Expercise_Chart_Python

October 11, 2020

#
Week 5-6 - Assignment
Prepare - Tree Map, Area Chart & Stacked Area Chart
By
Shani Kumar

0.0.1 Introduction: Assignment Details

You need to submit 3 tree maps, 3 area charts and 3 stacked area charts using Tableau or PowerBI, Python and R using the data below (or your own datasets). You can also submit using D3. You can choose which library to use in Python or R, documentation is provided to help you decide and as you start to play around in the libraries, you will decide which you prefer.

0.0.2 Source Data

https://content.bellevue.edu/cst/dsc/640/datasets/ex3-2.zip

[1]:
```
# Impprt required libraries/packages
import numpy as np
import pandas as pd
import squarify
import matplotlib.pyplot as plt


# configure display of graph
%matplotlib inline
```

0.0.3 Load data into a dataframe

[2]:
```
# load the csv file as a data frame
expenditures = pd.read_csv('expenditures.txt', sep = '\t', header=0)
# summarize the shape of the dataset
print("Expenditures:\n")
print("Dataset Shape: ",expenditures.shape)
# see the sample of the data
print("Sample Data: ")
expenditures.head()
```

```
Expenditures:

Dataset Shape:  (350, 4)
Sample Data:
```

[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

[3]:
```
# load the csv file as a data frame
unemployement_rt = pd.read_csv('unemployement-rate-1948-2010.csv')
# summarize the shape of the dataset
print("Unemployment Rate:\n\nDataset Shape: ",unemployement_rt.shape)
# see the sample of the data
print("Sample Data: ")
unemployement_rt.head()
```

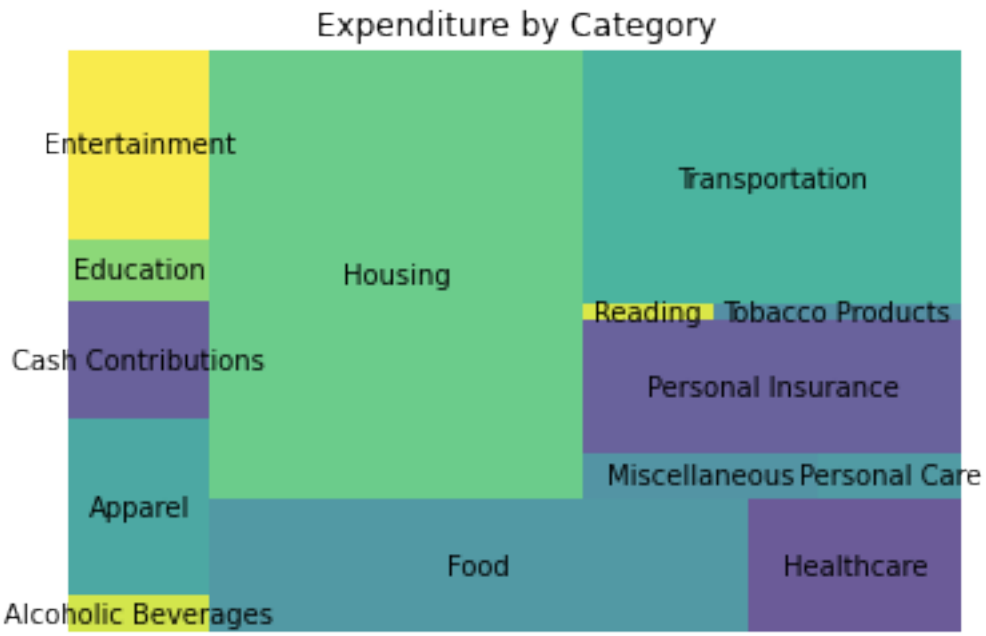
```
Unemployment Rate:

Dataset Shape:  (746, 4)
Sample Data:
```

[3]:

	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

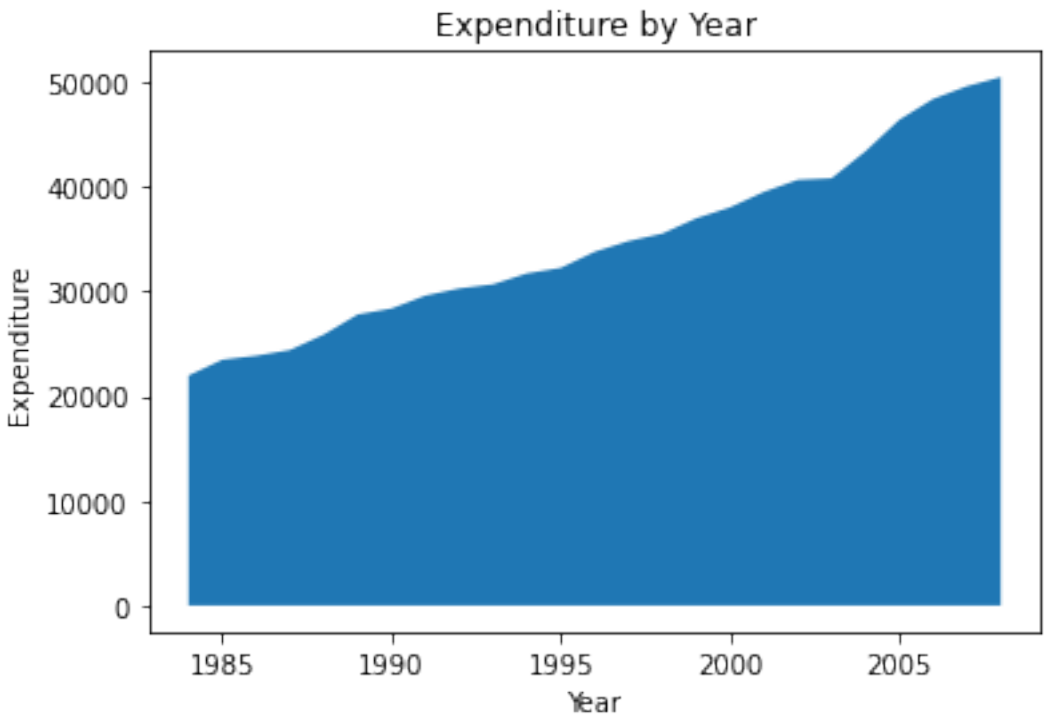
0.1 Tree Map

[4]:
```
# Calculate total expenditure for categories
expenditures_cat = expenditures.groupby(['category'])['expenditure'].sum().
 ↪reset_index()

# Plot tree map now
squarify.plot(sizes=expenditures_cat['expenditure'],
              label=expenditures_cat['category'],
              alpha=.8 )
plt.title('Expenditure by Category')
plt.axis('off')
plt.show()
```



0.2 Area Chart

[5]:
```
# Calculate total expenditure by year
expenditures_year = expenditures.groupby(['year'])['expenditure'].sum().
 ↪reset_index()

# Area Chart
plt.fill_between(expenditures_year['year'], expenditures_year['expenditure'])
plt.xlabel('Year')
plt.ylabel('Expenditure')
plt.title('Expenditure by Year')
plt.show()
```



0.3 Stacked Area Chart

[6]:
```
# Reorge the shape of dataset structure for stacked area chart
expenditures_reorg = expenditures.loc[:, expenditures.columns != 'sex'].
 ↪pivot(index='year', columns='category', values='expenditure')
expenditures_reorg.reset_index(level=0, inplace=True)

#Get label name
labs = expenditures_reorg.columns[1:].values.tolist()

# see the sample of the data
print("After Reorg: ")
expenditures_reorg.head()
```

```
After Reorg:
```

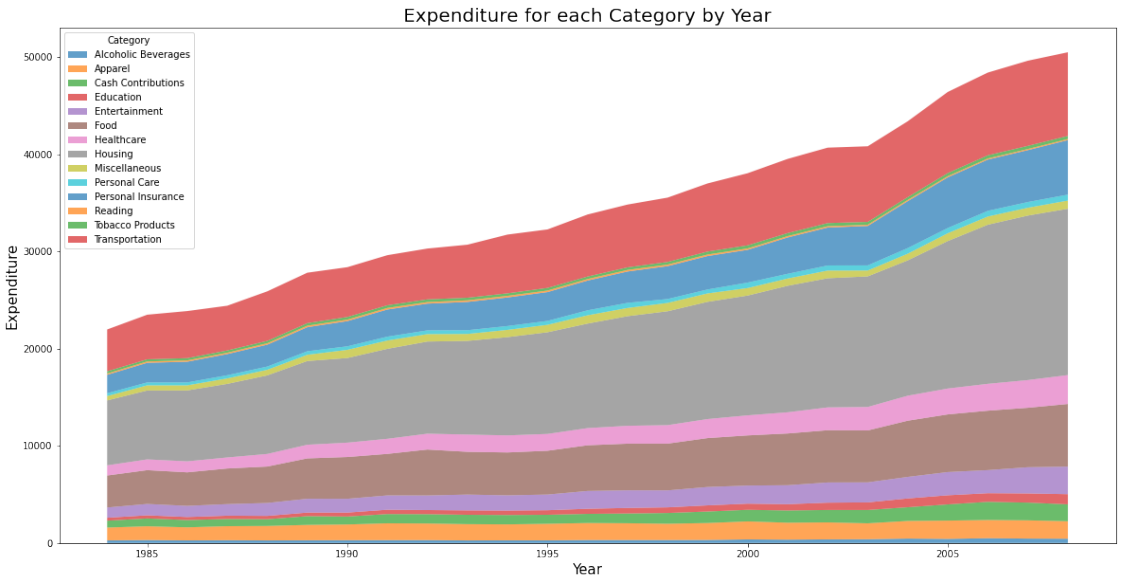
[6]:

category	year	Alcoholic Beverages	Apparel	Cash Contributions	Education	\
0	1984	275	1319	706	303	
1	1985	306	1420	805	321	
2	1986	271	1346	746	314	
3	1987	289	1446	741	337	
4	1988	269	1489	693	342	

```
category  Entertainment  Food  Healthcare  Housing  Miscellaneous  \
0                  1055  3290        1049     6674            451
1                  1170  3477        1108     7087            529
2                  1149  3448        1135     7292            522
3                  1193  3664        1135     7569            562
4                  1329  3748        1298     8079            578

category  Personal Care  Personal Insurance  Reading  Tobacco Products  \
0                   289                1897      132               228
1                   303                2016      141               219
2                   303                2127      140               230
3                   330                2175      142               232
4                   334                2249      150               242

category  Transportation
0                  4304
1                  4587
2                  4842
3                  4600
4                  5093
```

[7]:
```
# Stacked Area Chart
plt.figure(figsize=(20,10))
plt.stackplot(expenditures_reorg['year'],
              expenditures_reorg['Alcoholic Beverages'],
              expenditures_reorg['Apparel'],
              expenditures_reorg['Cash Contributions'],
              expenditures_reorg['Education'],
              expenditures_reorg['Entertainment'],
              expenditures_reorg['Food'],
              expenditures_reorg['Healthcare'],
              expenditures_reorg['Housing'],
              expenditures_reorg['Miscellaneous'],
              expenditures_reorg['Personal Care'],
              expenditures_reorg['Personal Insurance'],
              expenditures_reorg['Reading'],
              expenditures_reorg['Tobacco Products'],
              expenditures_reorg['Transportation'],
              labels=labs, alpha=0.7)
plt.title('Expenditure for each Category by Year', fontsize=20)
plt.xlabel('Year', fontsize=15)
plt.ylabel('Expenditure', fontsize=15)
plt.legend(title='Category', fontsize=10, ncol=1, loc = 'upper left')
```

[7]:
```
<matplotlib.legend.Legend at 0x7fdf4bfda208>
```


Expenditure for each Category by Year
Category
Alcoholic Beverages
Apparel
Cash Contributions
Education
Entertainment
Food
Healthcare
Housing
Miscellaneous
Personal Care
Personal Insurance
Reading
Tobacco Products
Transportation
Expenditure
0
10000
20000
30000
40000
50000
1985
1990
1995
2000
2005
Year