**This practice is for visualization using Python Matplotlib Library**

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]​​​​​

 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.

 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]

4. 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.

5. 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 Execellent distribution

40-60: Below Average

60-80: Average

80-100: Excellent

6.  Titanic Data Set [Download Data](https://drive.google.com/file/d/1Xu7l9SCXznSPyZF9JJD4WTXwxAMNAog0/view?usp=sharing) ----- Github

 Load the data file

 (i) Create a pie chart presenting the male/female proportion

 (ii) Create a scatterplot with the Fare paid and the Age, differ the plot color by gender

Solutions

**1. Question**

import matplotlib.pyplot as plt # Import Required Package

Days = [1,2,3,4,5,6,7,8]

Speed = [60,62,61,58,56,57,46,63]

plt.plot(Days, Speed, color = 'blue') # For Create a Line Plot

plt.xlabel('Days')

plt.ylabel('Car Speed')

plt.title('Car Speed Measurement')

plt.show()

**2. Question**

Days = [1,2,3,4,5,6,7,8]

Speed = [60,62,61,58,56,57,46,63]

plt.plot(Days, Speed, color = 'blue', marker = 'o', ms = 20, mec = 'red', mfc = 'green', linestyle = 'dotted', linewidth = 3.5)

plt.xlabel('Days') # ms for marker size, mfc for marker face color, mec for border color

plt.ylabel('Car Speed')

plt.title('Car Speed Measurement')

plt.show()

**3. Question**

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.figure(figsize=(8,6))

plt.subplot(2,1,1)

plt.plot(Days, max\_speed, color = 'red', marker = '\*', ms = 10, mec = 'red', mfc = 'orange', label = 'Maximum Speed')

plt.xlabel('Days')

plt.ylabel('Maximum Speed')

plt.title('Car Speed Measurement')

plt.legend()

plt.grid()

plt.show()

plt.figure(figsize=(8,6))

plt.subplot(2,1,2)

plt.plot(Days, min\_speed, color = 'green', marker = 'o', ms = 10, mec = 'black', mfc = 'blue', label = 'Minimum Speed')

plt.xlabel('Days')

plt.ylabel('Minimum Speed')

plt.title('Car Speed Measurement')

plt.legend()

plt.grid()

plt.show()

plt.figure(figsize=(8,6))

plt.subplot(2,1,1)

plt.plot(Days, avg\_speed, color = 'yellow', marker = '^', ms = 10, mec = 'red', mfc = 'orange', label = 'Average Speed')

plt.xlabel('Days')

plt.ylabel('Maximum Speed')

plt.title('Car Speed Measurement')

plt.legend()

plt.grid()

plt.show()

**4. Question**

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

Popularity = [56, 39, 34, 34, 29]

Security = [44 ,36 ,55, 50, 42]

plt.subplot(2,1,1)

plt.bar(Languages, Popularity, width=0.5, color = 'orange', align='center')

plt.xlabel('Languages')

plt.ylabel('Popularity')

plt.legend(['Popularity'])

plt.show()

plt.subplot(2,1,2)

plt.bar(Languages, Security, width=0.5, color = 'red', align='center')

plt.xlabel('Languages')

plt.ylabel('Security')

plt.legend(['Security'])

plt.show()

**Horizontal Bar**

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

Popularity = [56, 39, 34, 34, 29]

Security = [44 ,36 ,55, 50, 42]

plt.subplot(2,1,1)

plt.barh(Languages, Popularity, color = 'g', align='center')

plt.xlabel('Languages')

plt.ylabel('Popularity')

plt.legend(['Popularity'])

plt.show()

plt.subplot(2,1,2)

plt.barh(Languages, Security, color = 'red', align='center')

plt.xlabel('Languages')

plt.ylabel('Security')

plt.legend(['Security'])

plt.show()

**5. Question**

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)]

avg\_marks = Marks[np.logical\_and(Marks >= 60, Marks < 80)]

exe\_marks = Marks[np.logical\_and(Marks >= 80, Marks <= 100)]

plt.hist(Marks)

plt.show()

print('Below Average Students Are : ',below\_avg.size)

print('Average Students Are : ',avg\_marks.size)

print('Execelent Students Are : ',exe\_marks.size)

**6. Question**

import pandas as pd

df = pd.read\_csv('/content/train.csv')

df.head()

df['Sex']

x = df.Sex.value\_counts()

x

plt.pie(x, autopct='%.0f%%')

plt.legend(['Male','Female'])

plt.title('Male And Female Proportion')

plt.show()

male = df[df['Sex']=='male']

male.Sex.value\_counts()

female = df[df['Sex']=='female']

female.Sex.value\_counts()

plt.scatter(male.Fare, male.Age, label = 'Male', marker = '\*')

plt.scatter(female.Fare, female.Age, label = 'Female', marker = '^')

plt.legend()

plt.xlabel('Fare')

plt.ylabel('Age')

plt.grid()

plt.show()