Visualizations in Python-R-Tableau

Gillian Tatreau

October 2023

Tableau- Tree Map Chart

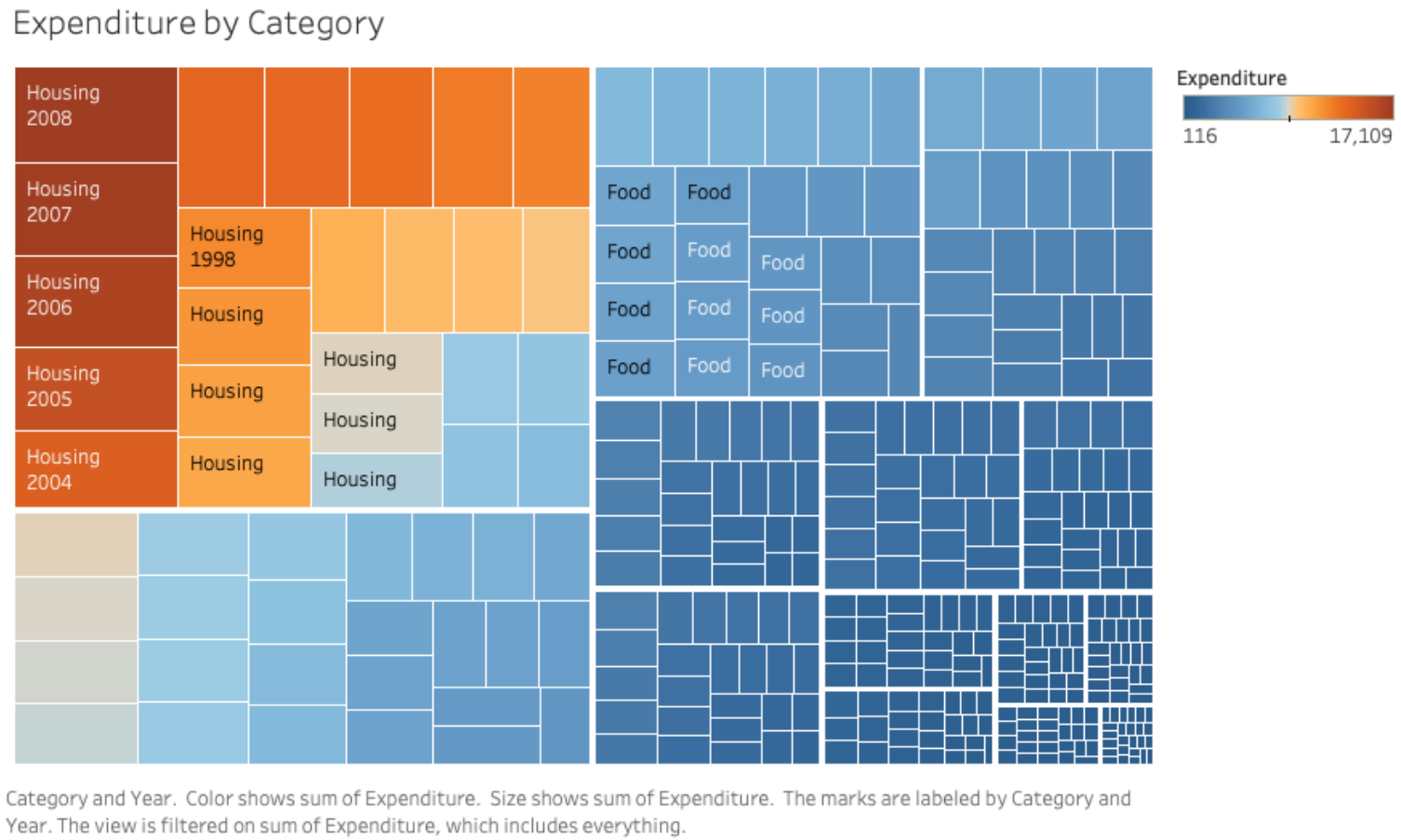


Tableau- Area Chart

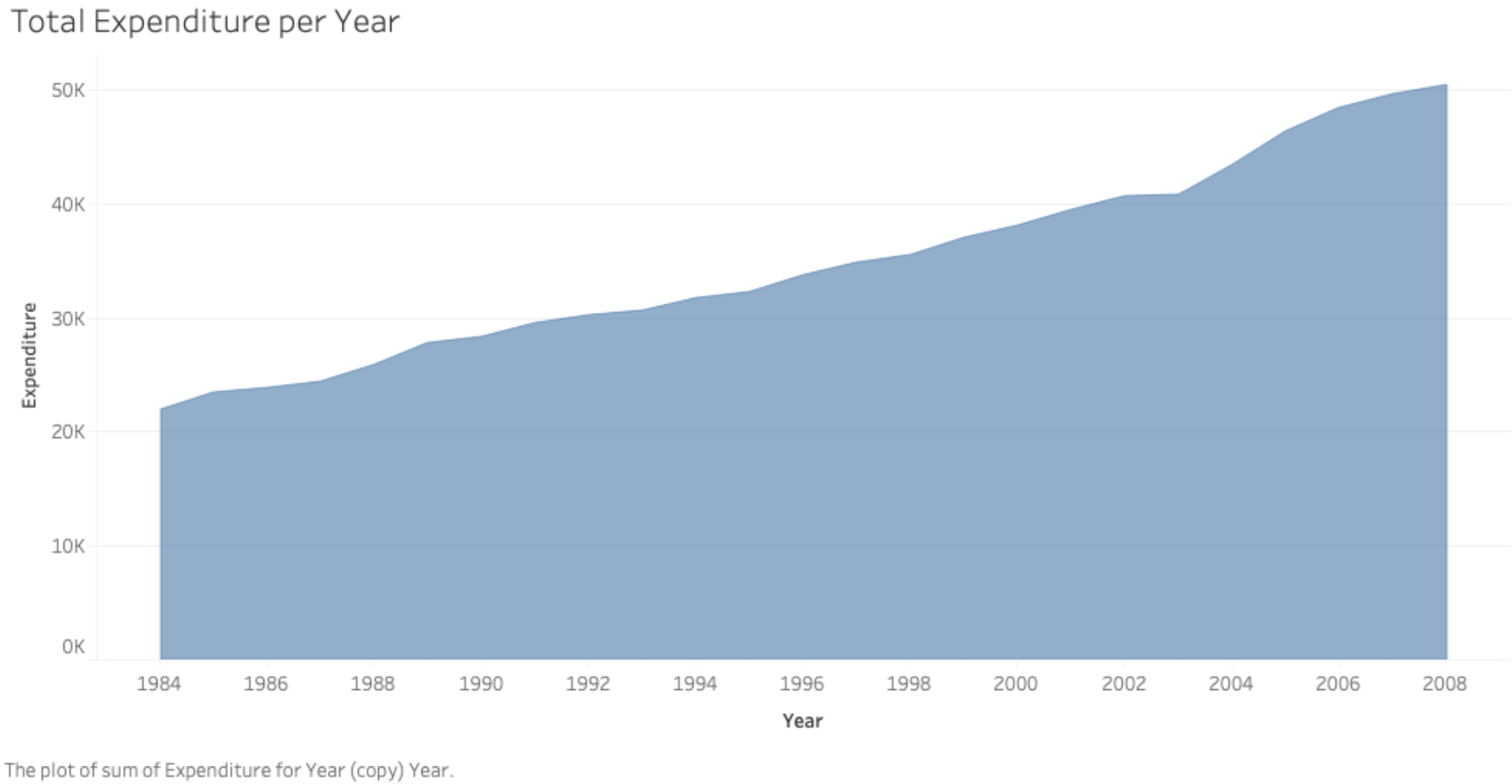
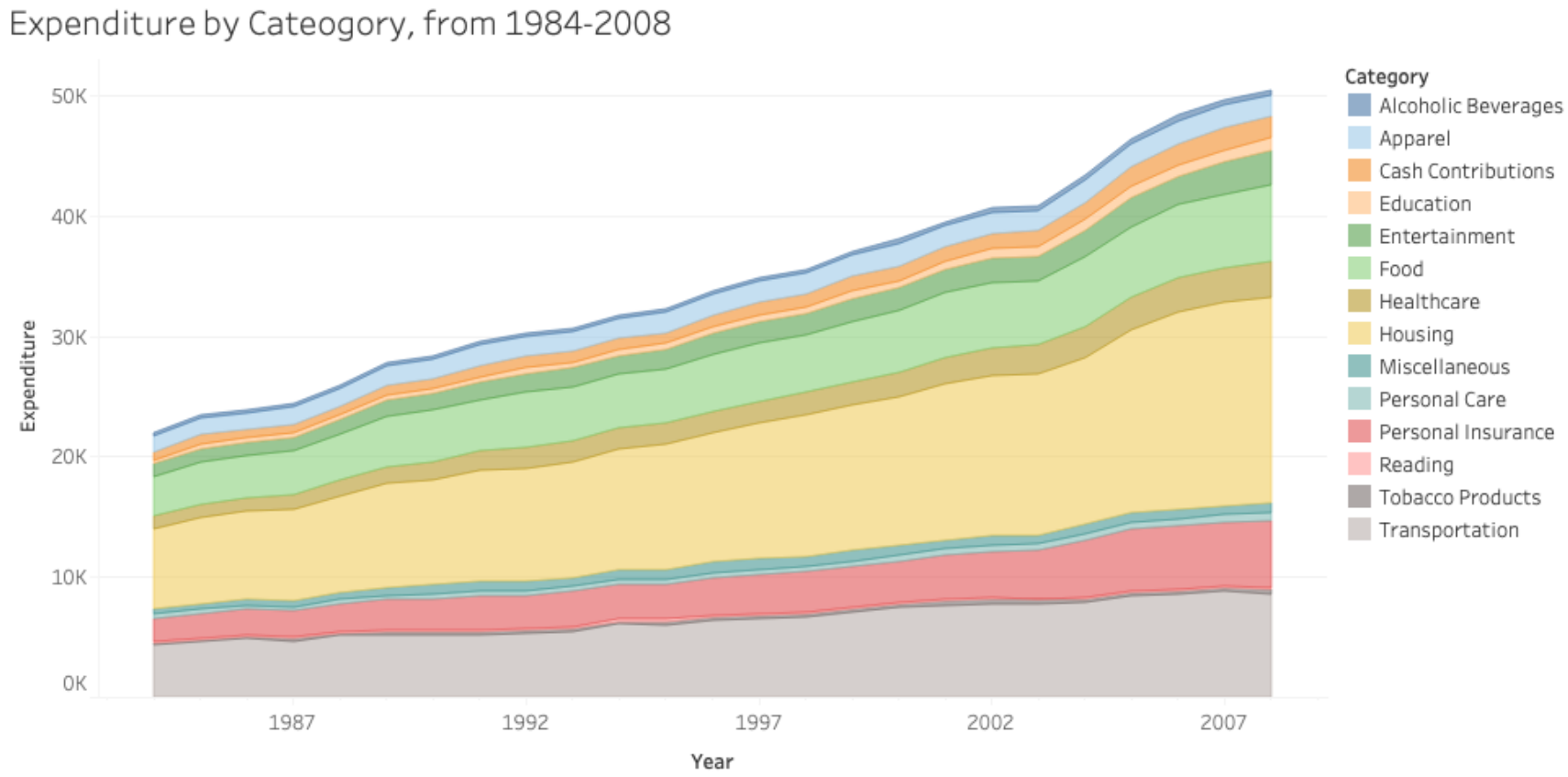
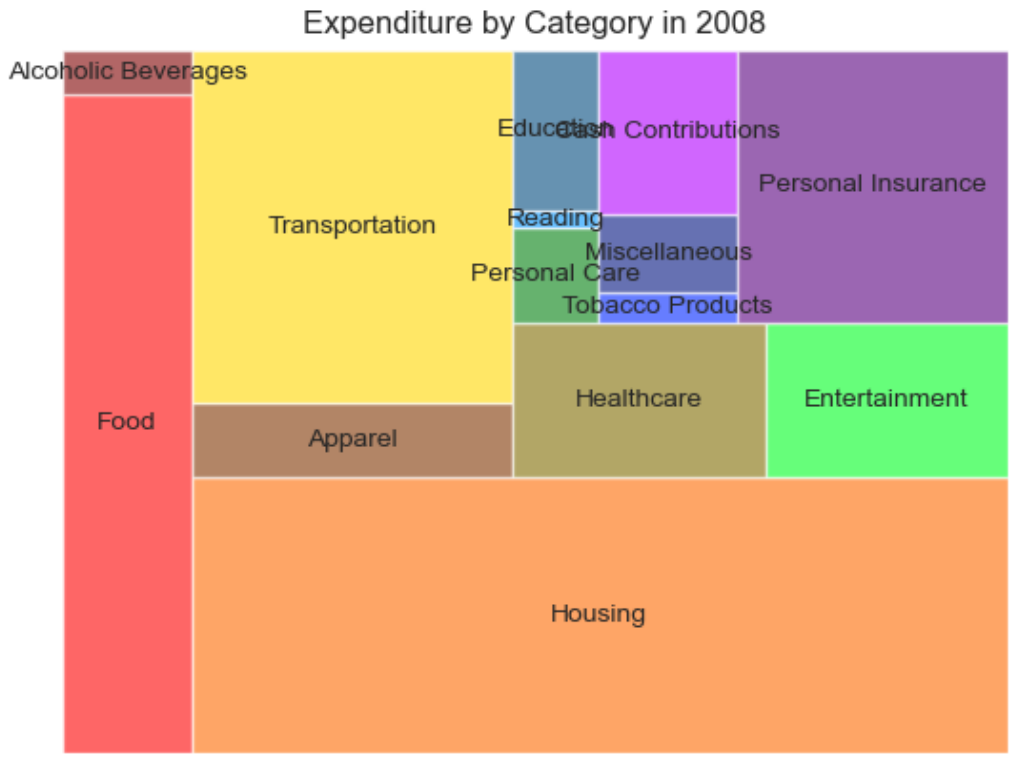


Tableau- Stacked Area Chart

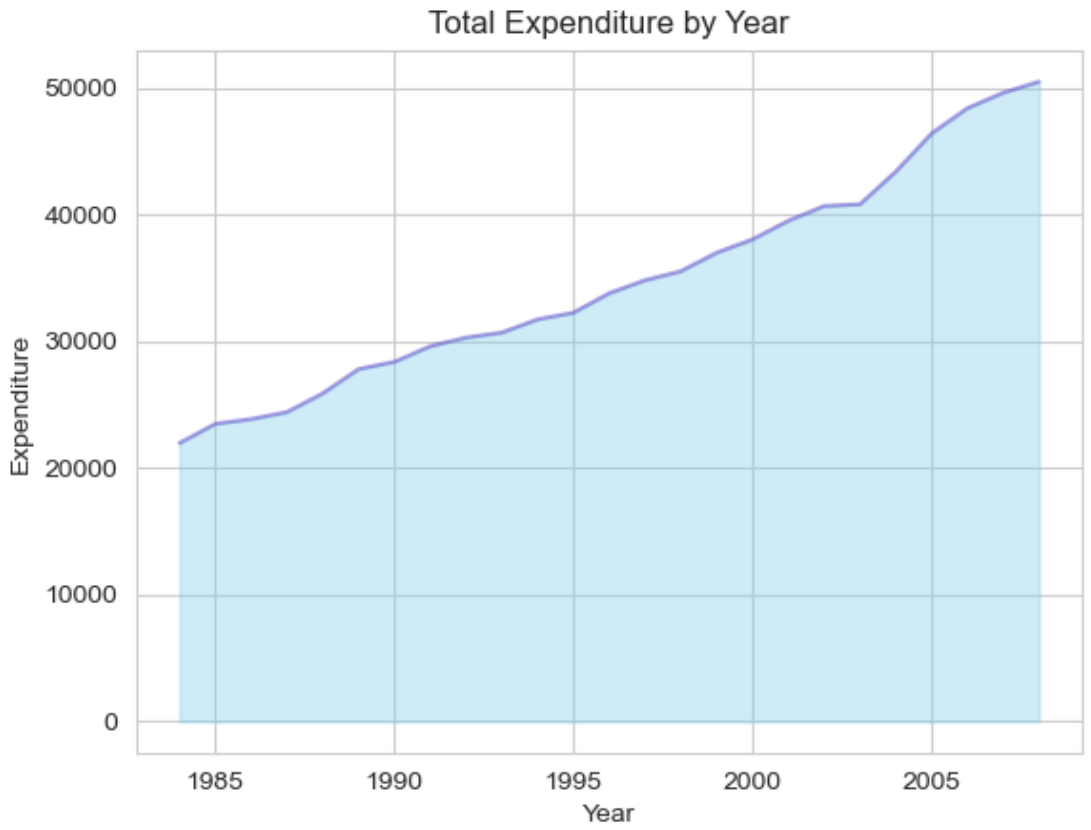


The plot of sum of Expenditure for Year (copy) Year. Color shows details about Category.

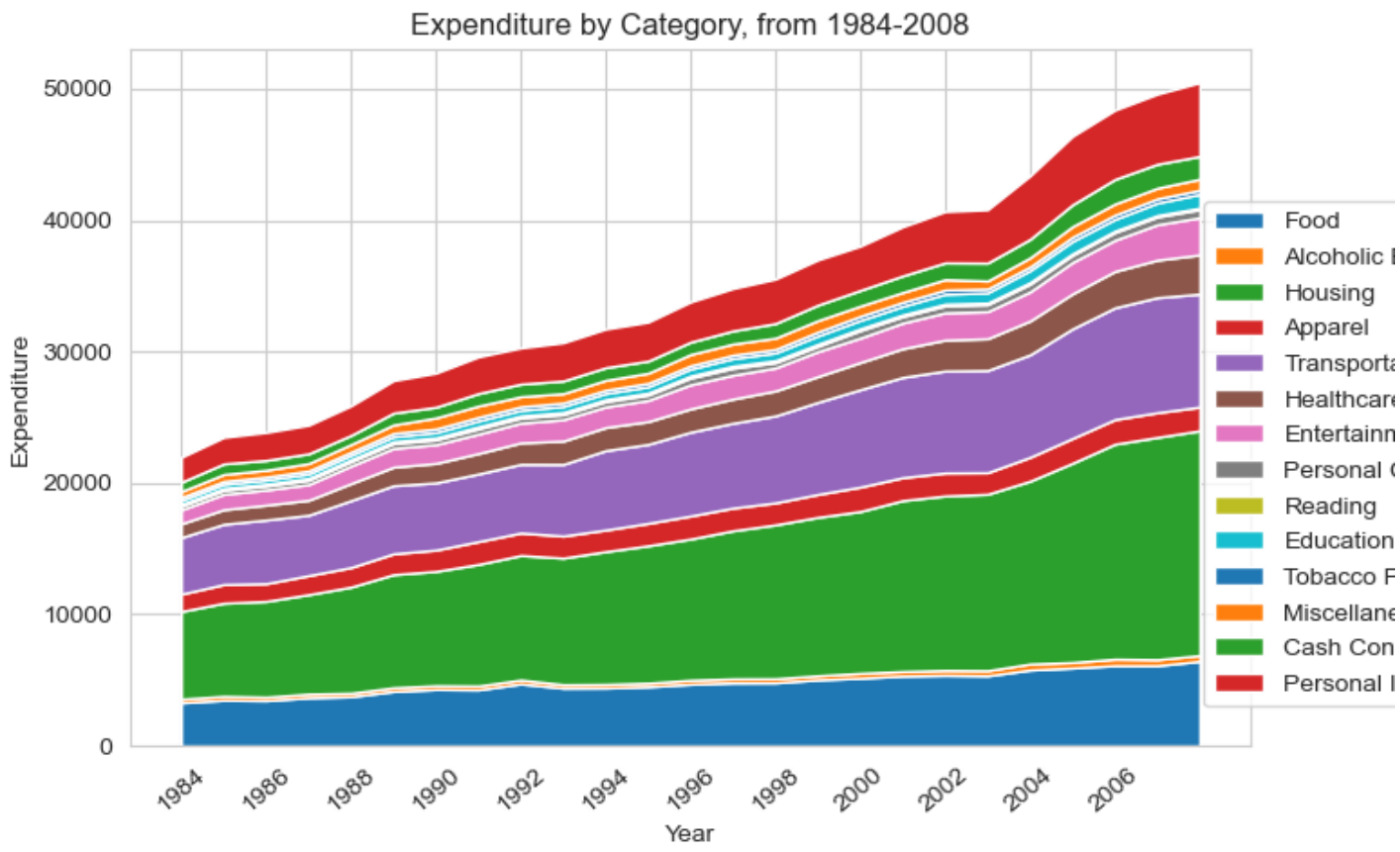
Python- Tree Map Chart



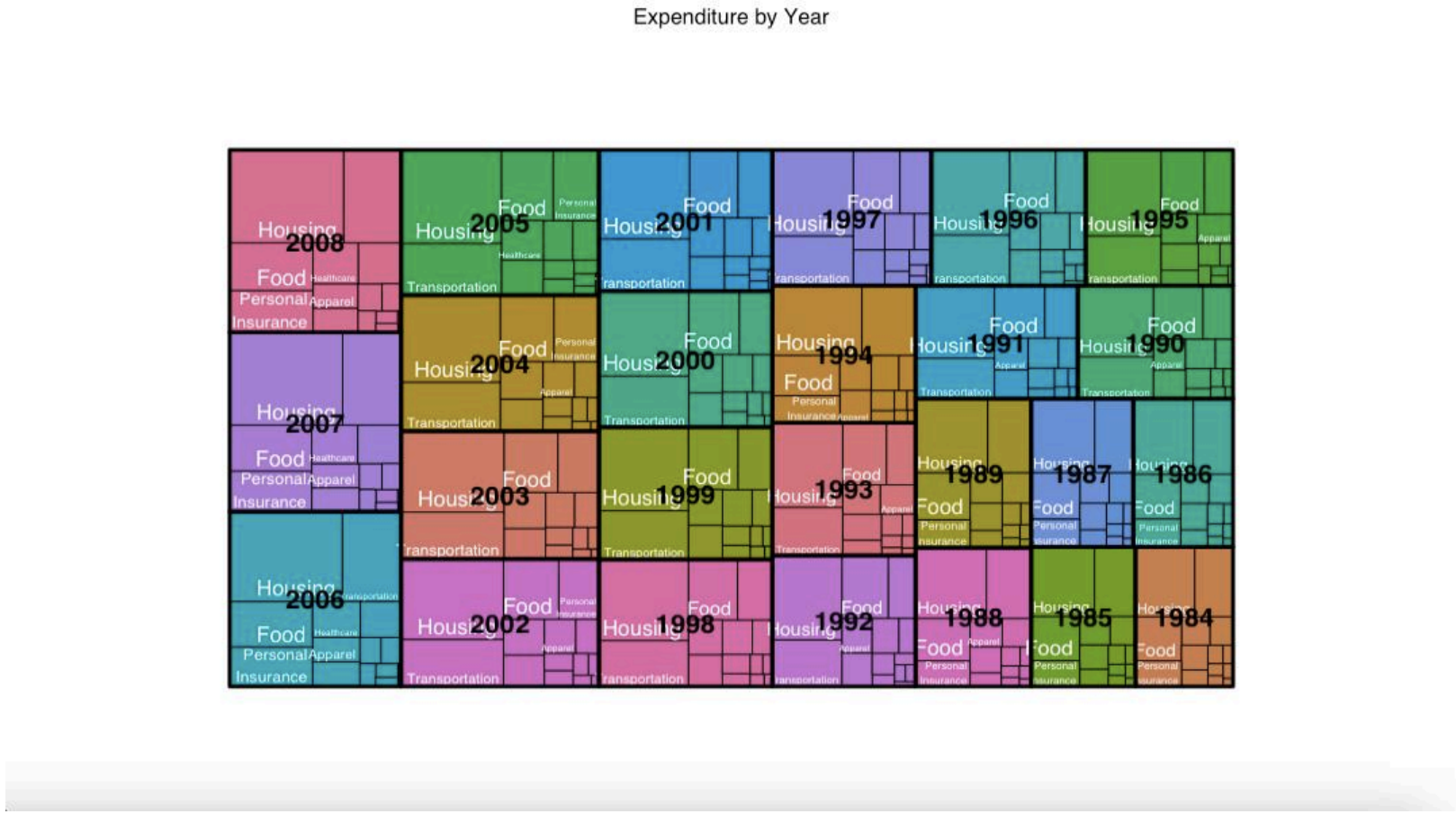
Python- Area Chart



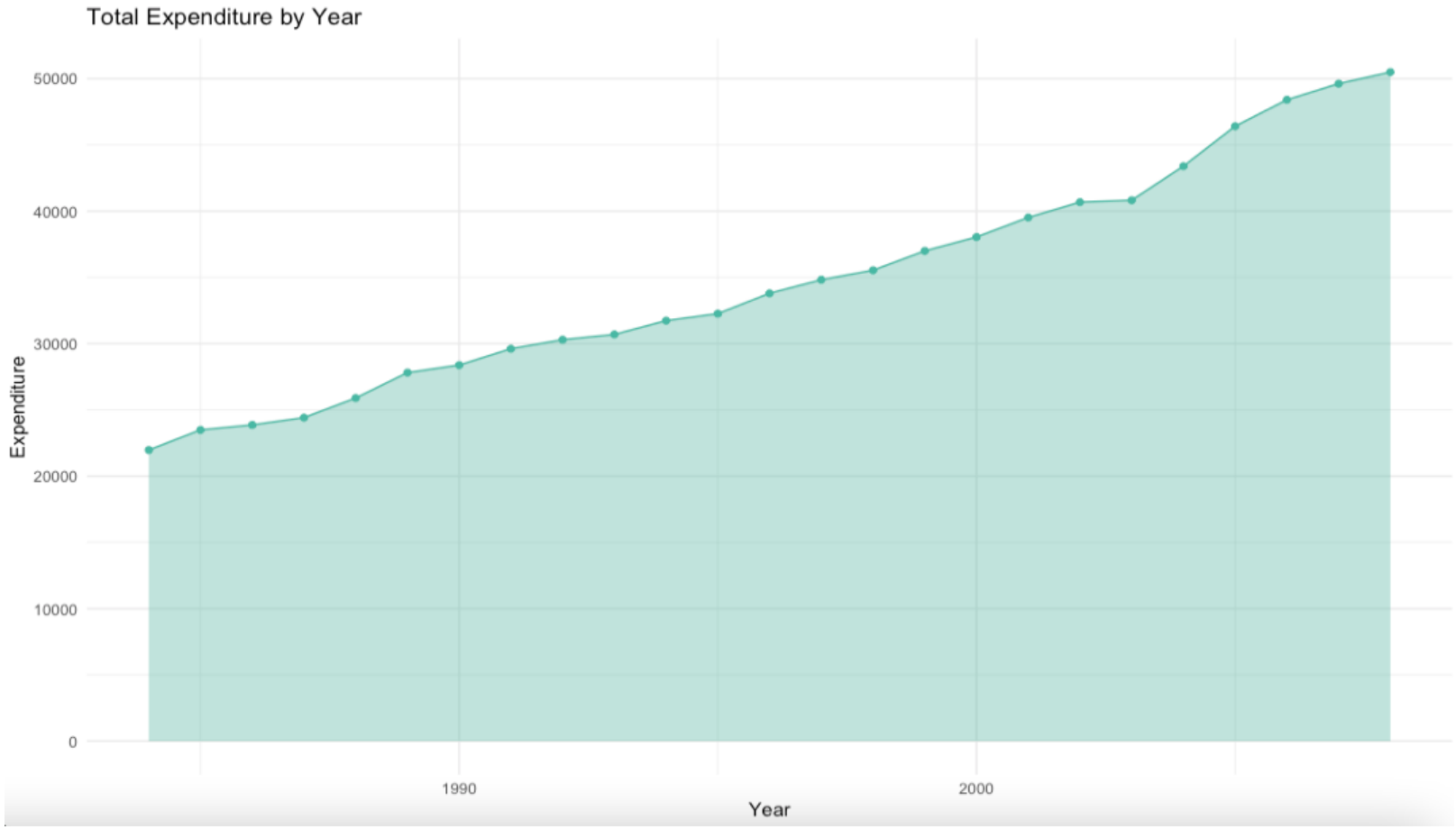
Python- Stacked Area Chart



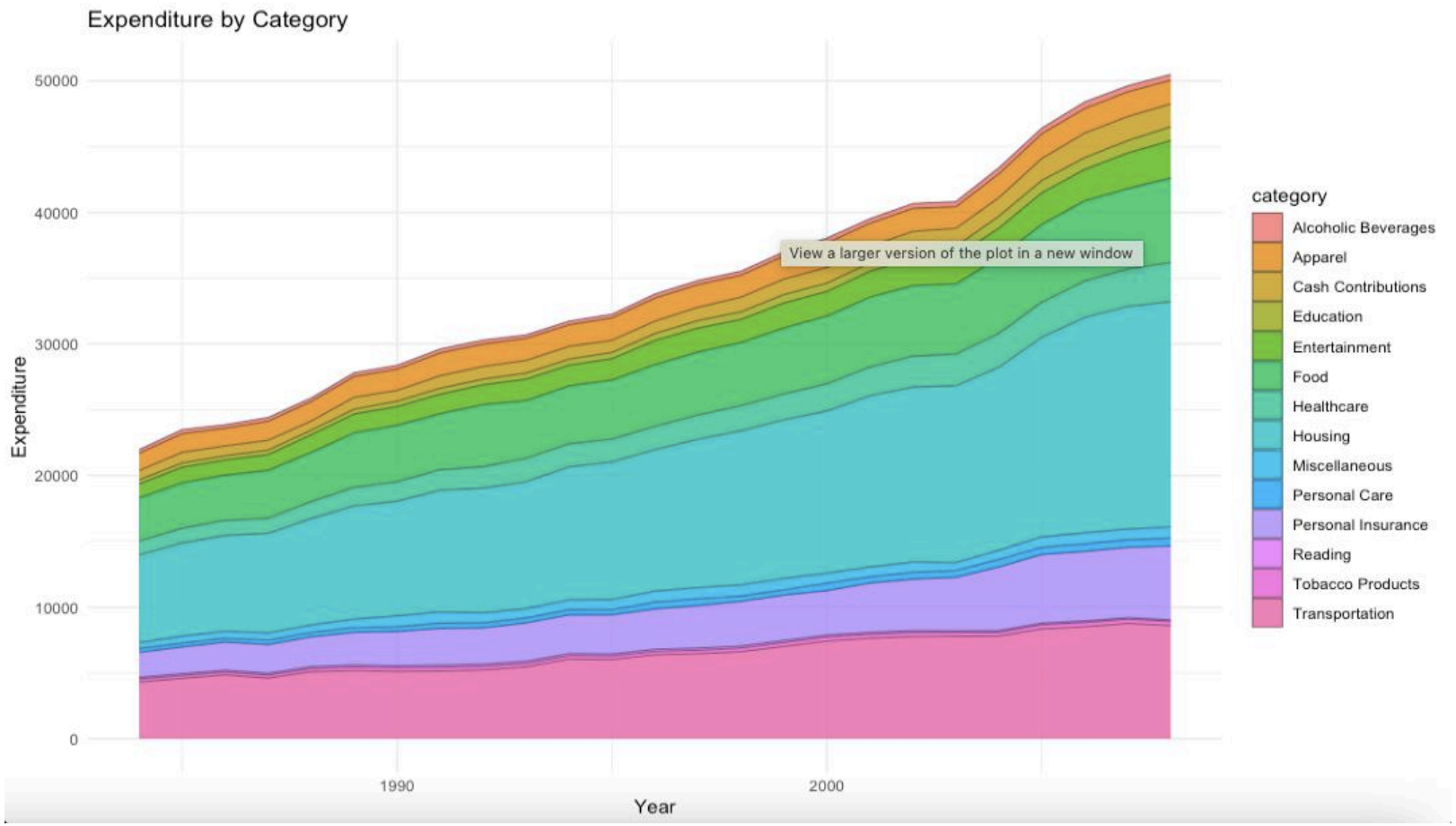
R- Tree Map Chart



R- Area Chart


Total Expenditure by Year
50000
40000
30000
20000
10000
0
Expenditure
1990
2000
Year

R – Stacked Area Chart



Gillian Tatreau

October 2023

Python Code

In [1]:
```
# load libraries
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns
import squarify
```

In [2]:
```
# load data
df = pd.read_table("/Users/gillian/Documents/Bellevue Grad Program/Fall 2023/DS
df.head()
```

Out[2]:

	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

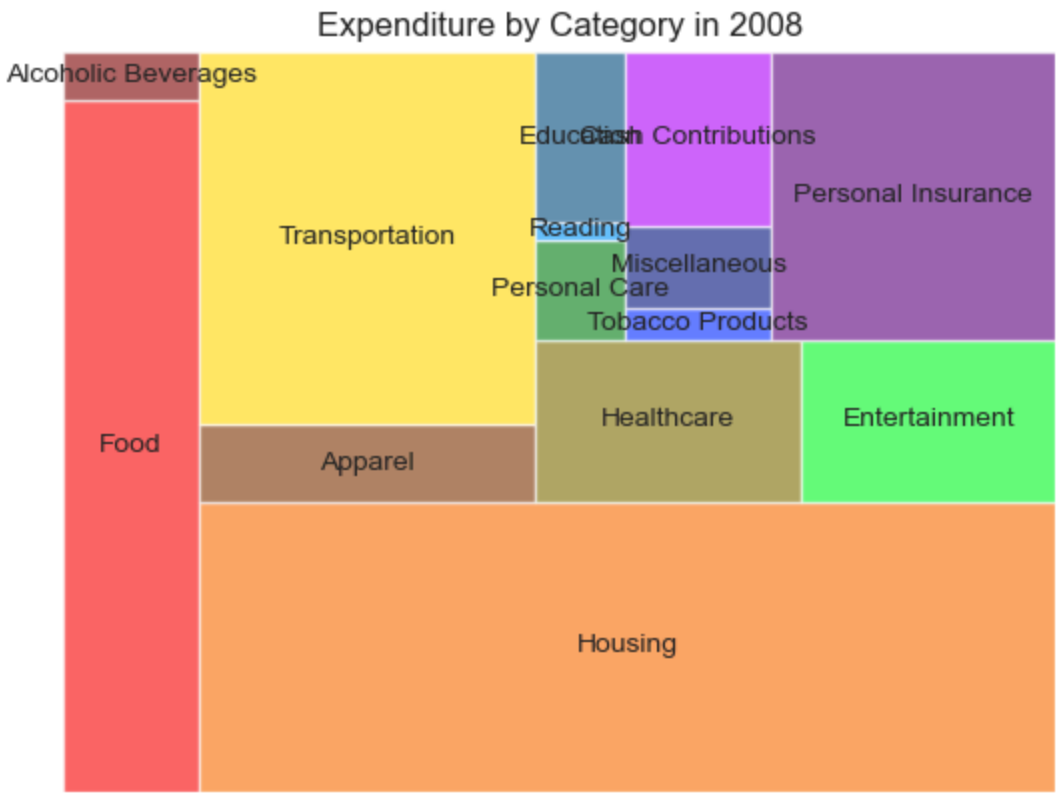
Treemap chart

In [3]:
```
# install squarify
# pip install squarify
```

In [4]:
```
df2 = df.loc[df['year'] == 2008]
```

In [5]:
```
colors = ['#fe0000', '#800001', '#fe6a00', '#803400', '#ffd800',
          '#806b00', '#00fe21', '#007f0e', '#0094fe', '#00497e',
          '#0026ff', '#001280', '#b100fe', '#590080']
```

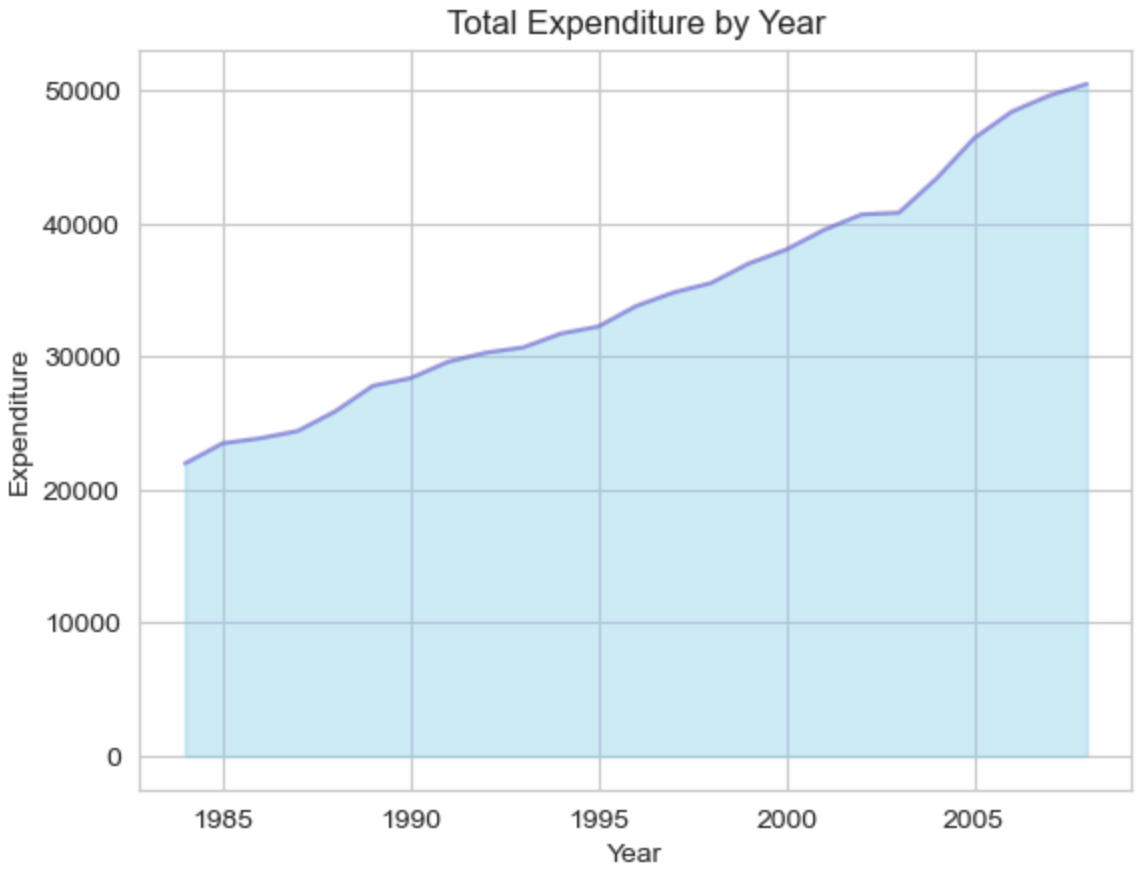
In [6]:
```
sns.set_style(style="whitegrid")
sizes= df2["expenditure"].values
label=df2["category"]
squarify.plot(sizes=sizes, label=label, alpha=0.6, color = colors).set(title="I
plt.axis('off')
plt.savefig('Python-TreemapChart.png')
plt.show()
```



Area Chart

In [7]:
```
df3 = df.groupby('year')['expenditure'].sum().reset_index(name='total')
```

In [8]:
```
plt.fill_between(df3['year'], df3['total'], color="skyblue", alpha=0.4)
plt.plot(df3['year'], df3['total'], color="Slateblue", alpha=0.6)
plt.title("Total Expenditure by Year")
plt.xlabel("Year")
plt.ylabel("Expenditure")
plt.savefig('Python-AreaChart.png')
plt.show()
```



Stacked Area Chart

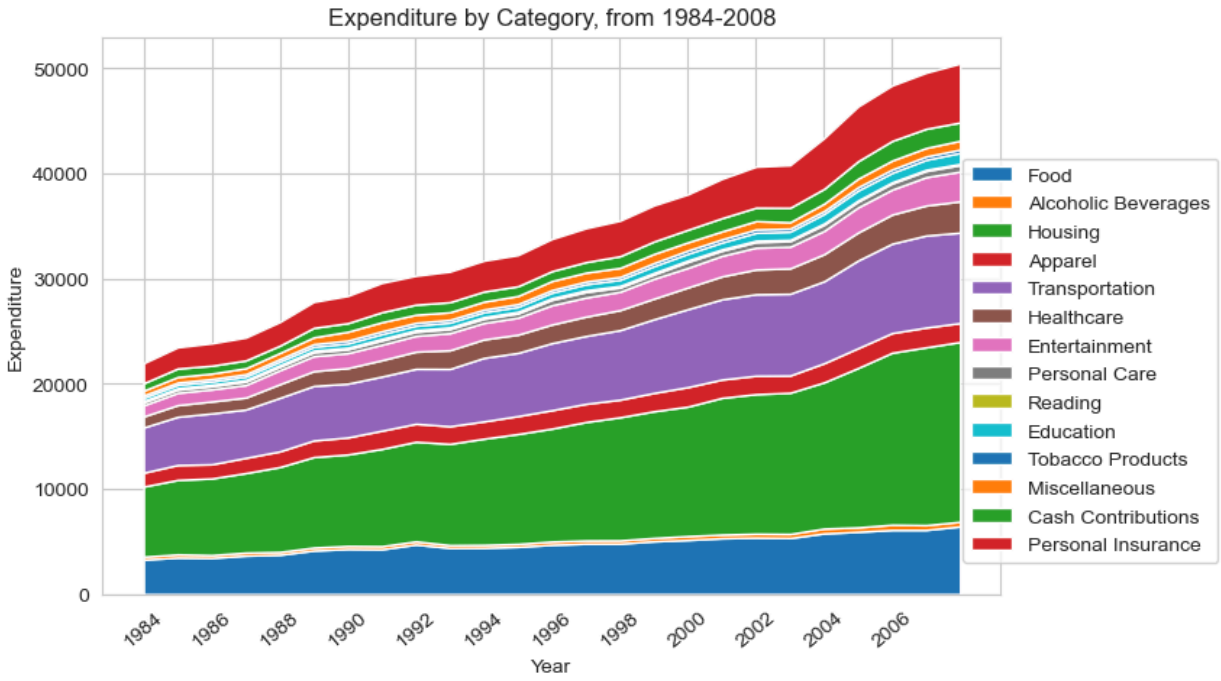
In [9]:
```
year = np.unique(df['year'].values)
year2 = np.flip(year)
```

In [10]:
```
labels = df['category'].unique().tolist()
```

In [11]:
```
food = (df[df['category']=="Food"]['expenditure'])
alc = (df[df['category']=="Alcoholic Beverages"]['expenditure'])
house = (df[df['category']=="Housing"]['expenditure'])
apparel = (df[df['category']=="Apparel"]['expenditure'])
transp = (df[df['category']=="Transportation"]['expenditure'])
health = (df[df['category']=="Healthcare"]['expenditure'])
ent = (df[df['category']=="Entertainment"]['expenditure'])
pers = (df[df['category']=="Personal Care"]['expenditure'])
read = (df[df['category']=="Reading"]['expenditure'])
edu = (df[df['category']=="Education"]['expenditure'])
tob = (df[df['category']=="Tobacco Products"]['expenditure'])
misc = (df[df['category']=="Miscellaneous"]['expenditure'])
cash = (df[df['category']=="Cash Contributions"]['expenditure'])
insure = (df[df['category']=="Personal Insurance"]['expenditure'])
```

In [12]:
```
fig = plt.figure(figsize=(8,5))
plt.stackplot(year2, food, alc, house, apparel, transp, health, ent, pers, rea
plt.legend(loc='upper center', bbox_to_anchor=(1.1, 0.8), shadow=False, ncol=1
plt.xticks(np.arange(1984,2008,step=2), rotation=40)
plt.title("Expenditure by Category, from 1984-2008")
plt.xlabel("Year")
plt.ylabel("Expenditure")
```

```
plt.savefig('Python-StackedAreaChart.png')
plt.show()
```



```
# R Code

# install treemap
# install.packages("treemap")

# load packages
library(treemap)
library(dplyr)
library(ggplot2)

# load data
df <- read.delim("/Users/gillian/Documents/Bellevue Grad Program/Fall
2023/DSC640/Weeks5&6/expenditures.txt")

# treemap
t <- treemap(df, index=c("year","category"),
             vSize="expenditure", type="index",
             fontsize.labels=c(15,12),
             fontface.labels=c(2,1),
             fontcolor.labels=c("black","white"),
             bg.labels=c("transparent"),              # Background color of labels
             align.labels=list(
               c("center", "center"),
               c("right", "bottom")),
             title = 'Expenditure by Year', fontsize.title=12
)
t

# area chart
# Group year by sum of values
agg_tbl <- df %>% group_by(year) %>%
  summarise(spend_sum = sum(expenditure),
            .groups = 'drop')
# Convert tibble to df
df2 <- agg_tbl %>% as.data.frame()

a <- ggplot(df2, aes(x=year, y=spend_sum)) +
  geom_area( fill="#69b3a2", alpha=0.4) +
  geom_line(color="#69b3a2") +
  geom_point(color="#69b3a2") +
  ggtitle("Total Expenditure by Year") +
  xlab('Year') + ylab('Expenditure') +
  theme_minimal()
a

# stacked area chart
s <- ggplot(df, aes(x=year, y=expenditure, fill=category)) +
  geom_area(colour="black", size=.2, alpha=.8) +
  ggtitle("Expenditure by Category") +
  xlab('Year') + ylab('Expenditure') +
  theme_minimal()
s
```