Assignment 5.2 - Heat Maps, Spatial Charts & Contour Charts in Python

Date: 2/18/2023

Libraries

In [1]:
```
# Import libraries
import pandas as pd
import matplotlib.pyplot as plt
import matplotlib as mpl
import numpy as np
import chart_studio.plotly as py
import cufflinks as cf
import seaborn as sns
import plotly.offline as plo
```

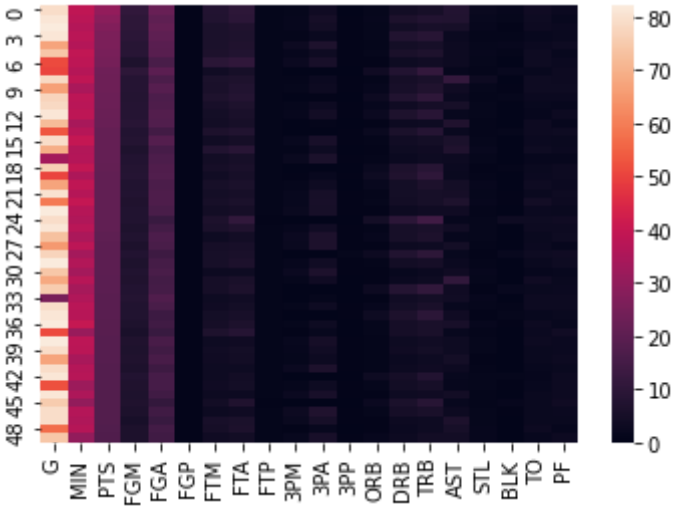
Datasets

In [2]:
```
# Read world population data
dirData = 'ex5-2/'
f_costco = 'costcos-geocoded.csv'
f_ppg = 'ppg2008.csv'

dir_costco = dirData+f_costco
dir_ppg = dirData+f_ppg

costco = pd.read_csv(dir_costco)
ppg = pd.read_csv(dir_ppg)

# summarize statewide Costco store count

costco_sum = pd.Series.to_frame(costco.groupby('State')['Address'].count())
costco_sum = costco_sum.rename({'Address':'store_count'}, axis=1, inplace=False
costco_sum = pd.DataFrame(costco_sum.to_records())
```

Heat Map - Python

In [3]:
```
sns.heatmap(ppg.iloc[:,1:])
```

Out[3]:
```
<AxesSubplot:>
```



Spatial Plot - Python

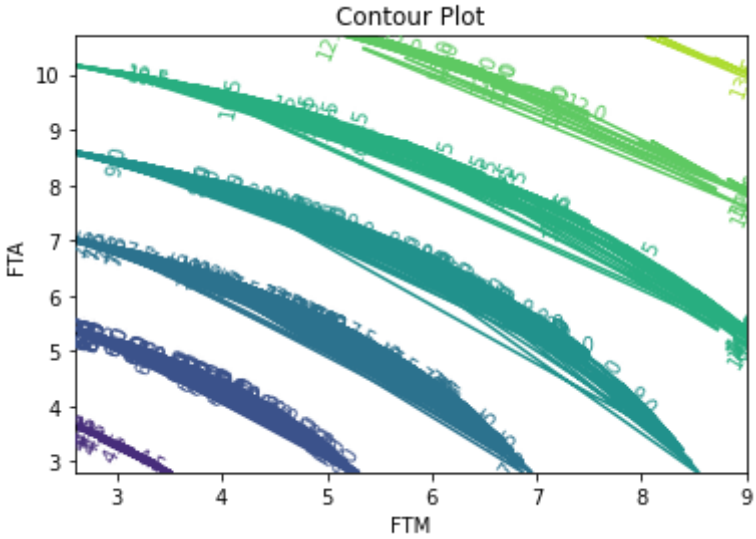
In [4]:
```
# plot the costco store count across US states

data=[dict(type='choropleth', autocolorscale = False,
           locations=costco_sum['State'], z=costco_sum['store_count'],
           locationmode='USA-states', colorscale='YlOrRd',
           colorbar=dict(title='Store Count'))]

layout = dict(title='Costco Store Count',
              geo=dict(scope='usa', projection=dict(type='albers usa'),
                       showlakes=True, lakecolor='rgb(66,165,245)'))

fig=dict(data=data, layout=layout)

plo.plot(fig)
```

Out[4]:
```
'temp-plot.html'
```

Countour plot - Python

In [5]:
```
%matplotlib inline

# define 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['FTM'])
y = np.array(ppg['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()
```



End of code