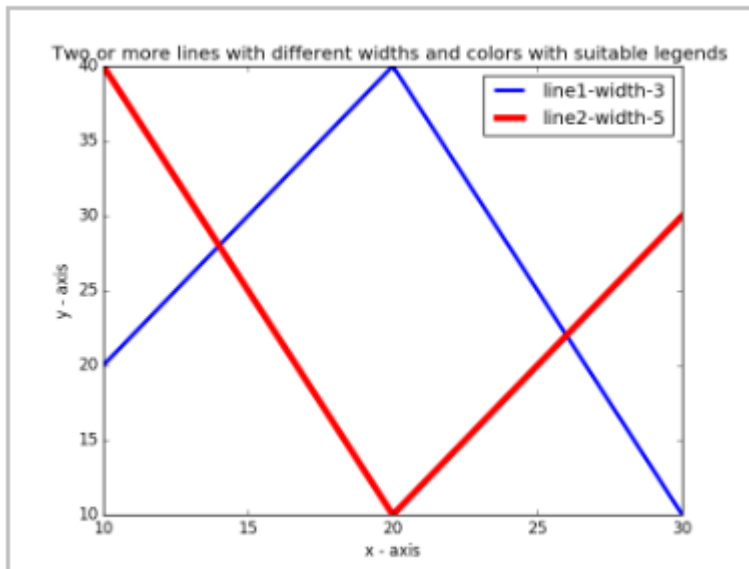25.Write a Python program to plot two or more lines with legends, different widths and colors.

INPUT:

import matplotlib.pyplot as plt

line 1 points

x1 = [10,20,30]

y1 = [20,40,10]

line 2 points

x2 = [10,20,30]

y2 = [40,10,30]

Set the x axis label of the current axis.

plt.xlabel('x - axis')

Set the y axis label of the current axis.

plt.ylabel('y - axis')

Set a title

plt.title('Two or more lines with different widths and colors with suitable legends ')
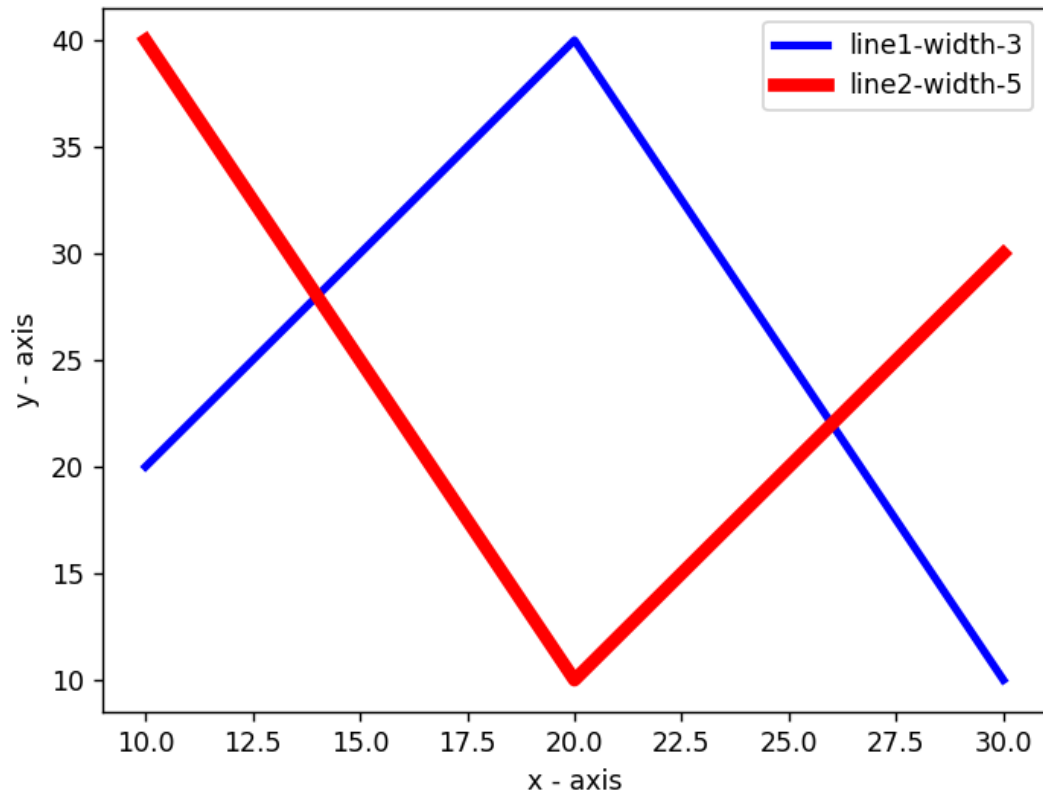
Display the figure.

plt.plot(x1,y1, color='blue', linewidth = 3, label = 'line1-width-3')

plt.plot(x2,y2, color='red', linewidth = 5, label = 'line2-width-5')

show a legend on the plot

plt.legend()

plt.show()

OUTPUT:

Two or more lines with different widths and colors with suitable legends

26.Write a Python program to create multiple plots.

INPUT:

```python
import matplotlib.pyplot as plt

fig = plt.figure()

fig.subplots_adjust(bottom=0.020, left=0.020, top = 0.900, right=0.800)

plt.subplot(2, 1, 1)

plt.xticks(()), plt.yticks(())

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()
```
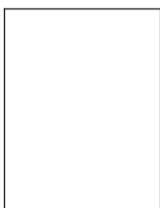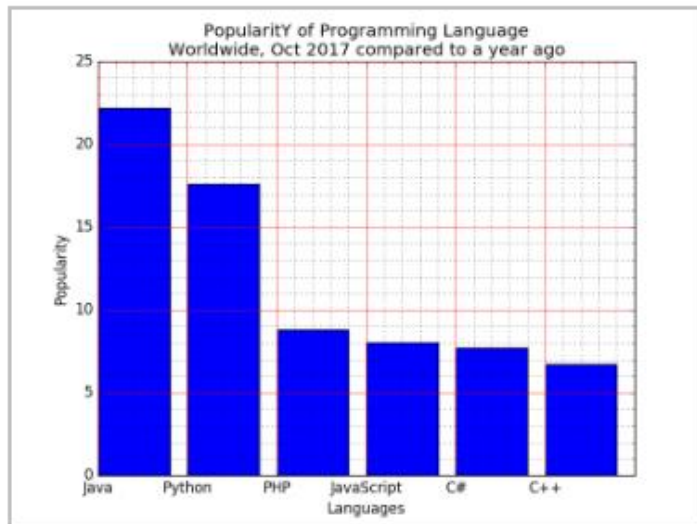
OUTPUT:

27.Write a Python programming to display a bar chart of the popularity of programming Languages.
Sample data:
Programming languages: Java, Python, PHP, JavaScript, C#, C++
Popularity: 22.2, 17.6, 8.8, 8, 7.7, 6.7

INPUT:

```
import matplotlib.pyplot as plt

x = ['Java', 'Python', 'PHP', 'JavaScript', 'C#', 'C++']

popularity = [22.2, 17.6, 8.8, 8, 7.7, 6.7]

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

plt.bar(x_pos, popularity, color='blue')

plt.xlabel("Languages")

plt.ylabel("Popularity")

plt.title("PopularitY of Programming Language\n" + "Worldwide, Oct 2017 compared to a year ago")

plt.xticks(x_pos, x)

# Turn on the grid

plt.minorticks_on()
```
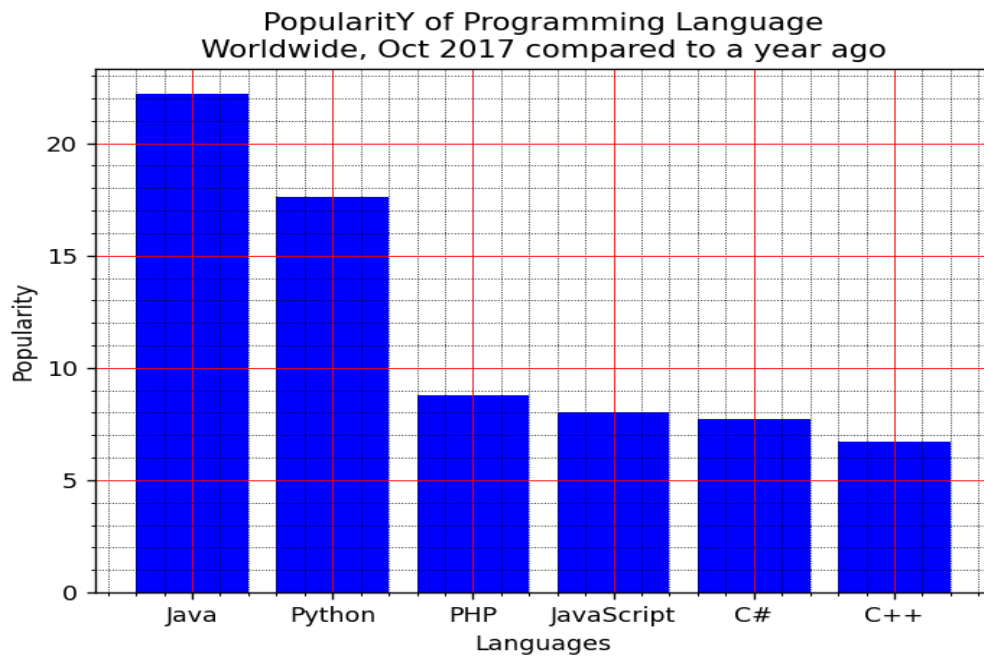
plt.grid(which='major', linestyle='-', linewidth='0.5', color='red')

Customize the minor grid

plt.grid(which='minor', linestyle=':', linewidth='0.5', color='black')
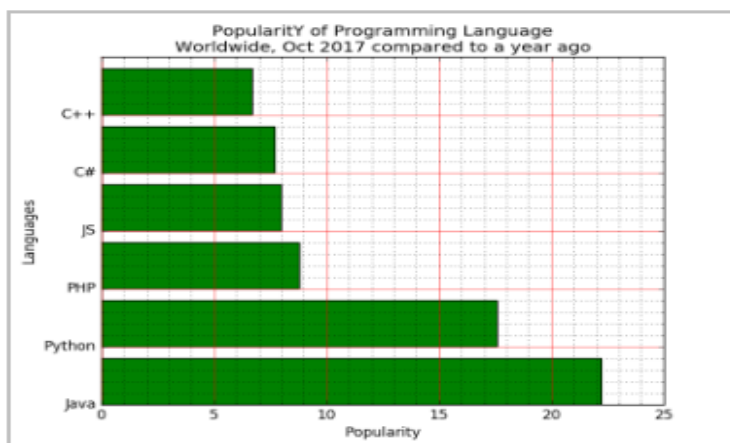
plt.show()

OUTPUT:

28.Write a Python programming to display a horizontal bar chart of the popularity of programming Languages.
Sample data:
Programming languages: Java, Python, PHP, JavaScript, C#, C++
Popularity: 22.2, 17.6, 8.8, 8, 7.7, 6.7

INPUT:

```python
import matplotlib.pyplot as plt

x = ['Java', 'Python', 'PHP', 'JS', 'C#', 'C++']

popularity = [22.2, 17.6, 8.8, 8, 7.7, 6.7]

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

plt.barh(x_pos, popularity, color='green')

plt.xlabel("Popularity")

plt.ylabel("Languages")

plt.title("PopularitY of Programming Language\n" + "Worldwide, Oct 2017 compared to a year ago")

plt.yticks(x_pos, x)

# Turn on the grid

plt.minorticks_on()

plt.grid(which='major', linestyle='-', linewidth='0.5', color='red')

# Customize the minor grid

plt.grid(which='minor', linestyle=':', linewidth='0.5', color='black')

plt.show()
```
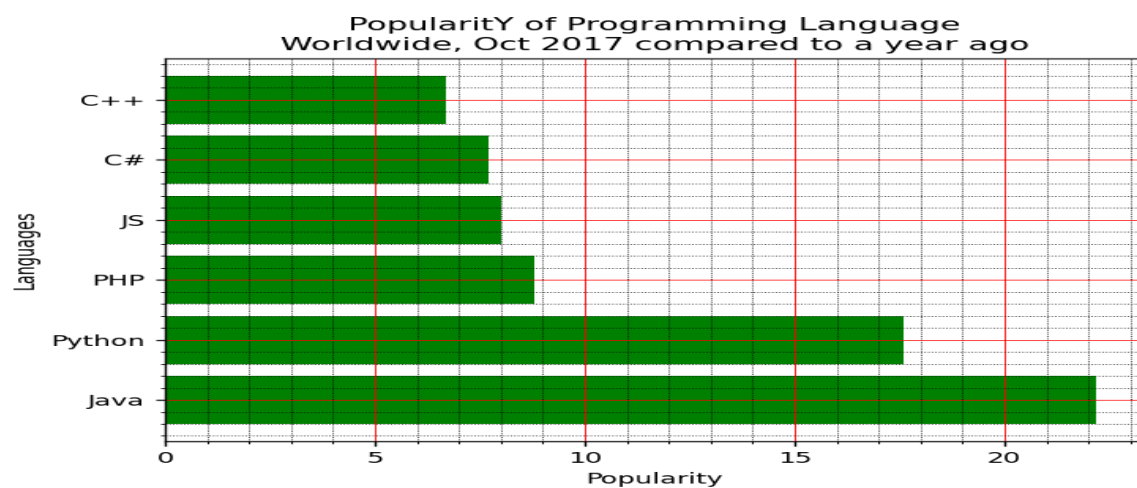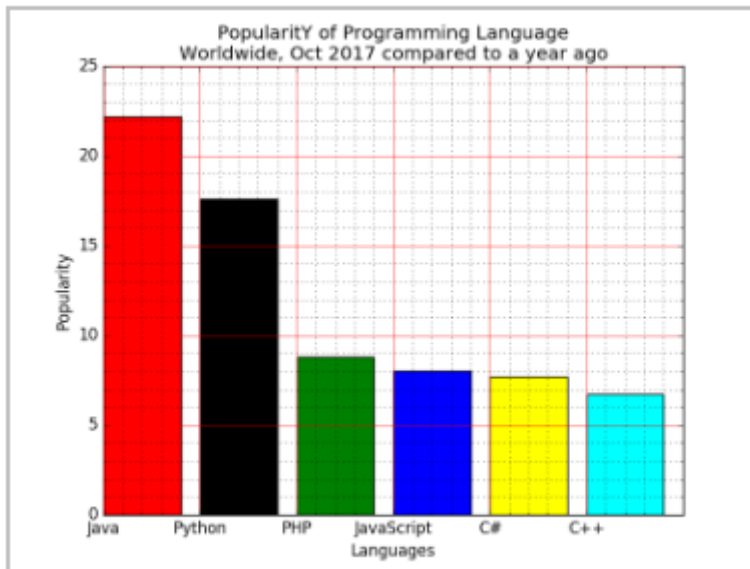
OUTPUT:

29.Write a Python programming to display a bar chart of the popularity of programming Languages. Use different color for each bar.
Sample data:
Programming languages: Java, Python, PHP, JavaScript, C#, C++
Popularity: 22.2, 17.6, 8.8, 8, 7.7, 6.7

INPUT:

```
import matplotlib.pyplot as plt

x = ['Java', 'Python', 'PHP', 'JavaScript', 'C#', 'C++']

popularity = [22.2, 17.6, 8.8, 8, 7.7, 6.7]

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

plt.bar(x_pos, popularity, color=['red', 'black', 'green', 'blue', 'yellow', 'cyan'])

plt.xlabel("Languages")

plt.ylabel("Popularity")

plt.title("PopularitY of Programming Language\n" + "Worldwide, Oct 2017 compared to a year ago")

plt.xticks(x_pos, x)

# Turn on the grid

plt.minorticks_on()
```
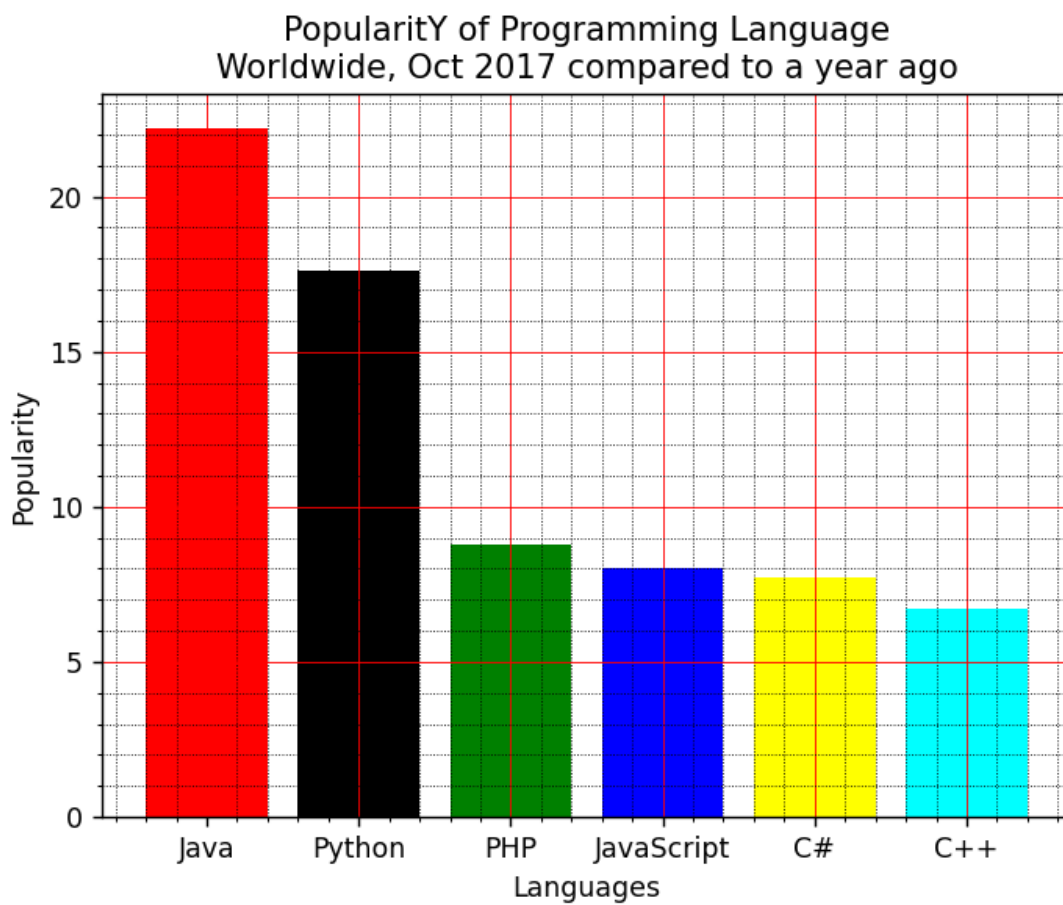
plt.grid(which='major', linestyle='-', linewidth='0.5', color='red')

Customize the minor grid

plt.grid(which='minor', linestyle=':', linewidth='0.5', color='black')
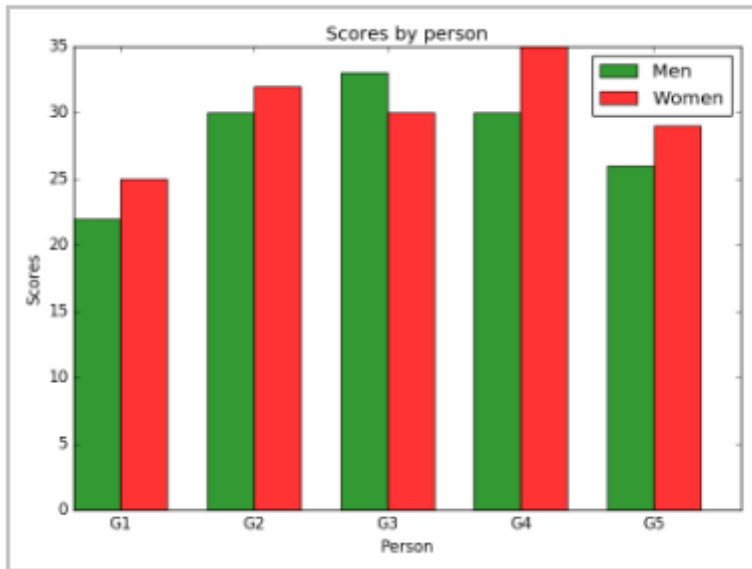
plt.show()

OUTPUT:

30.Write a Python program to create bar plot of scores by group and gender.
Use multiple X values on the same chart for men and women.
Sample Data:
Means (men) = (22, 30, 35, 35, 26)
Means (women) = (25, 32, 30, 35, 29)

Scores by person

INPUT:

```
import numpy as np

import matplotlib.pyplot as plt

# data to plot

n_groups = 5

men_means = (22, 30, 33, 30, 26)

women_means = (25, 32, 30, 35, 29)

# create plot

fig, ax = plt.subplots()

index = np.arange(n_groups)

bar_width = 0.35

opacity = 0.8

rects1 = plt.bar(index, men_means, bar_width,

alpha=opacity,

color='g',
```

```
                              label='Men')

rects2 = plt.bar(index + bar_width, women_means, bar_width,

                 alpha=opacity,

                 color='r',

                 label='Women')

plt.xlabel('Person')

plt.ylabel('Scores')

plt.title('Scores by person')

plt.xticks(index + bar_width, ('G1', 'G2', 'G3', 'G4', 'G5'))

plt.legend()

plt.tight_layout()

plt.show()
```
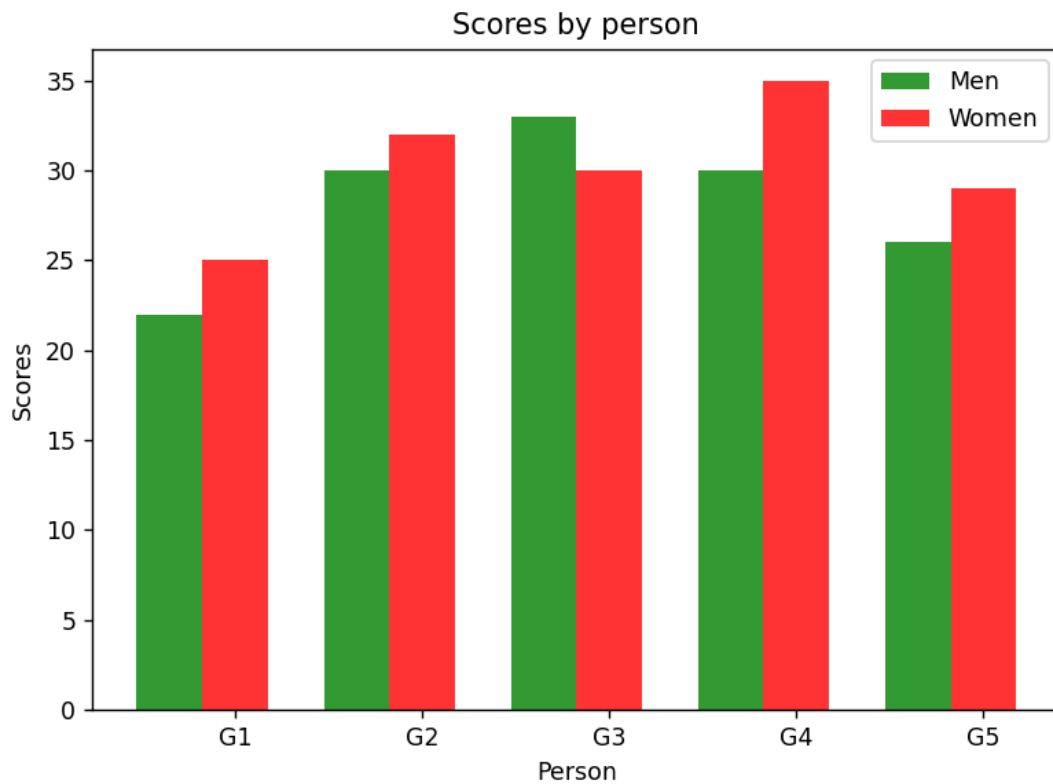
OUTPUT:

31.Write a Python program to create a stacked bar plot with error bars.
Note: Use bottom to stack the women?s bars on top of the men?s bars.
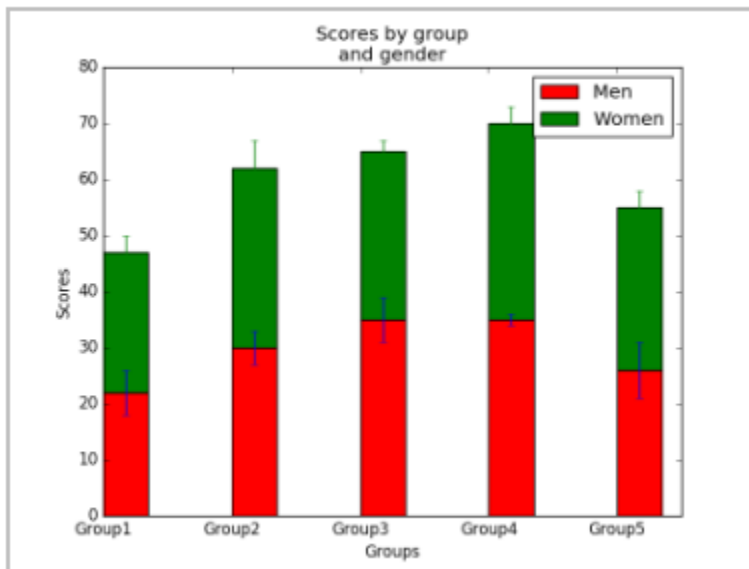Sample Data:
Means (men) = (22, 30, 35, 35, 26)
Means (women) = (25, 32, 30, 35, 29)
Men Standard deviation = (4, 3, 4, 1, 5)
Women Standard deviation = (3, 5, 2, 3, 3)

INPUT:

import numpy as np

import matplotlib.pyplot as plt

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)

the x locations for the groups

ind = np.arange(N)

```
# the width of the bars

width = 0.35

p1 = plt.bar(ind, menMeans, width, yerr=menStd, color='red')

p2 = plt.bar(ind, womenMeans, width,

bottom=menMeans, yerr=womenStd, color='green')

plt.ylabel('Scores')

plt.xlabel('Groups')

plt.title('Scores by group\n' + 'and gender')

plt.xticks(ind, ('Group1', 'Group2', 'Group3', 'Group4', 'Group5'))

plt.yticks(np.arange(0, 81, 10))

plt.legend((p1[0], p2[0]), ('Men', 'Women'))

plt.show()
```
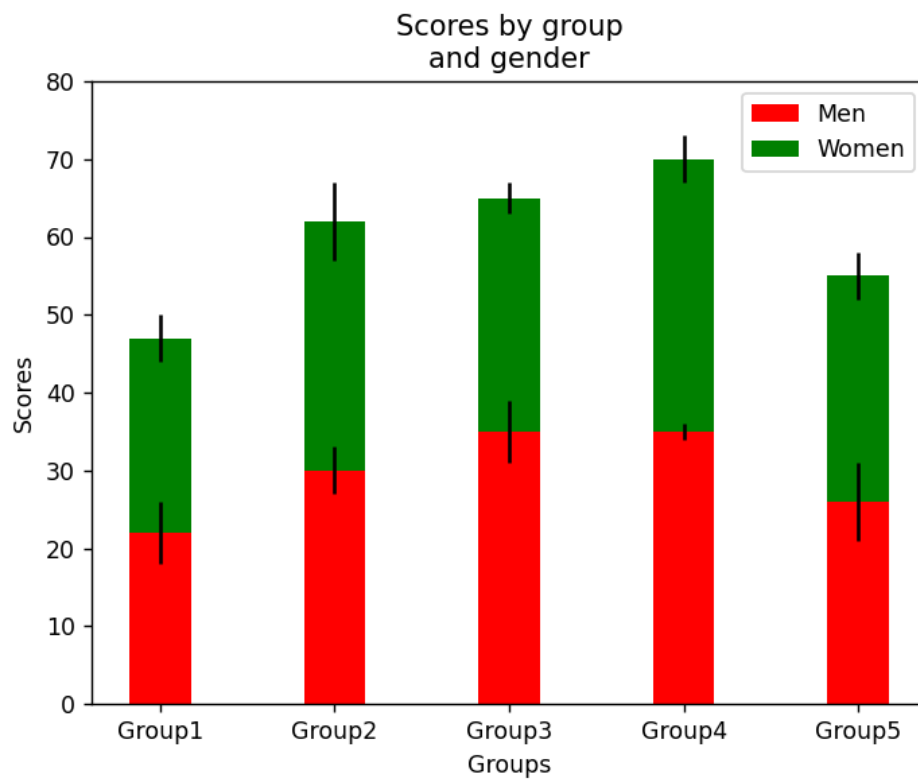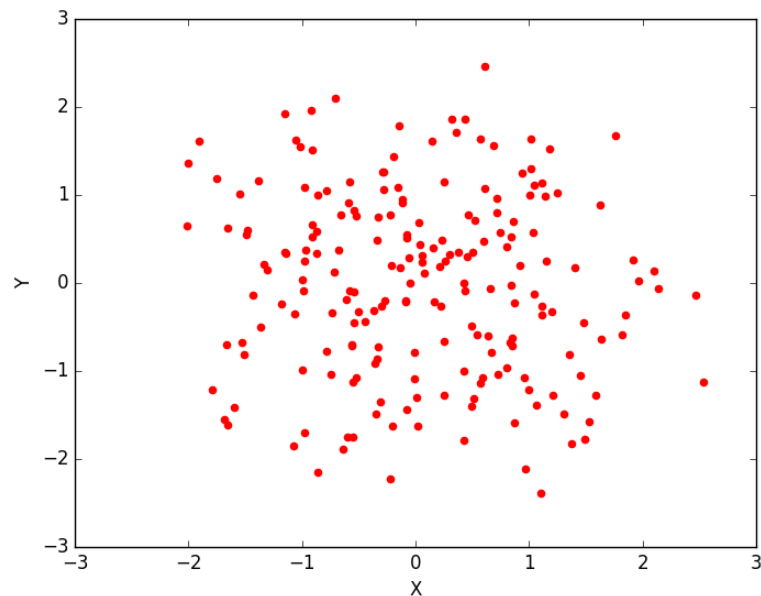
OUTPUT:

32.Write a Python program to draw a scatter graph taking a random distribution in X and Y and plotted against each other.

INPUT:

import numpy as np

import matplotlib.pyplot as plt

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)

the x locations for the groups

ind = np.arange(N)

the width of the bars

width = 0.35

p1 = plt.bar(ind, menMeans, width, yerr=menStd, color='red')

```
p2 = plt.bar(ind, womenMeans, width,

bottom=menMeans, yerr=womenStd, color='green')

plt.ylabel('Scores')

plt.xlabel('Groups')

plt.title('Scores by group\n' + 'and gender')

plt.xticks(ind, ('Group1', 'Group2', 'Group3', 'Group4', 'Group5'))

plt.yticks(np.arange(0, 81, 10))

plt.legend((p1[0], p2[0]), ('Men', 'Women'))

plt.show()
```

OUTPUT: