# Assignment_3_2_R & Python_code_Raghuwanshi_Prashant_DSC640

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### 3.2 Exercises: Tree Maps, Area Charts, and Stacked Area Charts

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### Course: DSC640-T301 Data Presentation & Visualization (2223-1)

[1]:

```
##### Import common Data preparation libraries:
import numpy as np
import matplotlib.pyplot as plt
import pandas as pd
import squarify
import seaborn as sns
```

[2]:

```
##### read source file unemployement-rate-1948-2010 into dataframe
unemployement_df = pd.read_csv('unemployement-rate-1948-2010.csv')
##### display firt 5 records
unemployement_df.head(5)
```

[2]:

```
     Series id  Year Period  Value
0  LNS14000000  1948    M01    3.4
1  LNS14000000  1948    M02    3.8
2  LNS14000000  1948    M03    4.0
3  LNS14000000  1948    M04    3.9
4  LNS14000000  1948    M05    3.5
```

[3]:

```
##### read source file unemployement-rate-1948-2010 into dataframe
expenditures_df = pd.read_csv('expenditures.txt', '\t')
##### display firt 5 records
expenditures_df.head(5)
```

[3]:

```
   year             category  expenditure  sex
0  2008                 Food         6443    1
1  2008  Alcoholic Beverages          444    1
2  2008              Housing        17109    1
3  2008              Apparel         1801    1
```

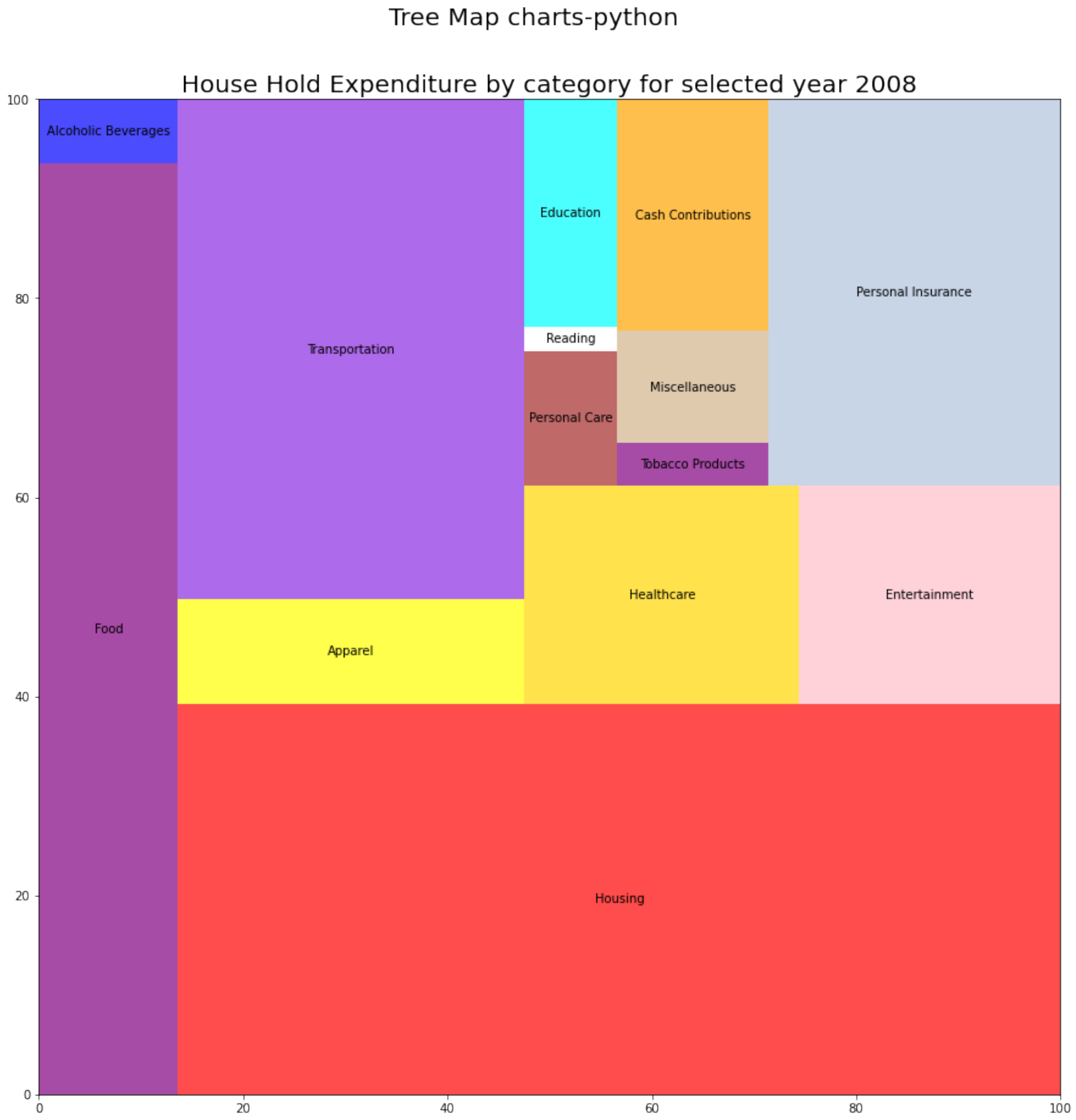
```
4  2008       Transportation         8604     1
```

[4]:

```
##### Create the garphs on top of the provided datases by using Tree Map␣
↪charts, Area stacked charts, Area charts
```

[5]:

```
##### Tree Map Graph
##### Creating year_in filter variable
year_in = 2008
plt.figure(figsize=(15,15))
color_list = {'Food':'purple', 'Alcoholic Beverages':'blue', 'Housing':'red',␣
↪'Apparel':'yellow',
              'Transportation':'blueviolet', 'Healthcare':'gold',␣
↪'Entertainment':'pink', 'Personal Care':'brown',
              'Reading':'white', 'Education':'aqua', 'Tobacco Products':
↪'purple', 'Miscellaneous':'tan', 'Cash Contributions': 'orange', 'Personal␣
↪Insurance': 'lightsteelblue'}
c = expenditures_df['category'].apply(lambda x: color_list[x])
# plot tree map
squarify.plot(sizes=expenditures_df[expenditures_df.year == year_in].
↪expenditure, label=expenditures_df[expenditures_df.year == year_in].
↪category, color = c, alpha=0.7)
subtitle_string = f'House Hold Expenditure by category for selected year␣
↪{year_in}'
title_string = 'Tree Map charts-python'
plt.suptitle(title_string, y=0.95, fontsize=20)
plt.title(subtitle_string, fontsize=20)
plt.show()
```



[6]:
```
#pivoit the dataframe to get the final data by period indexed by year
table = pd.pivot_table(data=unemployement_df,index = ['Year'], columns =␣
 ↪['Period'], values = 'Value')
table
```

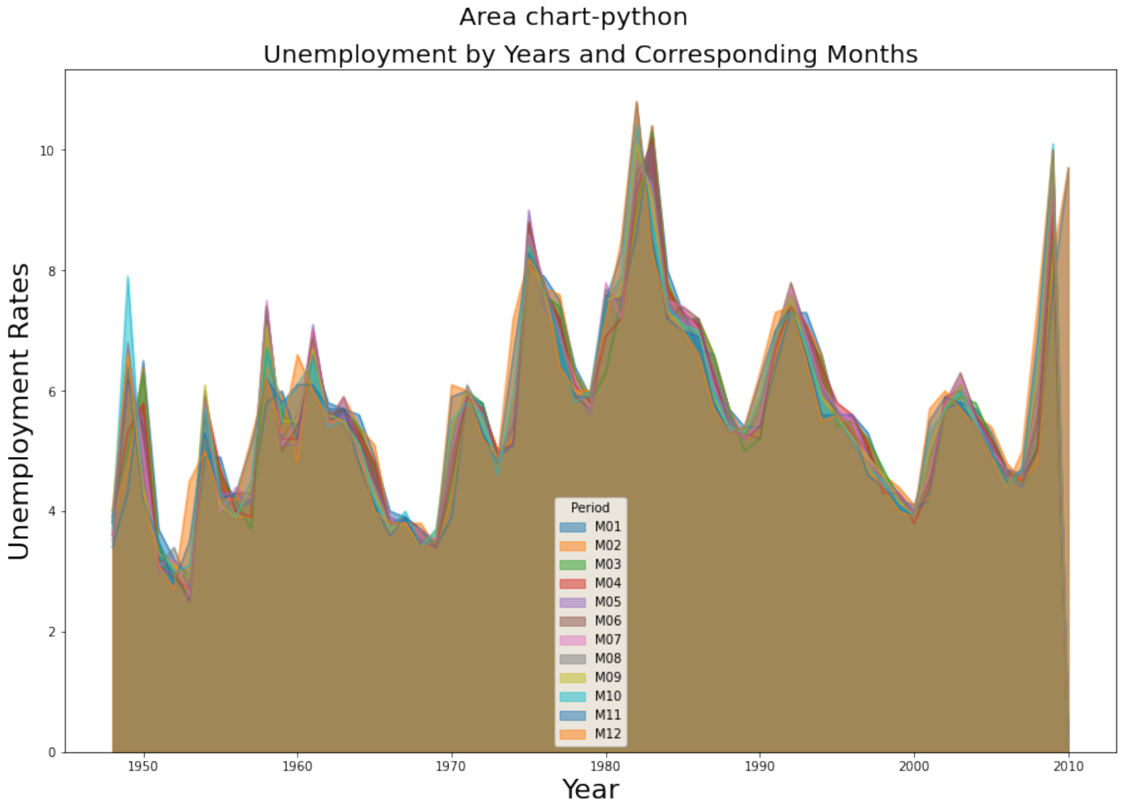
[6]:
```
Period  M01  M02  M03  M04  M05  M06  M07  M08  M09   M10   M11   M12
Year
1948    3.4  3.8  4.0  3.9  3.5  3.6  3.6  3.9  3.8   3.7   3.8   4.0
1949    4.3  4.7  5.0  5.3  6.1  6.2  6.7  6.8  6.6   7.9   6.4   6.6
1950    6.5  6.4  6.3  5.8  5.5  5.4  5.0  4.5  4.4   4.2   4.2   4.3
1951    3.7  3.4  3.4  3.1  3.0  3.2  3.1  3.1  3.3   3.5   3.5   3.1
```

```
1952    3.2  3.1  2.9  2.9  3.0  3.0  3.2  3.4  3.1   3.0   2.8   2.7
…     …  …  …  …  …  …  …  …  …   …   …   …
2006    4.7  4.8  4.7  4.7  4.6  4.6  4.7  4.7  4.5   4.4   4.5   4.4
2007    4.6  4.5  4.4  4.5  4.4  4.6  4.6  4.6  4.7   4.7   4.7   5.0
2008    5.0  4.8  5.1  5.0  5.4  5.5  5.8  6.1  6.2   6.6   6.9   7.4
2009    7.7  8.2  8.6  8.9  9.4  9.5  9.4  9.7  9.8  10.1  10.0  10.0
2010    9.7  9.7  NaN  NaN  NaN  NaN  NaN  NaN  NaN   NaN   NaN   NaN

[63 rows x 12 columns]
```

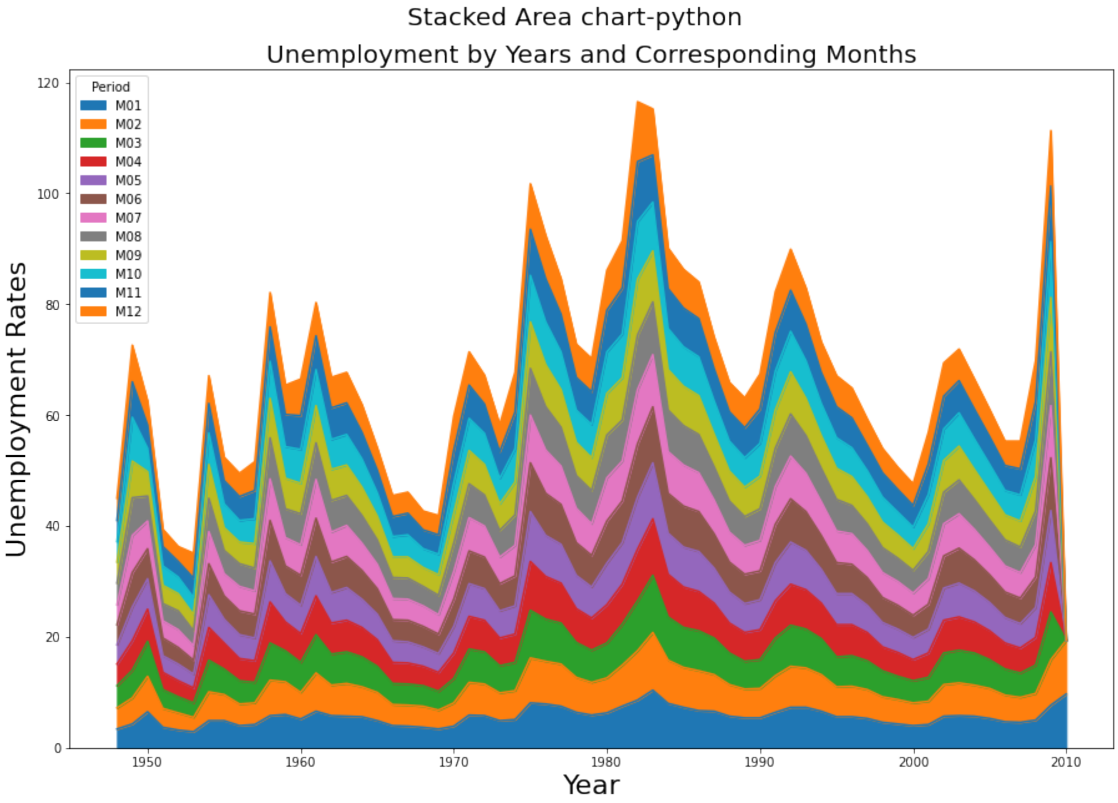
[7]:

```
##### Area Chart
table.plot(kind='area', stacked=False, figsize = (15,10))
subtitle_string = 'Unemployment by Years and Corresponding Months'
title_string = 'Area chart-python'
plt.suptitle(title_string, y=0.95, fontsize=20)
plt.title(subtitle_string, fontsize=20)
plt.ylabel("Unemployment Rates", fontsize = 22)
plt.xlabel("Year", fontsize = 22)
plt.show()
```



[8]:

```
##### SAtack Area Chart
table.plot(kind='area', stacked=True, figsize = (15,10))
subtitle_string = 'Unemployment by Years and Corresponding Months'
title_string = 'Stacked Area chart-python'
plt.suptitle(title_string, y=0.95, fontsize=20)
plt.title(subtitle_string, fontsize=20)
plt.ylabel("Unemployment Rates", fontsize = 22)
plt.xlabel("Year", fontsize = 22)
plt.show()
```



[9]:

```
expenditures_df1 = expenditures_df[expenditures_df.year == year_in]
```

[10]:

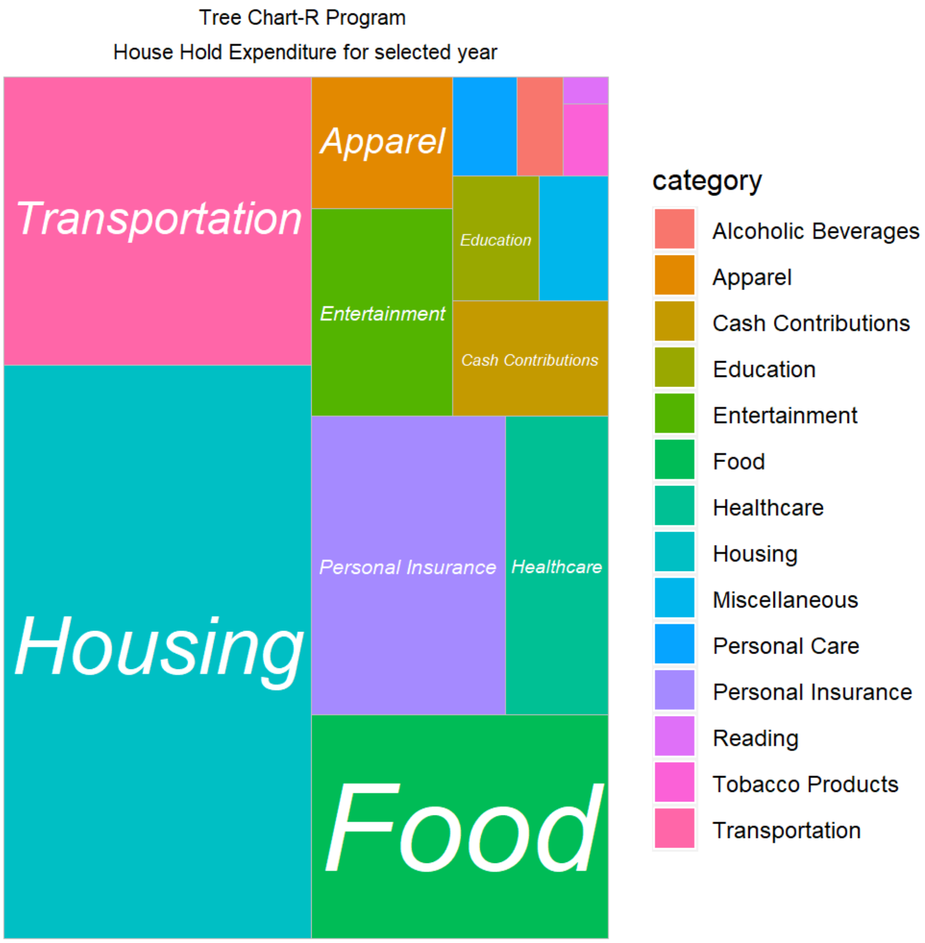
```
%load_ext rpy2.ipython
```

```
C:\Users\21313711\Anaconda3\lib\site-packages\rpy2\robjects\packages.py:366:
UserWarning: The symbol 'quartz' is not in this R namespace/package.
  warnings.warn(
```

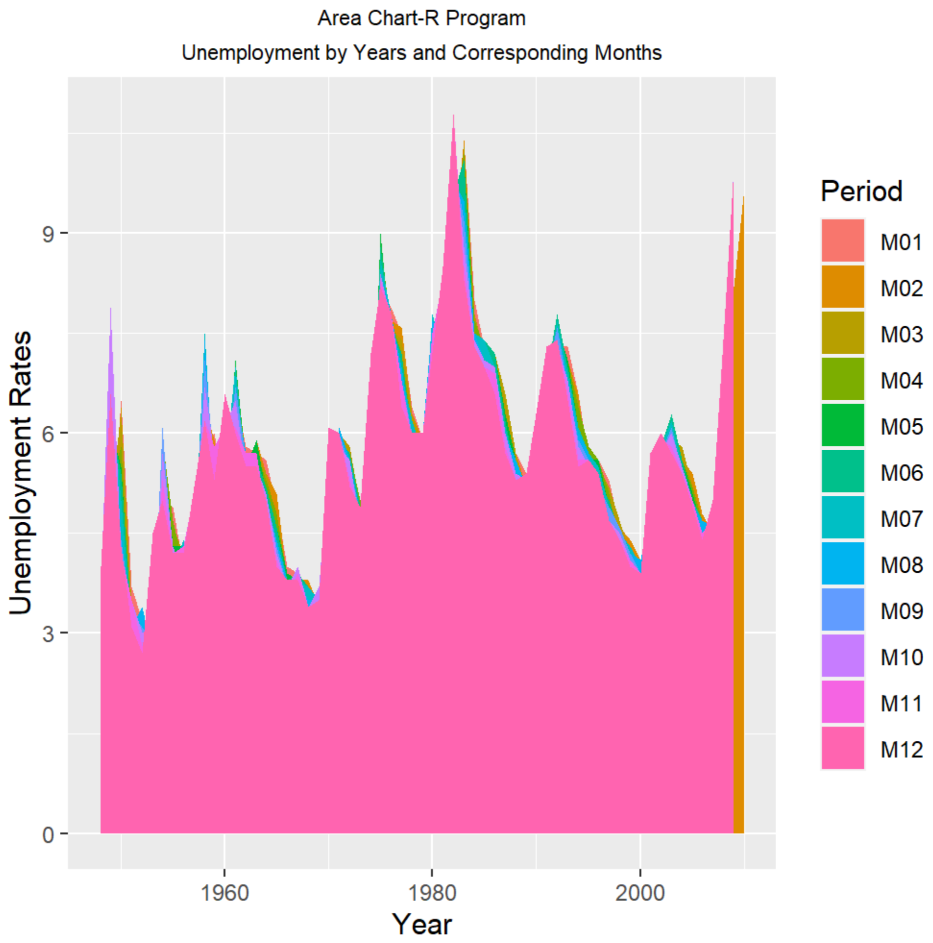
[11]:

```
%%R -i expenditures_df1 -w 5 -h 5 --units in -r 200
# import df from global environment
# make default figure size 5 by 5 inches with 200 dpi resolution
#install.packages("ggplot2", repos='http://cran.us.r-project.org', quiet=TRUE)
```

```
#install.packages("treemapify", repos='http://cran.us.r-project.org',␣
 ↪quiet=TRUE)
library(ggplot2)
library(treemapify)
ggplot(expenditures_df1, aes(area = expenditure, fill = category, label =␣
 ↪category)) +
  geom_treemap() +
  geom_treemap_text(fontface = "italic", colour = "white", place = "centre",
                    grow = TRUE) + labs(title = "Tree Chart-R Program ",
                                        subtitle = "House Hold Expenditure for␣
 ↪selected year") + theme(
                                          plot.title = element_text(hjust = 0.
 ↪5, size = 8), plot.subtitle = element_text(hjust = 0.5, size = 8))
```

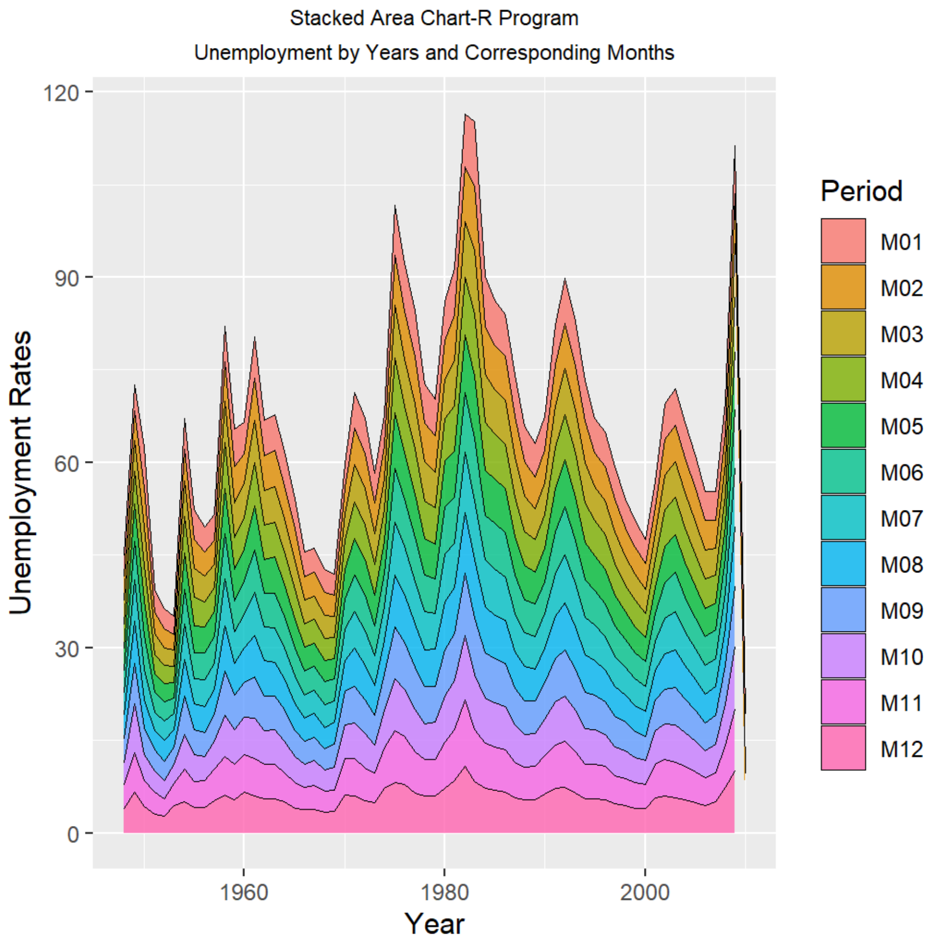


```
[12]: %%R -i unemployement_df -w 5 -h 5 --units in -r 200
      plot = ggplot(unemployement_df, aes(x=Year, y=Value, fill=Period))
plot + geom_area(position = position_dodge()) + labs(title = "Area Chart-R␣
↪Program",
                                                subtitle = "Unemployment by Years and␣
↪Corresponding Months", y = "Unemployment Rates") + theme(
                                                  plot.title = element_text(hjust = 0.
↪5, size = 8), plot.subtitle = element_text(hjust = 0.5, size = 8))
```



[13]:

```
%%R -i unemployement_df -w 5 -h 5 --units in -r 200
#ggplot(unemployement_df, aes(x=Year) + geom_area(stat = "bin") +␣
↪geom_area(aes(y =value), stat = "bin"))
plot = ggplot(unemployement_df, aes(x=Year, y=Value, fill=Period))
plot + geom_area(position = 'stack', colour="black", size=.2, alpha=.8) +␣
↪labs(title = "Stacked Area Chart-R Program",
                                                subtitle = "Unemployment by Years and␣
↪Corresponding Months", y = "Unemployment Rates") + theme(
                                                  plot.title = element_text(hjust = 0.
↪5, size = 8), plot.subtitle = element_text(hjust = 0.5, size = 8))
```


Stacked Area Chart-R Program
Unemployment by Years and Corresponding Months
Unemployment Rates
0
30
60
90
120
Year
1960
1980
2000
Period
M01
M02
M03
M04
M05
M06
M07
M08
M09
M10
M11
M12