GO_STP_5856 - Ashwin S

Assignment-6

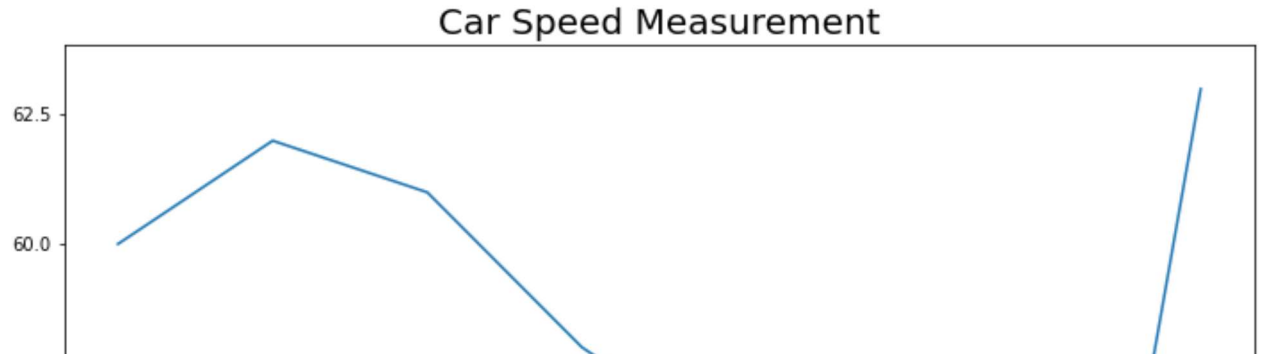
1. Load the necessary package for plotting using pyplot from matplotlib.

   Example - Days(x-axis) represents 8 days and Speed represents a car's speed. Plot a Basic line plot between days and car speed, put x axis label as days and y axis label as car speed and put title Car Speed Measurement

   Days = [1,2,3,4,5,6,7,8] Speed = [60,62,61,58,56,57,46,63]

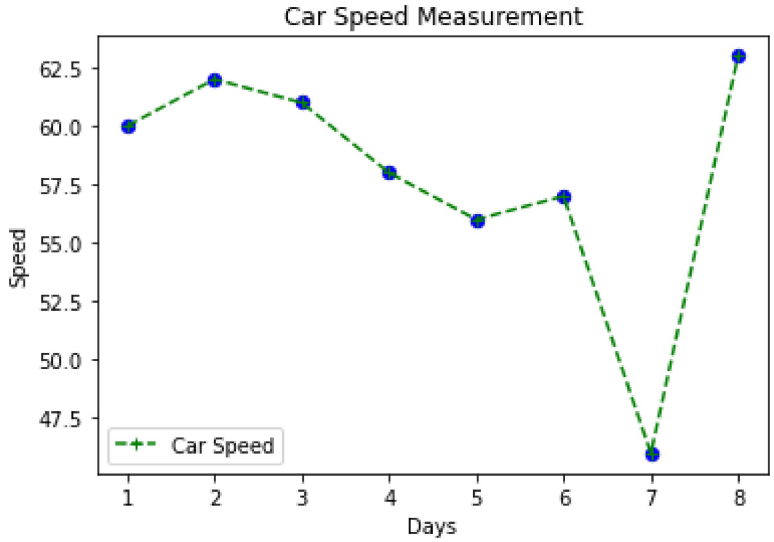
```
import matplotlib.pyplot as plt


Days = [1,2,3,4,5,6,7,8]
Speed = [60,62,61,58,56,57,46,63]
plt.figure(figsize=(12,10)) #creating a figure object and increasing figure size
plt.plot(Days, Speed)
plt.title('Car Speed Measurement',fontsize=20)
plt.xlabel('Days',fontsize=15)
plt.ylabel('Speed',fontsize=15)
plt.show()
```



2. Now to above car data apply some string formats like line style example green dotted line, marker shape like +, change markersize, markerface color etc.

```
plt.plot(Days, Speed,"--",marker='+',color='g',label='Car Speed') #plot the points as '+'
plt.scatter(Days,Speed,c='b',s=40) #plot data points in blue color of size 40
plt.xlabel('Days')
plt.ylabel('Speed')
plt.title("Car Speed Measurement")
plt.legend()#to display the label
plt.show()
```



3. Plot Axes Labels, Chart title, Legend, Grid in Car minimum, Maximum and average speed in 8 days

   days=[1,2,3,4,5,6,7,8]

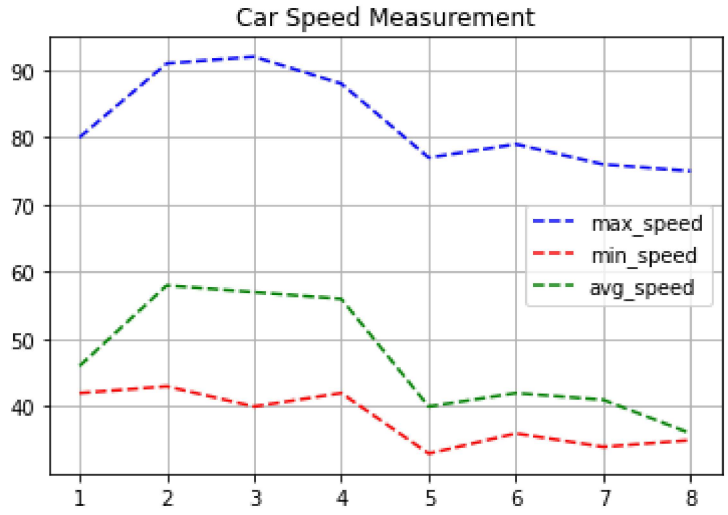
   max_speed=[80,91,92,88,77,79,76,75]

   min_speed=[42,43,40,42,33,36,34,35]

   avg_speed=[46,58,57,56,40,42,41,36]

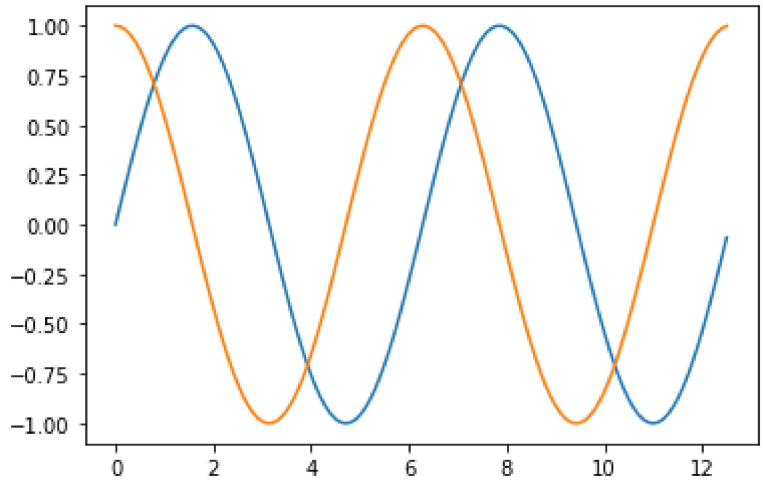
```
days=[1,2,3,4,5,6,7,8]
max_speed=[80,91,92,88,77,79,76,75]
min_speed=[42,43,40,42,33,36,34,35]
avg_speed=[46,58,57,56,40,42,41,36]
```

```
plt.plot(days,max_speed,"--",color='b',label="max_speed")
plt.plot(days,min_speed,"--",color='r',label="min_speed")
plt.plot(days,avg_speed,"--",color='g',label="avg_speed")
plt.grid()
plt.legend()
plt.title("Car Speed Measurement")
plt.show()
```



4. Plotting a basic sine graph by adding more features. Adding Multiple plots by Superimposition like cosine wave.

```
import numpy as np
x=(np.arange(0,4*np.pi,0.1)) #spacing
y=np.sin(x)
z=np.cos(x)
plt.plot(x,y)
plt.plot(x,z)
plt.show()
```



5. Plot Simple bar chart showing popularity of Programming Languages.

   Languages =['Python', 'SQL', 'Java', 'C++', 'JavaScript']

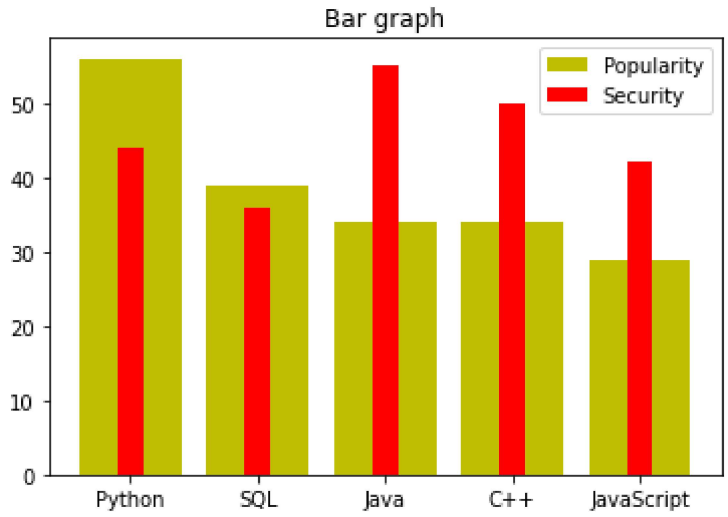
Popularity = [56, 39, 34, 34, 29]

Security = [44 ,36 ,55, 50, 42]

Plot Multiple Bars showing Popularity and Security of major Programming Languages. Also Create Horizontal bar chart using barh function.

```
Languages =['Python', 'SQL', 'Java', 'C++', 'JavaScript']
Popularity = [56, 39, 34, 34, 29]
Security = [44 ,36 ,55, 50, 42]

plt.bar(Languages,Popularity,color='y',width=0.8,label='Popularity')
plt.bar(Languages,Security,color='r',width=0.2,label='Security')
plt.title('Bar graph')
plt.legend()
plt.show()
```



Horizontal barh

```
plt.barh(Languages,Popularity,color='y',height=.8, label='Popularity')
plt.barh(Languages,Security,color='r',height=.2,label='Security')
plt.title('Bar graph')
plt.legend()
plt.show()
```

6. Plot Histogram, We have a sample data of Students marks of various Students,we will try to plot number of Students by marks range and try to figure out how many Students are average, below-average and Excellent.

   Marks = [61,86,42,46,73,95,65,78,53,92,55,69,70,49,72,86,64]

   Histogram showing Below Average, Average and Excellent distribution

   40-60: Below Average

60-80: Average

80-100: Excellent

A histogram is representation of the distribution of numerical data

```
Marks =np.array([ 61,86,42,46,73,95,65,78,53,92,55,69,70,49,72,86,64])
below_avg = Marks[np.logical_and(Marks >= 40, Marks < 60)] #comparing both arrays with tru
average = Marks[np.logical_and(Marks >= 60, Marks < 80)]
excellent = Marks[np.logical_and(Marks >= 80, Marks < 100)]
plt.hist(Marks,color="violet")
plt.title("Marksheet")
plt.xlabel('Marks')
plt.show()
```