TASK 10   Use Matplotlib module for plotting in python.

Problem 1:

Mr.Singh wants to insert a sin wave plot in his project. Help Mr.Singh to draw **sine wave plot** using matplotlib.

PROGRAM

import numpy as np

import matplotlib.pyplot as plt

 # Generate x values from 0 to 2*pi

x = np.linspace(0, 2*np.pi, 1000)   # This line generates an array of 1000 evenly spaced values between

0 and 2π. It takes three arguments: the starting point (**0** in this case), the ending point (**2*np.pi** which is approximately 6.28319 and the number of points to generate (**1000**). It returns an array of equally spaced points between the start and end points, inclusive.

 # Generate y values corresponding to sine of x

y = np.sin(x)

 # Plot the sine wave
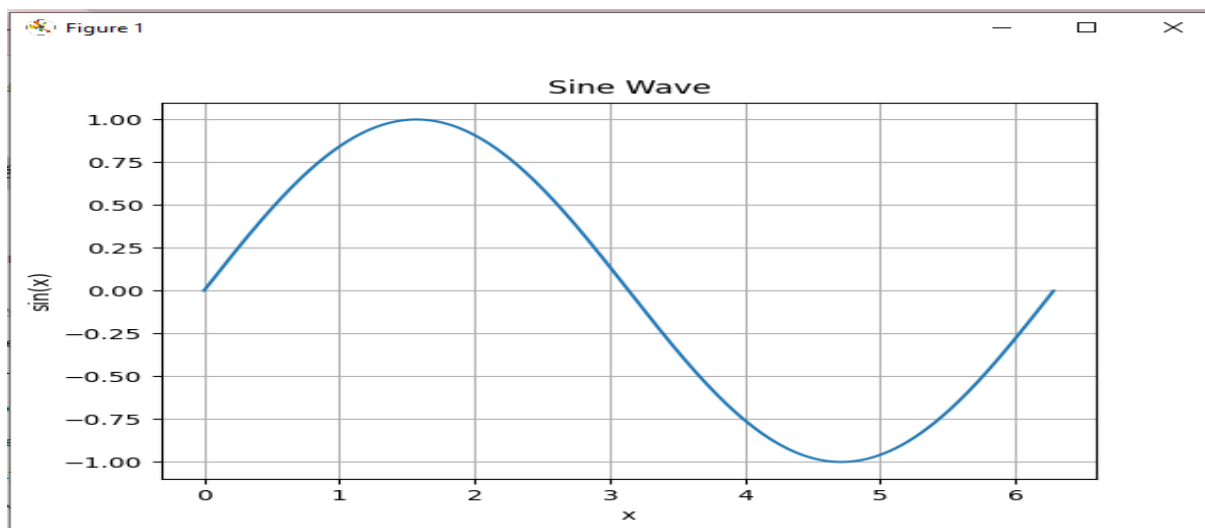
plt.plot(x, y)

plt.title('Sine Wave')

plt.xlabel('x')

plt.ylabel('sin(x)')

plt.grid(True)   **# Turns on the grid lines.**

plt.show()

OUTPUT

Problem 2:

Mr.Hari wants to insert a bar chart in his project. Help Mr.Hari to draw using matplotlib. The values for drawing bar chart are:

2 people from 140 to 145cm
5 people from 145 to 150cm
15 people from 151 to 156cm
31 people from 157 to 162cm
46 people from 163 to 168cm
53 people from 168 to 173cm
45 people from 173 to 178cm
28 people from 179 to 184cm
21 people from 185 to 190cm
4 people from 190 to 195cm

PROGRAM

import matplotlib.pyplot as plt

 # Define the data

intervals = ['140-145', '145-150', '151-156', '157-162', '163-168', '168-173', '173-178', '179-184', '185-190', '190-195']

frequencies = [2, 5, 15, 31, 46, 53, 45, 28, 21, 4]

 # Plot the histogram

plt.bar(intervals, frequencies, edgecolor='red')
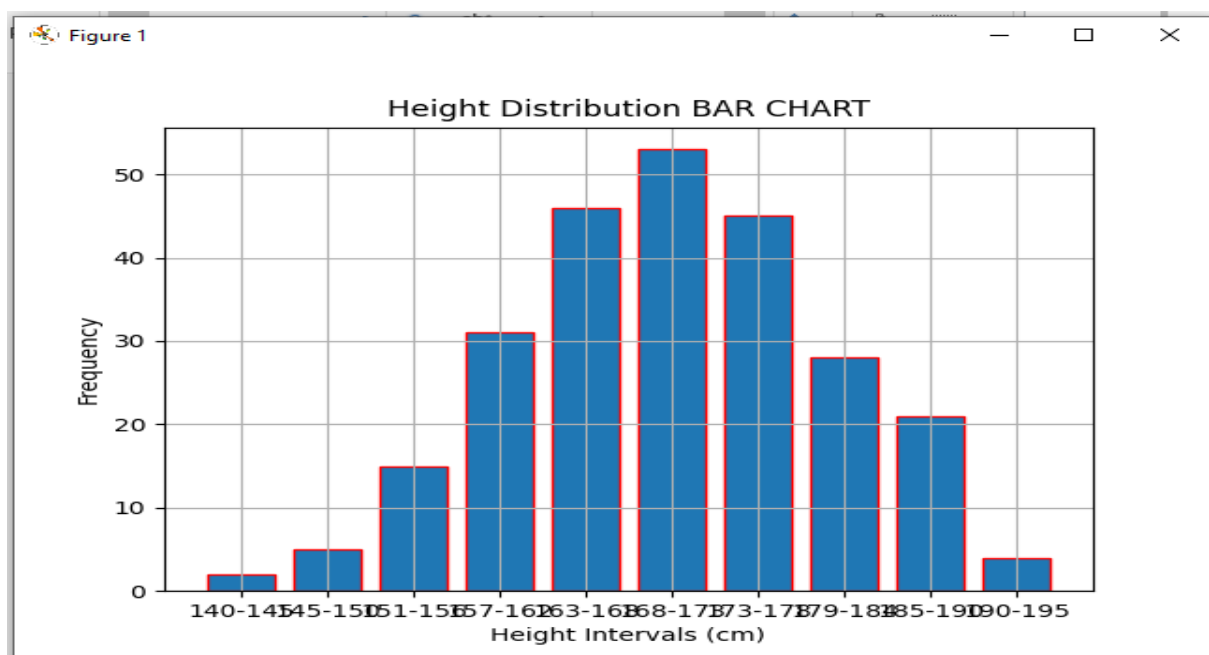
plt.xlabel('Height Intervals (cm)')

plt.ylabel('Frequency')

plt.title('Height Distribution Histogram')

plt.grid(True)

plt.show()

OUTPUT

Problem 3:

Mr. Krish wants to insert scatter graph in his project. Help Mr. Krish to draw a scatter graph using matplotlib. The values for drawing scatter graph are:

X=[5,7,8,7,2,17,2,9,4,11,12,9,6]

y=[99,86,87,88,111,86,103,87,94,78,77,85,86]

PROGRAM

import matplotlib.pyplot as plt

 # Define the data

x= [5, 7, 8, 7, 2, 17, 2, 9, 4, 11, 12, 9, 6]

y = [99, 86, 87, 88, 111, 86, 103, 87, 94, 78, 77, 85, 86]

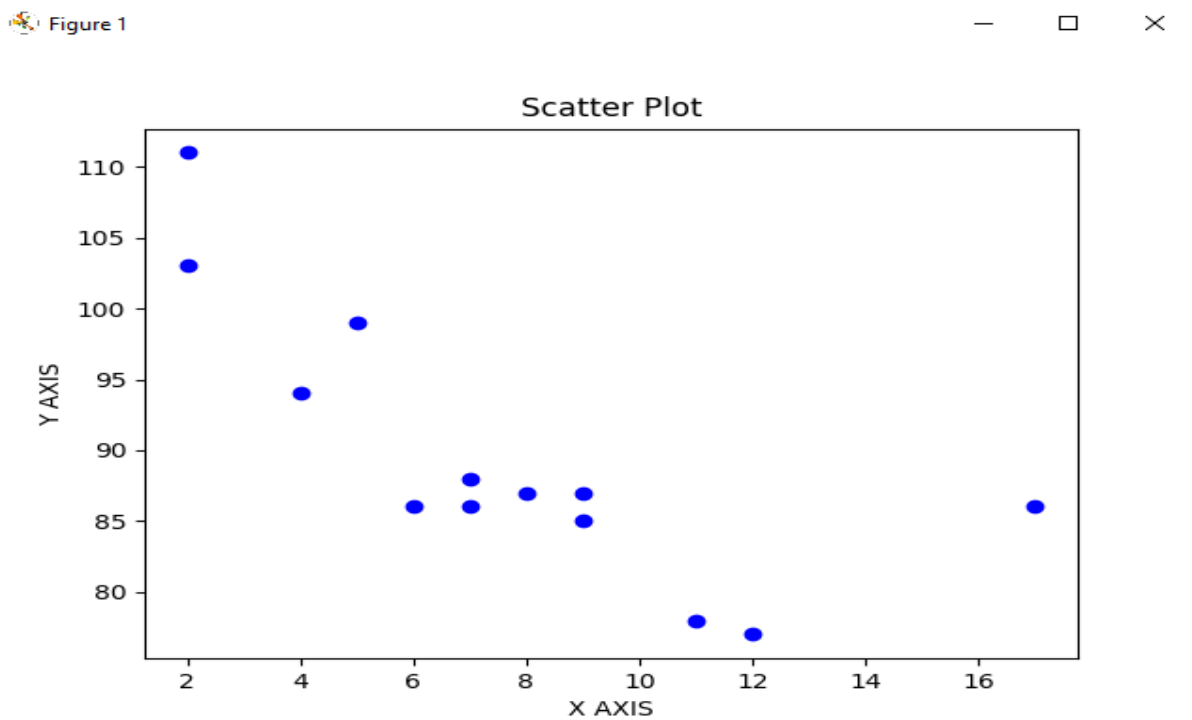**# Plot the scatter graph**

plt.scatter(x, y, color='blue')

plt.xlabel('X AXIS')

plt.ylabel('Y AXIS')

plt.title('Scatter Plot')

plt.show()

OUTPUT

Problem 4:

Mr. Krishnan wants to insert pie graph in his project. Help Mr. Krishnan to draw a pie chart using matplotlib. The values for drawing pie graph are:
W=35,x=25,y=25,Z=15

PROGRAM

import matplotlib.pyplot as plt

 # Define the data

sizes = [35, 25, 25, 15]

mylabels = ['w', 'x', 'y', 'z']

myexplode = [0.2, 0, 0, 0]

 # Plot the pie chart

plt.pie(sizes, labels=mylabels, explode=myexplode, shadow = True, autopct='%1.1f%%') # automatic percentage formatting".It is used to format the percentage values displayed on each slice

plt.title('Pie Chart')

plt.show()

OUTPUT