Week 9-10 - Assignment

Prepare - Heat maps, Spatial charts, and Contour charts

By
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Introduction: Assignment Details

You need to submit 3 heat maps, 3 spatial charts and 3 contour charts using Tableau or PowerBI, Python and R using the data below (or your own datasets). You can also use 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.

Source Data

https://content.bellevue.edu/cst/dsc/640/datasets/ex5-2.zip

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

# configure display of graph
%matplotlib inline
```

Load data into a dataframe

In [2]:
```
# load the csv file as a data frame
costco = pd.read_csv('costcos-geocoded.csv')
ppg_2008 = pd.read_csv('ppg2008.csv')

# summarize the shape of the dataset
print("Dataset Shape (Costco) : ",costco.shape)
# see the sample of the data
print("Sample Data: ")
costco.head()
```

```
Dataset Shape (Costco) :  (417, 6)
Sample Data:
```

Out[2]:

	Address	City	State	Zip Code	Latitude	Longitude
0	1205 N. Memorial Parkway	Huntsville	Alabama	35801-5930	34.743095	-86.600955
1	3650 Galleria Circle	Hoover	Alabama	35244-2346	33.377649	-86.812420
2	8251 Eastchase Parkway	Montgomery	Alabama	36117	32.363889	-86.150884
3	5225 Commercial Boulevard	Juneau	Alaska	99801-7210	58.359200	-134.483000
4	330 West Dimond Blvd	Anchorage	Alaska	99515-1950	61.143266	-149.884217

In [3]:
```
# summarize the shape of the dataset
print("Dataset Shape (ppg_2008) : ",ppg_2008.shape)
# see the sample of the data
print("Sample Data: ")
ppg_2008.head()
```

```
Dataset Shape (ppg_2008) :  (50, 21)
Sample Data:
```

Out[3]:

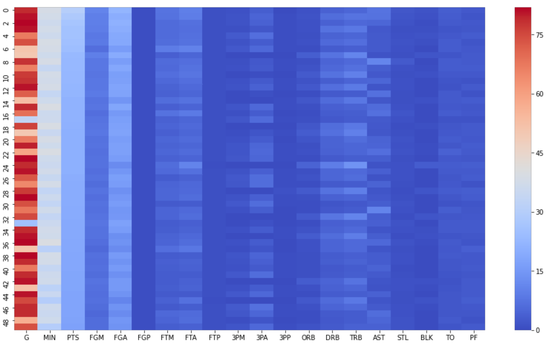
	Name	G	MIN	PTS	FGM	FGA	FGP	FTM	FTA	FTP	...	3PA	3PP	ORB	DRB	TRB	AST	STL	BLK	TO	PF
0	Dwyane Wade	79	38.6	30.2	10.8	22.0	0.491	7.5	9.8	0.765	...	3.5	0.317	1.1	3.9	5.0	7.5	2.2	1.3	3.4	2.3
1	LeBron James	81	37.7	28.4	9.7	19.9	0.489	7.3	9.4	0.780	...	4.7	0.344	1.3	6.3	7.6	7.2	1.7	1.1	3.0	1.7
2	Kobe Bryant	82	36.2	26.8	9.8	20.9	0.467	5.9	6.9	0.856	...	4.1	0.351	1.1	4.1	5.2	4.9	1.5	0.5	2.6	2.3
3	Dirk Nowitzki	81	37.7	25.9	9.6	20.0	0.479	6.0	6.7	0.890	...	2.1	0.359	1.1	7.3	8.4	2.4	0.8	0.8	1.9	2.2
4	Danny Granger	67	36.2	25.8	8.5	19.1	0.447	6.0	6.9	0.878	...	6.7	0.404	0.7	4.4	5.1	2.7	1.0	1.4	2.5	3.1

5 rows × 21 columns

Heat Map

In [4]:
```
# Create a Heat Map chart
plt.figure(figsize=(16,9))
sns.heatmap(ppg_2008.iloc[:,1:],cmap="coolwarm")
```

Out[4]:
```
<matplotlib.axes._subplots.AxesSubplot at 0x7fcd27eb8d68>
```

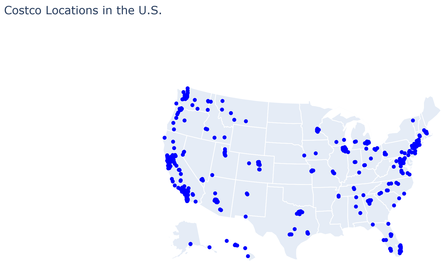


Spatial Plot

In [5]:
```
# spatial graph
import plotly.graph_objects as go
import pandas as pd

fig = go.Figure(data=go.Scattergeo(
    locationmode = 'USA-states',
    lon = costco['Longitude'],
    lat = costco['Latitude'],
    text = costco['City'],
    mode = 'markers',
    marker_color = "blue"
    ))

fig.update_layout(
        title = 'Costco Locations in the U.S.',
        geo_scope='usa'
    )
fig.show()
```



Countour plot

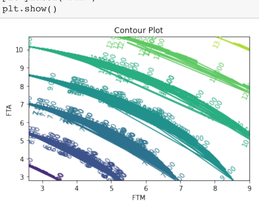
In [6]:
```
# define a function

def f(x, y):
    """
    Args: Two numpy arrays (x, y)
    Returns: Square root of sum of square of x and y
    """
    return np.sqrt(x**2 + y**2)

x = np.array(ppg_2008['FTM'])
y = np.array(ppg_2008['FTA'])

X, Y = np.meshgrid(x, y)
Z = f(X, Y)

plt.figure()
cp = plt.contour(X, Y, Z)
plt.clabel(cp, inline=True,
           fontsize=10)
plt.title('Contour Plot')
plt.xlabel('FTM')
plt.ylabel('FTA')
plt.show()
```



In [ ]:
```
```