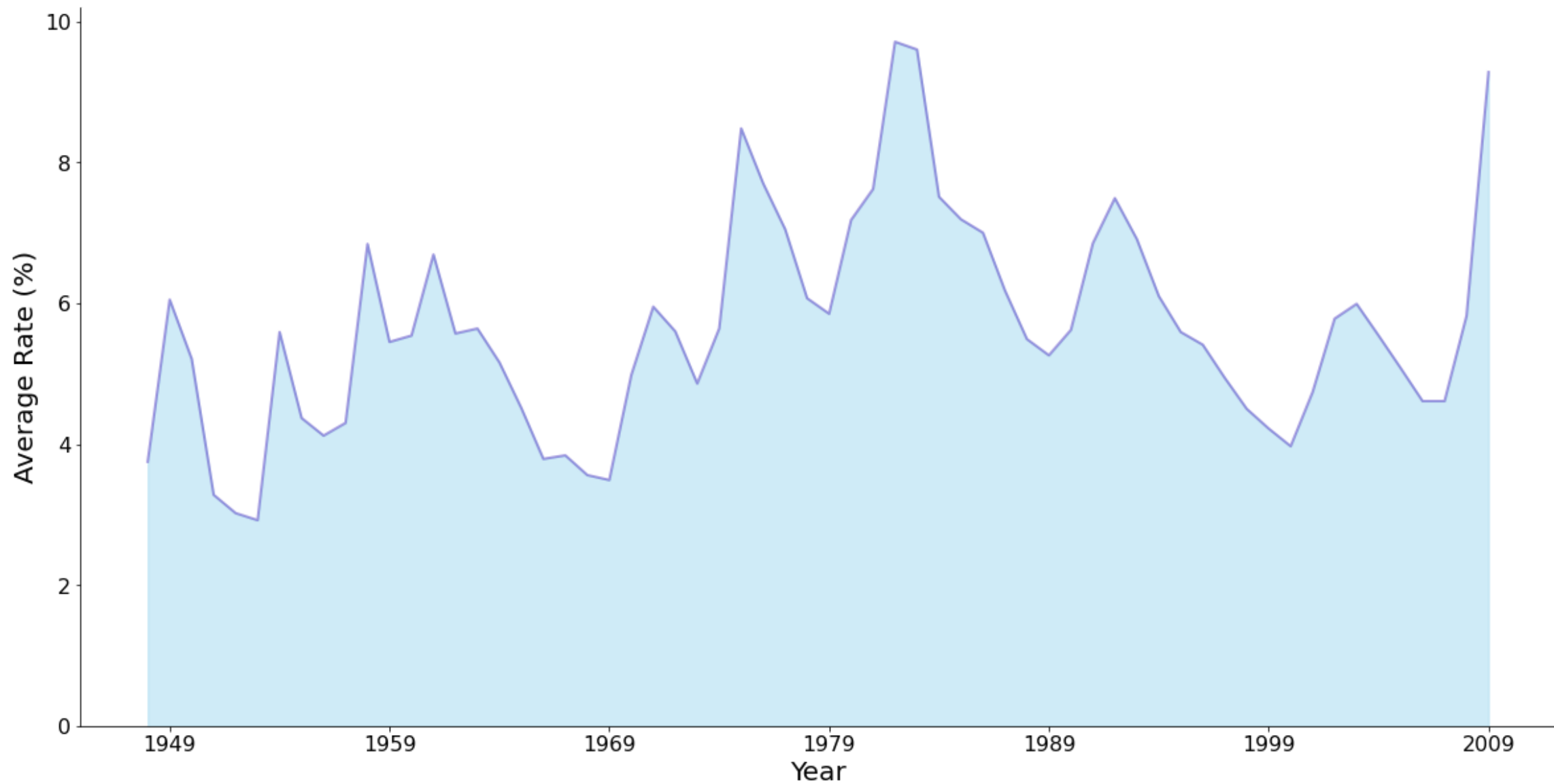
```
        size=20, x=.125, y=.95, horizontalalignment='left', verticalalignment='top')

plt.xlabel('Year', size=20)
plt.ylabel('Average Rate (%)', size=20)
plt.ylim(bottom=0)

right_side = ax.spines["right"]
right_side.set_visible(False)
top = ax.spines["top"]
top.set_visible(False)

plt.show()
```

# Python - Area Chart: Average Unemployment Rate Since 1948-2009



```
In [9]: y_1999 = df[df['Year']==1999]
y_2009 = df[df['Year']==2009]
y_1989 = df[df['Year']==1989]
```

```
In [25]: plt.rcParams['figure.figsize'] = [20,10]
fig, ax = plt.subplots()

plt.stackplot(y_1989['Period'], y_1989['Value'], y_1999['Value'], y_2009['Value'], labels=['1989', '1999', '2009'],
              colors = ['#D87860', '#f0c0a8', '#304878'])

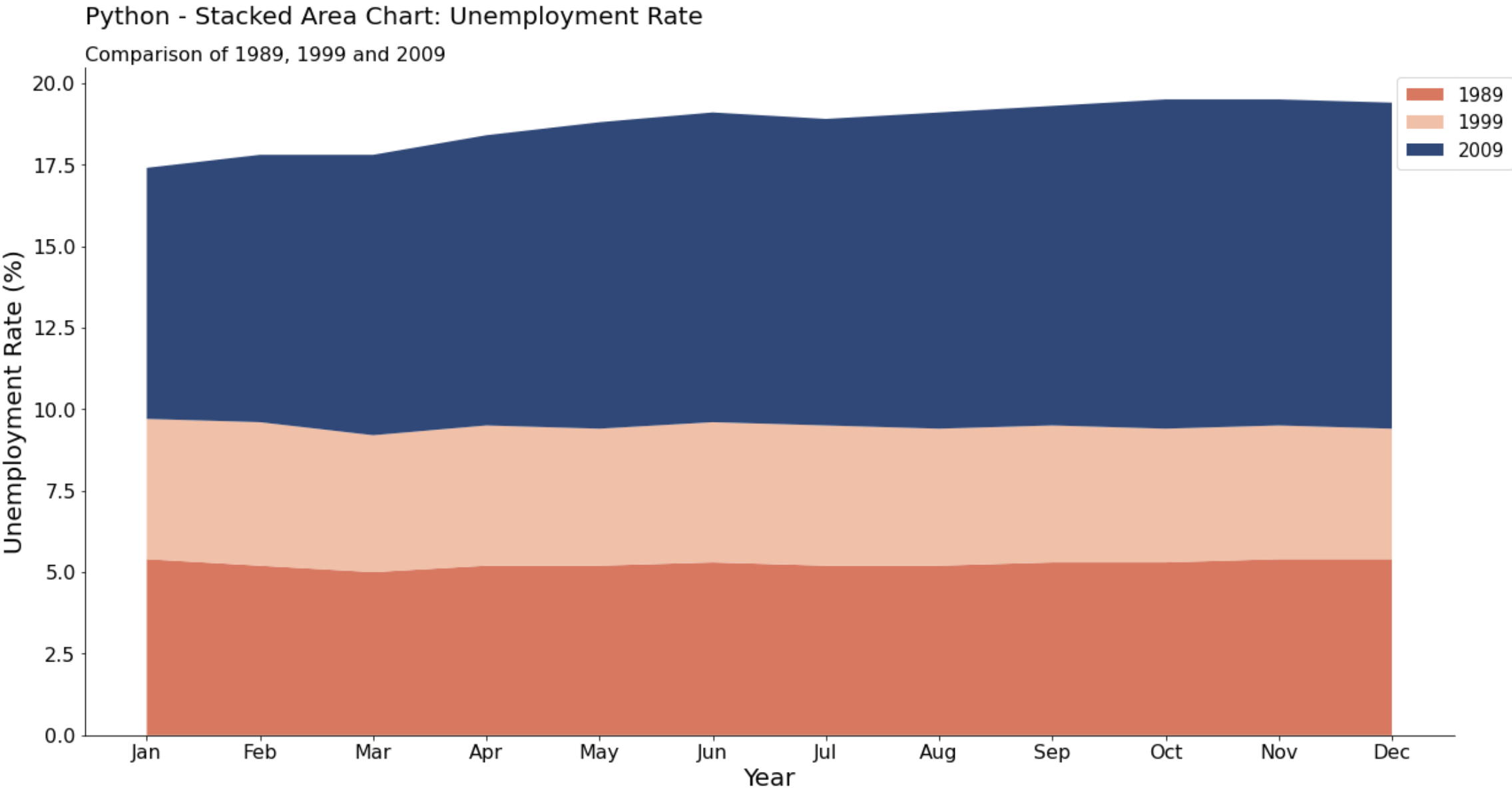
plt.tick_params(labelsize=16)
plt.suptitle("Python - Stacked Area Chart: Unemployment Rate",
             size=20, x=.125, y=.95, horizontalalignment='left', verticalalignment='top')

plt.title("Comparison of 1989, 1999 and 2009", size=16, loc='left')
plt.xlabel('Year', size=20)
plt.ylabel('Unemployment Rate (%)', size=20)
plt.ylim(bottom=0)

right_side = ax.spines["right"]
right_side.set_visible(False)
top = ax.spines["top"]
top.set_visible(False)
plt.legend(bbox_to_anchor=(1.05, 1), loc='upper right', borderpad=0.5, fontsize=15)

plt.show()
```





```
In [11]: #binning method for confidence of fire.
bins = [2.5,4.0,6.0,8.0,11]
labels = ['Between 2.5-4.0%', 'Between 4.1-6.0%', 'Between 6.1-8.0%', 'Above 8.1%']
avg['Threshold'] = pd.cut(avg['Value'], bins=bins, labels=labels)
avg['Threshold'].fillna('Between 2.5-4.0%', inplace=True)
```

```
In [12]: avg.rename(columns={"Value": "YearlyAverage"}, inplace=True)
```

```
In [13]: fig = px.treemap(avg,
                        path=['Threshold', 'Year'],
                        values='YearlyAverage',
                        color='YearlyAverage',
                        color_continuous_scale='GnBu')

fig.update_layout(
    uniformtext=dict(minsize=10, mode='show'),
    margin = dict(t=50, l=25, r=25, b=25),
    title_text = 'Python - Tree Map: Average Unemployment Rate Distribution from 1948-2009',
    title_font_family="Arial",
    title_font_size = 22,
    title_font_color="black",
    title_x=0.03,
)
fig.data[0].textinfo = 'label+text+value'
fig.layout.hovermode = False
fig.show()
```

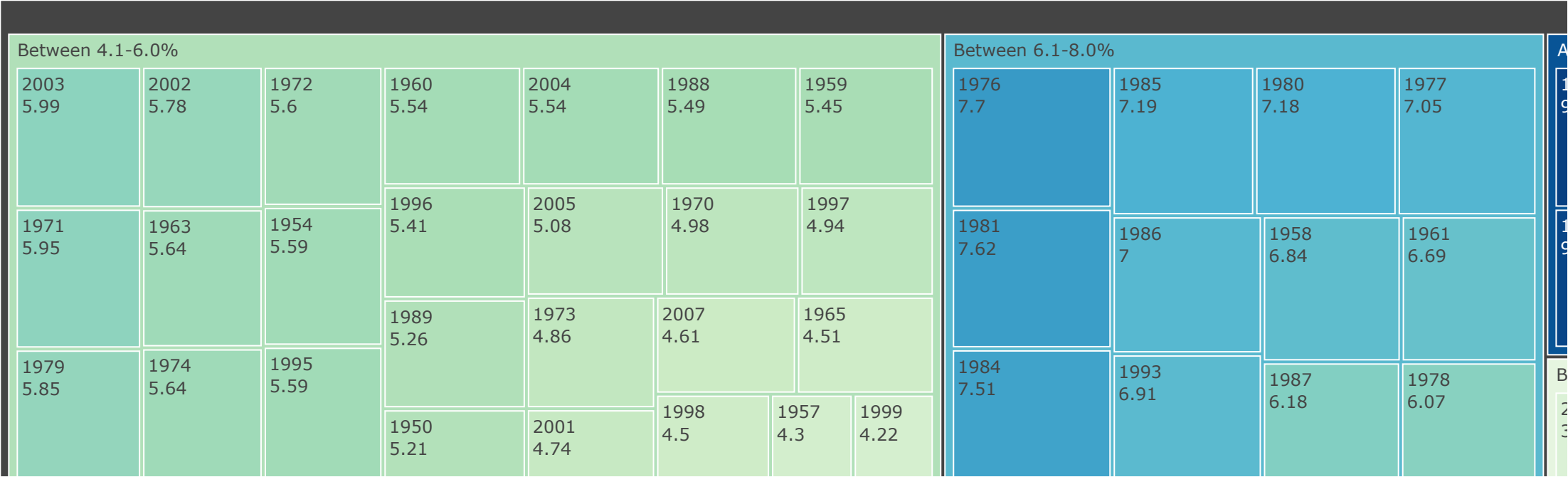
C:\Users\bibek\anaconda3\envs\my\_env\lib\site-packages\plotly\express\\_core.py:1637: FutureWarning: The frame.append method is deprecated and will be removed from pandas in a future version. Use pandas.concat instead.

```
df_all_trees = df_all_trees.append(df_tree, ignore_index=True)
```

C:\Users\bibek\anaconda3\envs\my\_env\lib\site-packages\plotly\express\\_core.py:1637: FutureWarning: The frame.append method is deprecated and will be removed from pandas in a future version. Use pandas.concat instead.

```
df_all_trees = df_all_trees.append(df_tree, ignore_index=True)
```

# Python - Tree Map: Average Unemployment Rate Distribution from 1948-2009



# R Script

## Assignment 3.2: Tree Maps, Area Chart and Stacked Area Chart

DSC640

Taniya Adhikari

In [36]:

```
library(ggplot2)
library(readxl)
library(scales)
library(plyr)
library(dplyr)
```

In [3]:

```
df <- read.csv("unemployment-rate-1948-2010.csv")
head(df)
```

Series.id	Year	Period	Value
LNS14000000	1948	M01	3.4
LNS14000000	1948	M02	3.8
LNS14000000	1948	M03	4.0
LNS14000000	1948	M04	3.9
LNS14000000	1948	M05	3.5
LNS14000000	1948	M06	3.6

In [7]:

```
df<-df[!(df$Year==2010),]
```

In [17]:

```
avg = ddply(df, .(Year), summarize, Average=mean(Value))
head(avg)
```

Year	Average
1948	3.750000
1949	6.050000
1950	5.208333
1951	3.283333
1952	3.025000
1953	2.925000

In [249...

```
options(repr.plot.width =11, repr.plot.height =5)
ggplot(avg, aes(x=Year, y=Average)) +
  geom_area( fill='#008FAD', alpha=0.4) +
  geom_line(size = .6, color='#008FAD') +
  theme_classic() +
  theme(text = element_text(family="sans",size =12, color="black"), element_line(size = .6),
        plot.title = element_text(size = 16), axis.text.x = element_text(size=12),
        axis.text.y = element_text(size=12)) +
  expand_limits(y = c(0, NA)) +
  scale_x_discrete(name = "Year", limits=c(1949,1959,1969, 1979,1989, 1999, 2009)) +
  ylab("Average Rate (%)") +
  ggtitle("R - Area Chart: Average Unemployment Rate Since 1948-2009")
```



```
In [195... mygroups<-df[(df$Year==1989 | df$Year==1999 | df$Year==2009),]  
mygroups$Period <- as.character(mygroups$Period)
```

```
In [196... mygroups[mygroups == "M01"] <- 1  
mygroups[mygroups == "M02"] <- 2  
mygroups[mygroups == "M03"] <- 3  
mygroups[mygroups == "M04"] <- 4  
mygroups[mygroups == "M05"] <- 5  
mygroups[mygroups == "M06"] <- 6  
mygroups[mygroups == "M07"] <- 7
```

```
mygroups[mygroups == "M08"] <- 8
mygroups[mygroups == "M09"] <- 9
mygroups[mygroups == "M10"] <- 10
mygroups[mygroups == "M11"] <- 11
mygroups[mygroups == "M12"] <- 12
```

In [197...

```
mygroups$Period = as.factor(mygroups$Period)
```

In [198...

```
mygroups$Year <- as.factor(mygroups$Year)
```

In [199...

```
head(mygroups)
```

	Series.id	Year	Period	Value
493	LNS14000000	1989	1	5.4
494	LNS14000000	1989	2	5.2
495	LNS14000000	1989	3	5.0
496	LNS14000000	1989	4	5.2
497	LNS14000000	1989	5	5.2
498	LNS14000000	1989	6	5.3

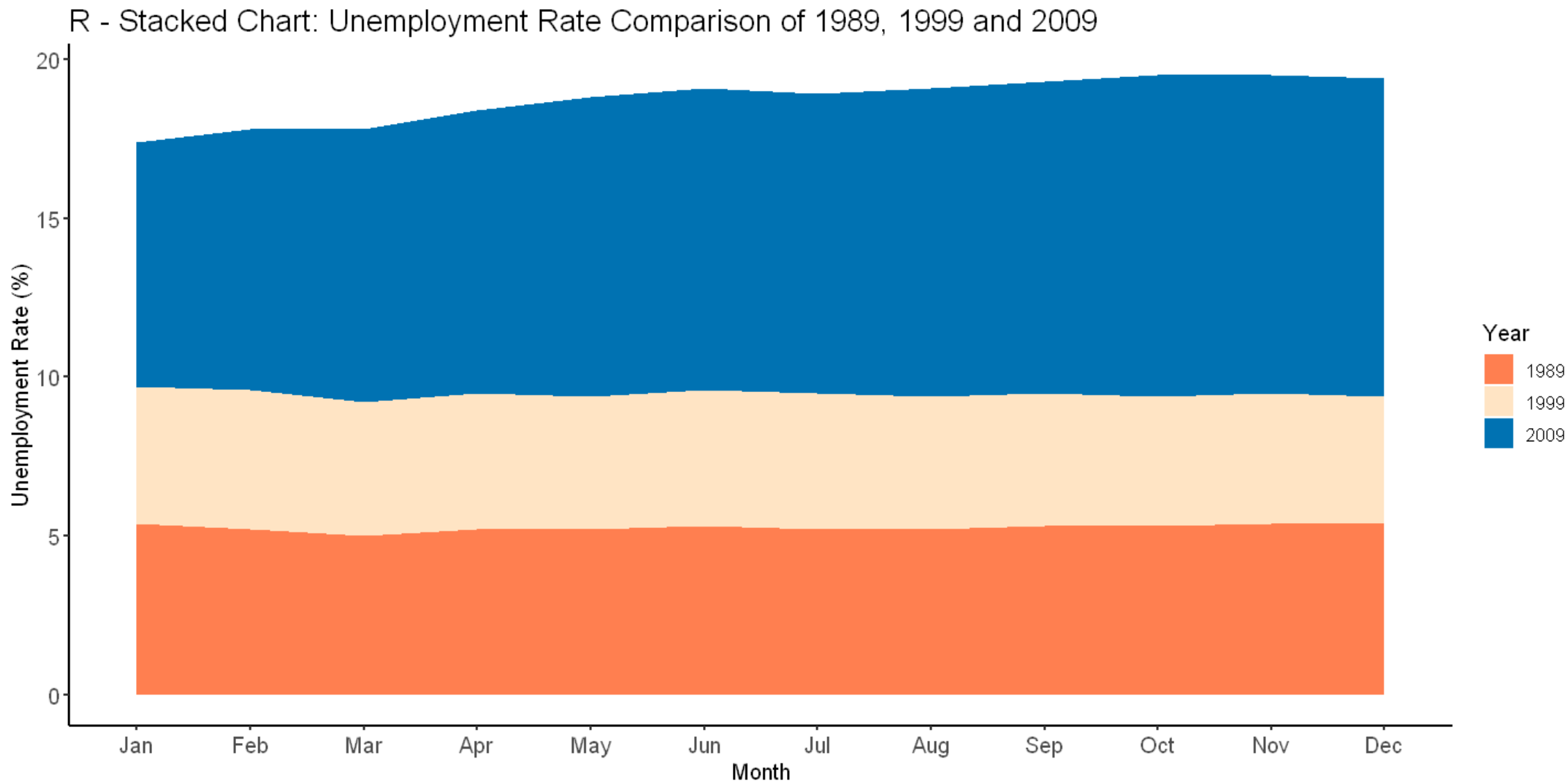
In [200...

```
# Give a specific order:
mygroups$Year <- factor(mygroups$Year, levels=c("2009", "1999", "1989"))
```

In [248...

```
options(repr.plot.width =12, repr.plot.height =6)
level_order <- c('1', '2', '3', '4', '5', '6', '7', '8', '9', '10', '11', '12')
ggplot(mygroups, aes(x=factor(Period,level=level_order), y=Value)) +
  geom_area(aes(group=Year, fill =Year)) +
  scale_fill_manual(values = c("#0072B2","bisque","coral")) +
  guides(fill = guide_legend(reverse=TRUE)) +
  theme_classic() +
  theme(text = element_text(family="sans",size =12, color="black"), element_line(size = .6),
        plot.title = element_text(size = 16), axis.text.x = element_text(size=12),
        axis.text.y = element_text(size=12)) +
  expand_limits(y = c(0, NA)) +
```

```
scale_x_discrete(labels=c("1" = "Jan", "2" = "Feb", "3" = "Mar", "4" = "Apr", "5" = "May", "6" = "Jun",  
                          "7" = "Jul", "8" = "Aug", "9" = "Sep", "10" = "Oct", "11" = "Nov", "12" = "Dec")) +  
ylab("Unemployment Rate (%)") + xlab("Month") +  
ggtitle("R - Stacked Chart: Unemployment Rate Comparison of 1989, 1999 and 2009")
```



```
In [212... avg$Bins <- ""
```



```
In [218... avg[avg$Average < 4.0, "Bins"] <- "Between 2.5-4.0%"
avg[avg$Average > 4.0 & avg$Average < 6.0, "Bins"] <- "Between 4.1-6.0%"
avg[avg$Average > 6.0 & avg$Average < 8.0, "Bins"] <- "Between 6.1-8.0%"
avg[avg$Average > 8.0, "Bins"] <- "Above 8.0%"
```

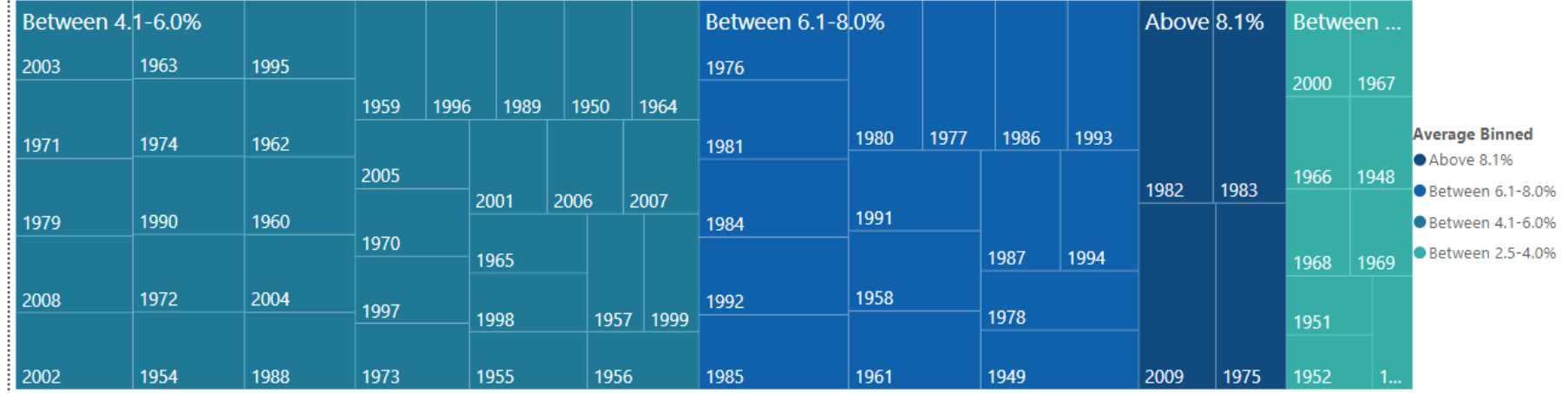
```
In [232... # Give a specific order:
avg$Bins <- factor(avg$Bins, levels=c("Between 2.5-4.0%", "Between 4.1-6.0%", "Between 6.1-8.0%", "Above 8.0%"))
```

```
In [229... library(treemapify)
```

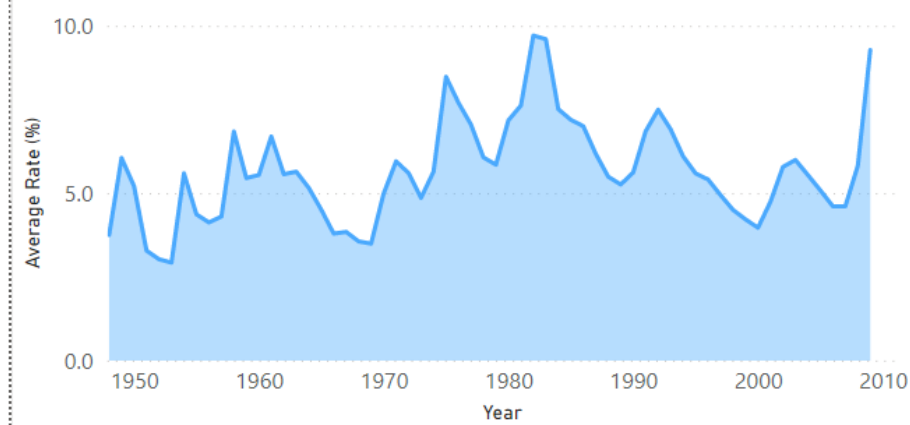
```
In [254... options(repr.plot.width =14, repr.plot.height =7)
ggplot(avg, aes(area =Average, fill =Bins,
                label =paste0(Year, " ", "\n", "Average: ",round(Average, digits = 2), "%"), subgroup=Year)) +
  geom_treemap() +
  theme(plot.title = element_text(size = 20))+
  geom_treemap_text(colour = "black",
                    place = "centre",
                    size = 12) +
  scale_fill_brewer(palette = "Blues") +
  ggtitle("R - Tree Map: Yearly Average Unemployment Rate from 1948-2009")
```

1981 Average: 7.62%	2008 Average: 5.82%	1988 Average: 5.49%	1973 Average: 4.86%	1957 Average: 4.3%	2000 Average: 3.97%	1951 Average: 3.28%		1953 Average: 2.92%	
						1969 Average: 3.49%		1952 Average: 3.02%	
1976 Average: 7.7%	1979 Average: 5.85%	2004 Average: 5.54%	1997 Average: 4.94%	1955 Average: 4.37%	1956 Average: 4.12%	1948 Average: 3.75%		1968 Average: 3.56%	
						1967 Average: 3.84%		1966 Average: 3.79%	
1975 Average: 8.47%	2003 Average: 5.99%	1960 Average: 5.54%	1970 Average: 4.98%	1998 Average: 4.5%	1999 Average: 4.22%	2006 Average: 4.61%		2007 Average: 4.61%	
						2005 Average: 5.08%		2001 Average: 4.74%	
2009 Average: 9.28%	1949 Average: 6.05%	1995 Average: 5.59%	1959 Average: 5.45%	1996 Average: 5.41%	1989 Average: 5.26%	1950 Average: 5.21%		1964 Average: 5.16%	
						2002 Average: 5.78%		1963 Average: 5.64%	
1983 Average: 9.6%	1978 Average: 6.07%	2002 Average: 5.78%	1963 Average: 5.64%	1974 Average: 5.64%	1990 Average: 5.62%	1972 Average: 5.6%		1954 Average: 5.59%	
						1993 Average: 6.91%		1991 Average: 6.85%	
1982 Average: 9.71%	1984 Average: 7.51%	1992 Average: 7.49%	1985 Average: 7.19%	1980 Average: 7.17%	1977 Average: 7.05%	1987 Average: 6.17%		1994 Average: 6.1%	
						1993 Average: 6.91%		1991 Average: 6.85%	

# PowerBI - Tree Map: Average Unemployment Rate Distribution from 1948-2009



## PowerBI - Area Chart: Average Employment Rate since 1948-2009



## PowerBI - Stacked Area Chart: Unemployment Rate Compari...

