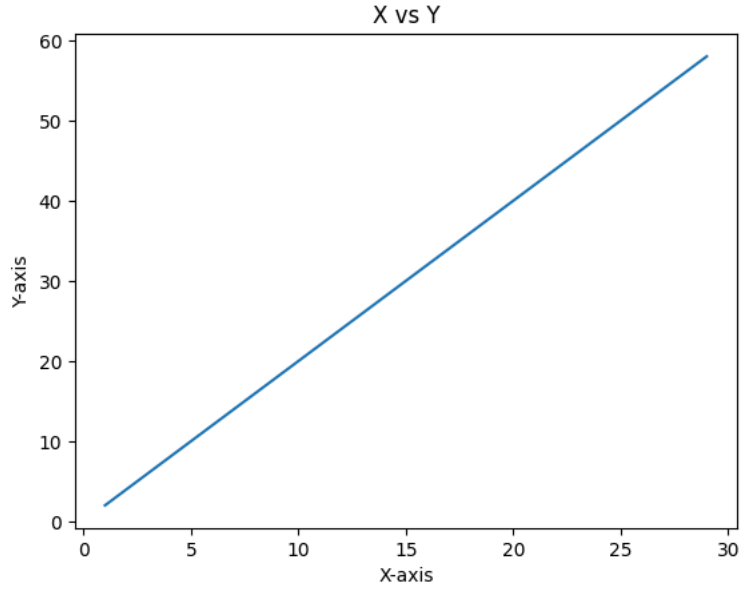
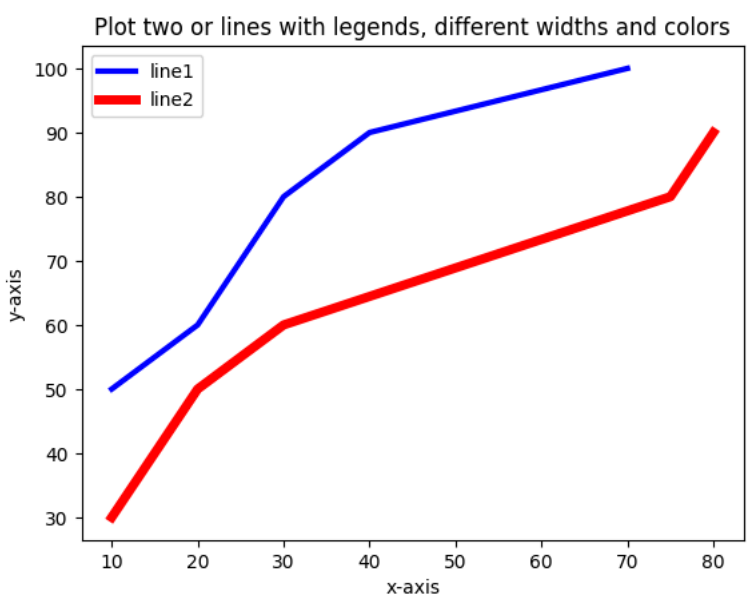
```
#MATLPLOTLIB TASKS EXCERICE 1

# 1.  Write a Python program to draw a line with suitable label in the x axis, y axis and a title. The
# values of y should be twice of x. The range of x: 1 to 30.

import matplotlib.pyplot as plt
import numpy as np

X = range(1,30)
Y = [value * 2 for value in X]

print("VALUES OF X:")
print(*range(1,30))

print("values of y(twice of x):")
print(Y)


plt.plot(X,Y)
plt.xlabel('X-axis')
plt.ylabel('Y-axis')

plt.title('X vs Y')

plt.show()
```

```
VALUES OF X:
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29
values of y(twice of x):
[2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58]
```

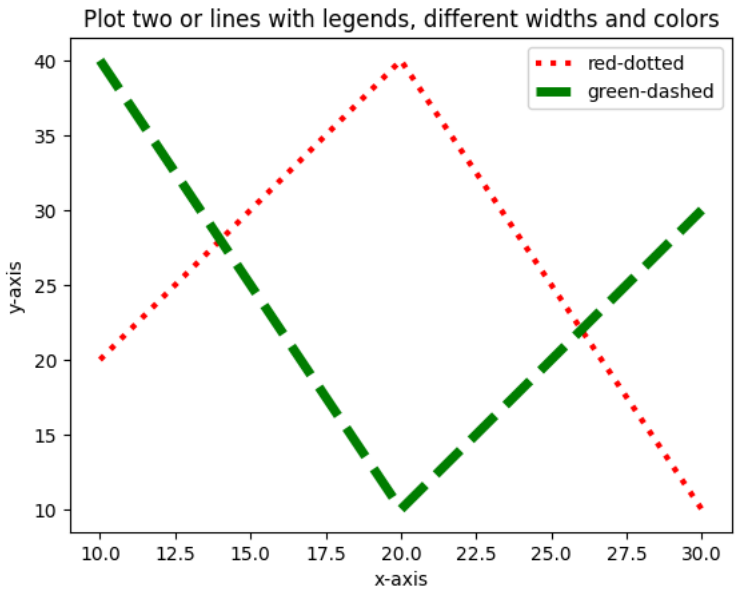



```
# 2.# : Write a Python program to draw line charts of the financial data of a company between
# October 3, 2016 to October 7, 2016.
# Sample Financial data (fdata.csv) as it appears in the .csv file:
# Date,Open,High,Low,Close
# 10-03-16,774.25,776.065002,769.5,772.559998
# 10-04-16,776.030029,778.710022,772.890015,776.429993
# 10-05-16,779.309998,782.070007,775.650024,776.469971
# 10-06-16,779,780.47998,775.539978,776.859985
# 10-07-16,779.659973,779.659973,770.75,775.080017

data = {
    "Date": ["10-03-16", "10-04-16", "10-05-16", "10-06-16", "10-07-16"],
    "Open": [774.25, 776.030029, 779.309998, 779, 779.659973],
    "High": [776.065002, 778.710022, 782.070007, 780.47998, 779.659973],
    "Low": [769.5, 772.890015, 775.650024, 775.539978, 770.75],
    "Close": [772.559998, 776.429993, 776.469971, 776.859985, 775.080017],
}

# Create a DataFrame
df = pd.DataFrame(data)
```

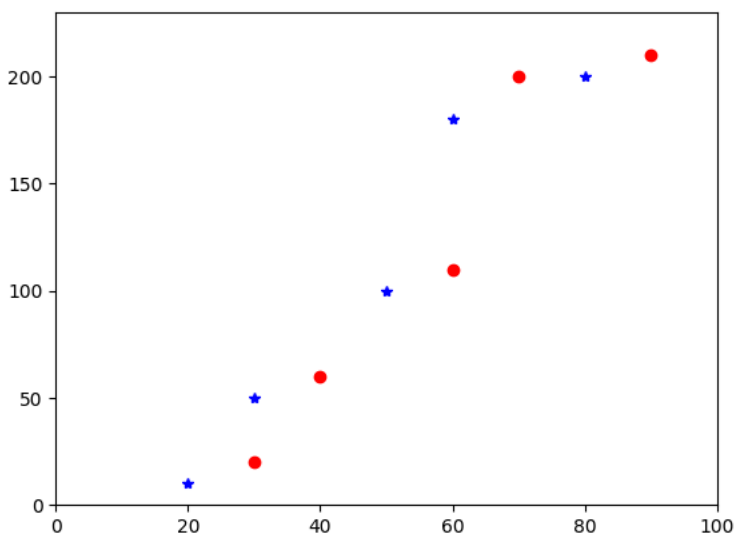
```
# Display the DataFrame
print(df)


# 3.Write a Python program to plot two or more lines with legends, different widths and colours.


x1 = [10,20,30,40,70,]
y1 = [50,60,80,90,100]

x2 = [10,20,30,75,80]
y2 = [30,50,60,80,90]


plt.xlabel('x-axis')
plt.ylabel('y-axis')

plt.title('Plot two or lines with legends, different widths and colors')

plt.plot(x1,y1, color = 'blue', linewidth = 3, label = 'line1')
plt.plot(x2,y2, color = 'red', linewidth = 5, label = 'line2')

plt.legend()
plt.show()
```




```
#task4

x1 = [10,20,30]
y1=[20,40,10]

x2= [10,20,30]
y2 = [40,10,30]

plt.xlabel('x-axis')
plt.ylabel('y-axis')

plt.title('Plot two or lines with legends, different widths and colors')

plt.plot(x1,y1,color = 'red', linewidth = 3, label = 'red-dotted', linestyle = 'dotted')
plt.plot(x2,y2,color = 'green', linewidth = 5, label = 'green-dashed', linestyle = 'dashed')

plt.legend()
plt.show()
```



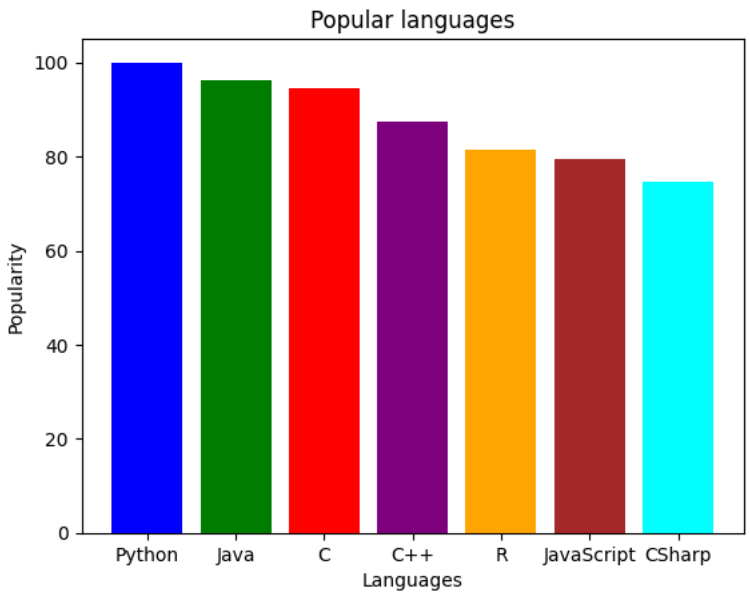

```
#task5 Write a Python program to plot quantities which have an x and y position given the following
# # arrays of x and y values:

x1=[20,30,50,60,80]
y1 =[10,50,100,180,200]

x2= [30,40,60,70,90]
y2=[20,60,110,200,210]


plt.axis([0,100,0,230])

plt.plot(x1,y1, "b*")
plt.plot(x2,y2,"ro")
plt.show()
```



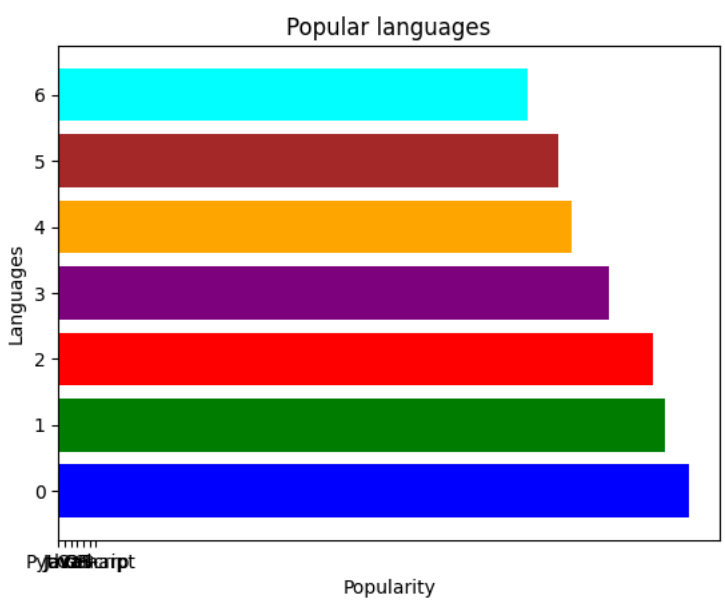

```
#task6 Write a Python program to create multiple subplots.

fig = plt.figure()
fig.subplots_adjust(bottom = 0.020, left = 0.020, top = 0.900, right = 0.900)

plt.subplot(2,1,1)
plt.xticks(()),plt.xticks(())

plt.subplot(2,3,4)
plt.xticks(()),plt.yticks(())
```

```
plt.subplot(2,3,5)
plt.xticks(()),plt.yticks(())

plt.subplot(2,3,6)
plt.xticks(()),plt.yticks(())

plt.show()
```

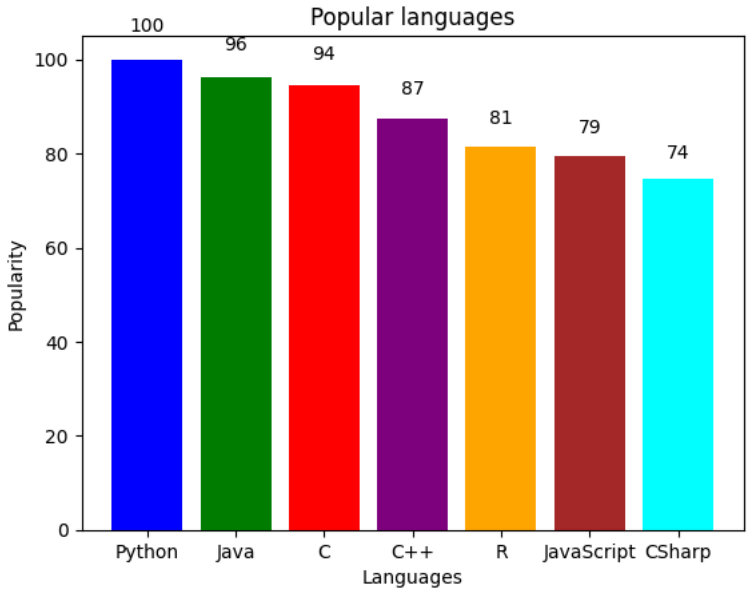

```
# #task 7 Write a Python programming to display a bar chart of the popularity of programming Languages.
# Sample data on the popularity of programming languages 2019 according to IEEE: Programming languages: Python, Java, C, C++, R,


x =[ "Python", "Java", 'C', "C++", "R", "JavaScript", 'CSharp']
popularity = [100, 96.3, 94.4, 87.5, 81.5, 79.4, 74.5]

colors = ['blue', 'green', 'red', 'purple', 'orange', 'brown', 'cyan']

x_pos = [i for i, _ in enumerate(x)]
plt.bar(x_pos, popularity, color = colors)
plt.xlabel("Languages")
plt.ylabel("Popularity")
plt.title("Popular languages")
plt.xticks(x_pos, x)
plt.show()
```



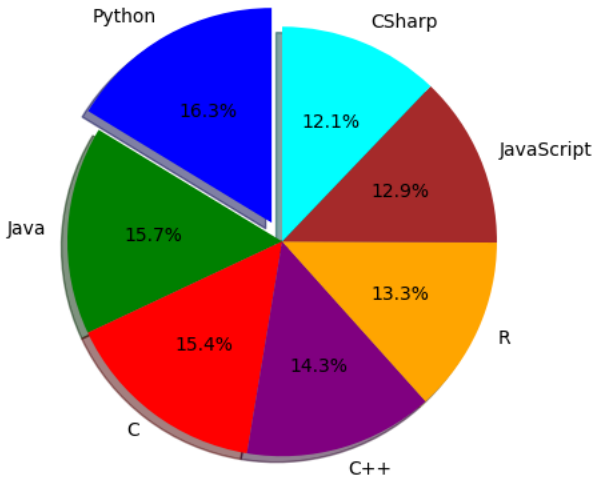
```
#task 8

x =[ "Python", "Java", 'C', "C++", "R", "JavaScript", 'CSharp']
popularity = [100, 96.3, 94.4, 87.5, 81.5, 79.4, 74.5]

colors = ['blue', 'green', 'red', 'purple', 'orange', 'brown', 'cyan']

x_pos = [i for i, _ in enumerate(x)]
plt.barh(x_pos, popularity, color = colors)
plt.ylabel("Languages")
plt.xlabel("Popularity")
plt.title("Popular languages")
plt.xticks(x_pos, x)
plt.show()
```



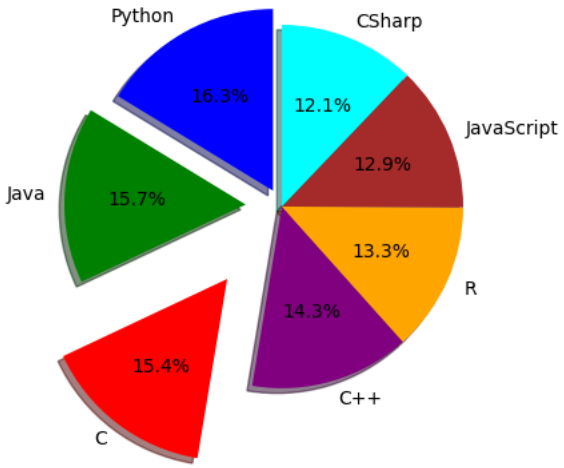

```
#task 10 Write a Python programming to display a bar chart of the popularity of programming Languages. Attach a text label above
import matplotlib.pyplot as plt
import numpy as np


x =[ "Python", "Java", 'C', "C++", "R", "JavaScript", 'CSharp']
popularity = [100, 96.3, 94.4, 87.5, 81.5, 79.4, 74.5]

x_pos = [i for i, _ in enumerate(x)]

fig, ax = plt.subplots()

rects1 = ax.bar(x_pos, popularity,color = ['blue', 'green', 'red', 'purple', 'orange', 'brown', 'cyan'])

colors = ['blue', 'green', 'red', 'purple', 'orange', 'brown', 'cyan']

plt.xlabel("Languages")
plt.ylabel("Popularity")
plt.title("Popular languages")
plt.xticks(x_pos, x)



def autolabel(rects):
  for rect in rects:
    height = rect.get_height()
    ax.text(rect.get_x() + rect.get_width()/2., 1.05*height,
            '%d' % int(height),
            ha='center', va='bottom')

autolabel(rects1)
plt.show()
```



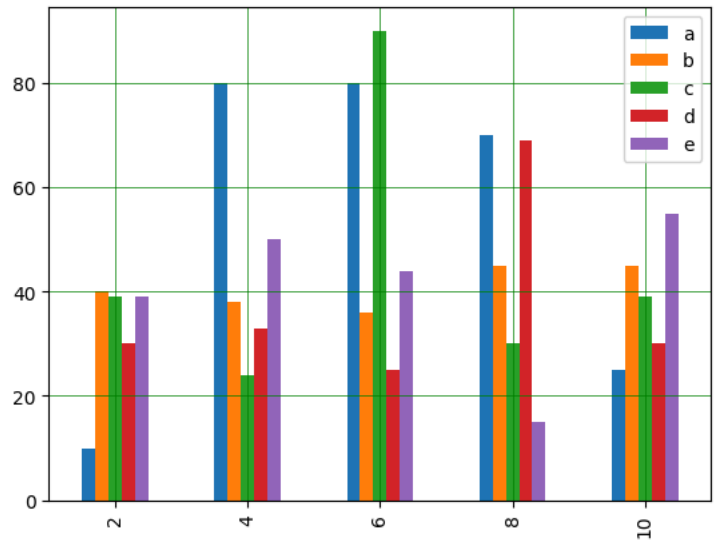

```
#task 11Write a Python programming to create a pie chart of the popularity of programming Languages


x =[ "Python", "Java", 'C', "C++", "R", "JavaScript", 'CSharp']
popularity = [100, 96.3, 94.4, 87.5, 81.5, 79.4, 74.5]

colors = ['blue', 'green', 'red', 'purple', 'orange', 'brown', 'cyan']

explode = (0.1,0,0,0,0,0,0)

plt.pie(popularity, explode = explode, labels = x, colors = colors, autopct = '%1.1f%%', shadow = True, startangle = 90)
plt.axis('equal')
plt.show()
```




```
# Task 12: Write a Python programming to create a pie chart with a title of the popularity of programming Languages. Make three

x =[ "Python", "Java", 'C', "C++", "R", "JavaScript", 'CSharp']
popularity = [100, 96.3, 94.4, 87.5, 81.5, 79.4, 74.5]

colors = ['blue', 'green', 'red', 'purple', 'orange', 'brown', 'cyan']

explode = (0.1,0.2,0.5,0,0,0,0)

plt.pie(popularity, explode = explode, labels = x, colors = colors, autopct = '%1.1f%%', shadow = True, startangle = 90)
plt.axis('equal')
plt.show()
```

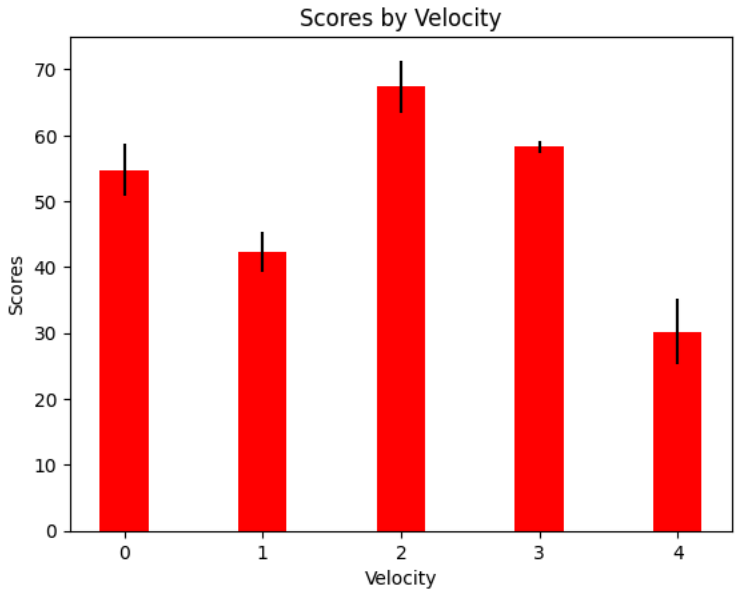



```
# #task 13
# Create bar plot from the following DataFrame:
# a b c d e
# 10,40,39,30,39
# 80,38,24,33,50
# 80,36,90,25,44
# 70,45,30,69,15
# 25,45,39,30,55

from pandas import DataFrame
import numpy as np
a = np.array([[10,40,39,30,39],[80,38,24,33,50],[80,36,90,25,44],[70,45,30,69,15],[25,45,39,30,55]])

df = DataFrame(a,columns = ['a','b','c','d','e'], index = [2,4,6,8,10])

df.plot(kind = 'bar')
plt.grid(which='major', linestyle='-', linewidth='0.5', color='green')
plt.grid(which='minor', linestyle=':', linewidth='0.5', color='black')
plt.show()
```

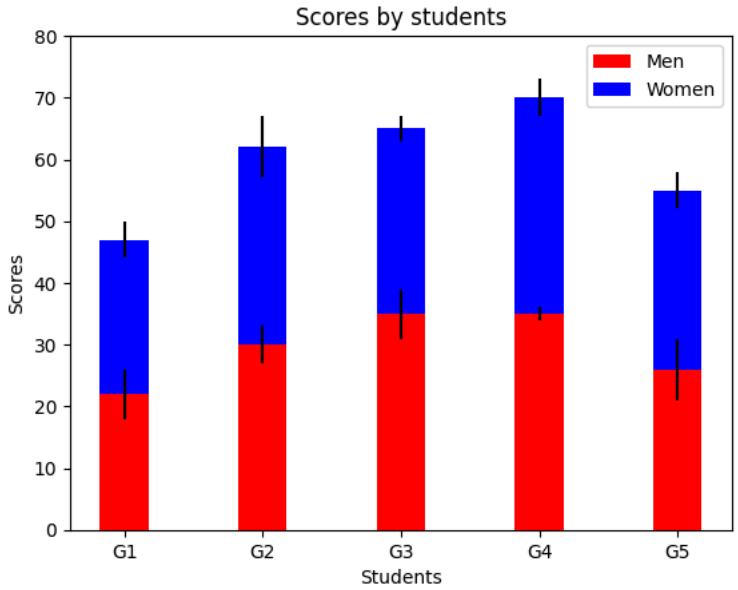



```
# # Task14 Write a Python program to create bar plots with error bars on the same figure.
# Sample Date
# Mean velocity: 0.2474, 0.1235, 0.1737, 0.1824
# Standard deviation of velocity: 0.3314, 0.2278, 0.2836, 0.2645

N = 5
menMeans = (54.74,42.35,67.37,58.24,30.25)
menStd = (4, 3, 4, 1, 5)

ind = np.arange(N)
width = 0.35
```

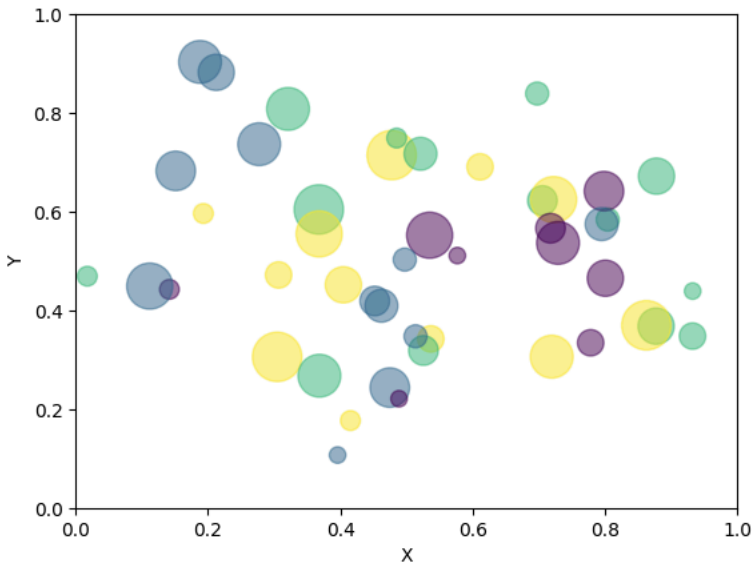
```
plt.bar(ind, menMeans, width, yerr=menStd, color ='red')
plt.ylabel('Scores')
plt.xlabel('Velocity')
plt.title('Scores by Velocity')

plt.show()
```




```
# Task 15: Write a Python program to create a stacked bar plot with error bars,
# Use bottom to stack the women's bars on top of the men's bars.
# Sample Data: Means (men) = (22, 30, 35, 35, 26) Means (women) = (25, 32, 30, 35, 29) Men Standard deviation = (4, 3, 4, 1, 5)

N = 5
menMeans = (22,30,35,35,26)
womenMeans = (25,32,30,35,29)
menStd = (4,3,4,1,5)
womenStd =(3,5,2,3,3)

ind = np.arange(N)
width = 0.35

p1 = plt.bar(ind,menMeans, width, yerr = menStd, color = 'red')
p2 = plt.bar(ind, womenMeans, width, bottom = menMeans, yerr = womenStd, color = 'blue')

plt.ylabel('Scores')
plt.xlabel('Students')
plt.title('Scores by students')
plt.xticks(ind, ('G1', 'G2', 'G3', 'G4', 'G5'))
plt.yticks(np.arange(0, 81, 10))
plt.legend((p1[0], p2[0]), ('Men', 'Women'))

plt.show()
```




```
# Task 17: Write a Python program to draw a scatter plot using random distributions to generate balls of different sizes.

import math
import random
import numpy as np
import matplotlib.pyplot as plt

noofballs = 50

x = [random.triangular() for i in range(noofballs)]
y = [random.gauss(0.5,0.25) for i in range(noofballs)]

colors = [random.randint(1,4) for i in range(noofballs)]
area = [math.pi*random.randint(5,15) ** 2 for i in range(noofballs)]

plt.scatter(x,y, s = area, c = colors, alpha = 0.5)
plt.axis([0.0,1.0,0.0,1.0])
plt.xlabel('X')
plt.ylabel('Y')
plt.show()
```




```
# Task 19: Write a Python program to draw a scatter plot comparing two subject marks of Java and Python.
# Test Data:
# java_marks = [88, 92, 80, 89, 100, 80, 60, 100, 80, 34]
# python_marks = [35, 79, 79, 48, 100, 88, 32, 45, 20, 30]
```

```
java_marks = [88, 92, 80, 89, 100, 80, 60, 100, 80, 34]
python_marks = [35, 79, 79, 48, 100, 88, 32, 45, 20, 30]
marks_range = [10,20,30,40,50,60,70,80,90,100]

plt.scatter(marks_range, python_marks, label ='Java Marks',color = 'pink')
plt.scatter(marks_range, java_marks, label = 'Python Marks', color = 'green')
plt.xlabel('Marks Range')
plt.ylabel('Marks Scored')
plt.title('Scatter Plot')
plt.legend()
plt.show()
```