**EXPLANATION OF THE CODE**

The codes started by importing the required libraries.

import pandas as pd

import matplotlib.pyplot as plt

import numpy as np

Then the data was read from excel form to dataframe.

# reading the data in excel format to dataframe

data = pd.read\_excel("Book1.xlsx")

months, range occurrence and frequency occurrence columns from the read data was assigned to x, y1 ,y2,respectively

# Assigning the months,range occrance and

# frequency occurance columns to x,y1 ,y2,respectively

x = data["MONTHS"]

y1 = data["range occurance"]

y2 = data["Frequency occurance"]

And the assigned columns were used to plot the graph.

# Plotting the graph

fig, axs = plt.subplots(2, 1, figsize=(25, 20))

fig.suptitle("Occurrence rate for Range spread-F(top panel in black), and Frequency spread-F (bottom panel in red) of Belem 2018",

fontsize = 20)# this line of code assign title to the graph

# these lines of code plot the graph and label it RSF and FSF respectively

axs[0].bar(x,y1,color="black",label="RSF")

axs[1].bar(x,y2,color="red",label="FSF")

# these lines of code range(limit) on Y-axis from 0 - 100

axs[0].set\_ylim([0,100])

axs[1].set\_ylim([0,100])

# these lines of codes set ticks on y-axis with interval of 10

axs[0].set\_yticks(np.arange(0,101,10))

axs[1].set\_yticks(np.arange(0,101,10))

# these lines of codes set label to the y-axis

axs[0].set\_ylabel("% Occurance ", size=26, weight ='bold')

axs[1].set\_ylabel("% Occurance ", size=26, weight ='bold')

# these lines of codes setted legends to the two subplots

axs[0].legend(fontsize = 20)

axs[1].legend(fontsize = 20)

# these lines of codes setted ticks around the graph

axs[0].tick\_params(direction = "out")

sright1 = axs[0].secondary\_yaxis("right")

sright1.tick\_params(labelright = False)

stop1 = axs[0].secondary\_xaxis("top")

stop1.tick\_params(labeltop = False)

axs[1].tick\_params(direction = "out")

sright2 = axs[1].secondary\_yaxis("right")

sright2.tick\_params(labelright = False)

stop2 = axs[1].secondary\_xaxis("top")

stop2.tick\_params(labeltop = False)

# these lines of codes is responsible for the value of the occurance of each month

for i in range(len(x)):

axs[0].text(i,y1[i],y1[i],ha ="center",va ="bottom",fontsize = 20)

axs[1].text(i,y2[i],y2[i],ha ="center",va ="bottom",fontsize = 20)

axs[0].tick\_params(labelbottom = False)

fig.text(0.5, 0.04, 'MONTH', ha='center',size = 27 ,weight = 'bold') # this line of codes setted the x-axis label.

plt.savefig("dataplot.png", dpi=500)# this line of code is responsible for saving the graph as an image(png file).

plt.show() # this line of codes showed the graph on the screen.