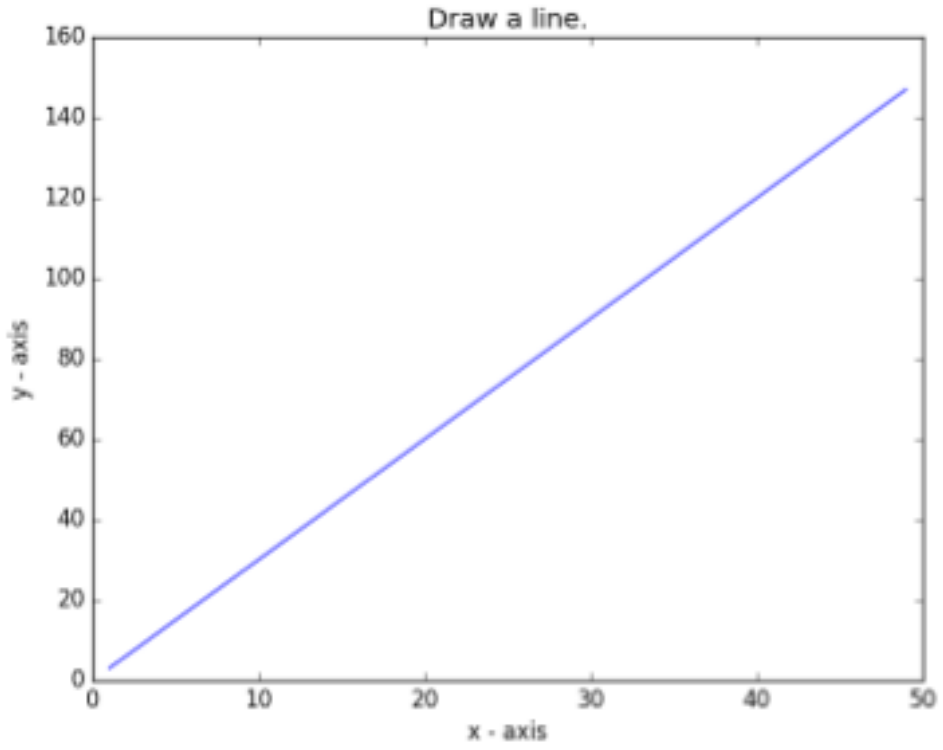
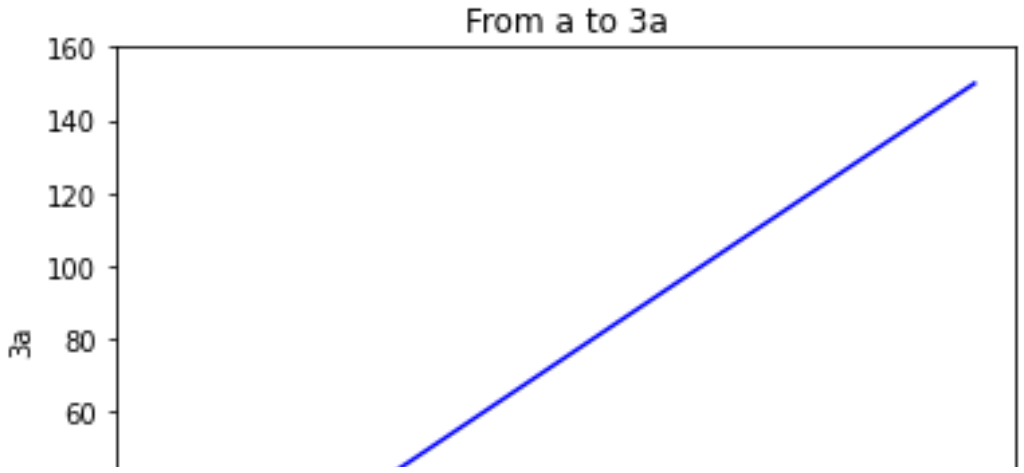
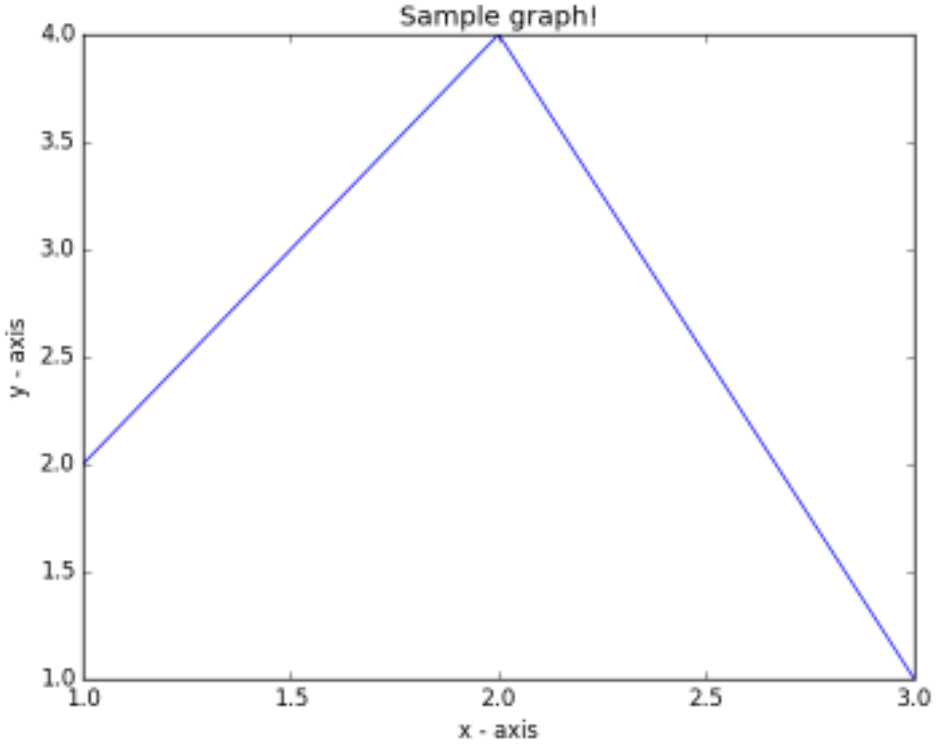
Draw a line as shown below (value in y axis are thrice the value in x-axis ). Add a suitable label in the x axis, y axis and a title.




```
import matplotlib.pyplot as plt
x=[0,10,20,30,40,50]
y=[3*i for i in x]

plt.plot(x,y,'b')
plt.ylim(0,160)
plt.xlabel('a')
plt.ylabel('3a')
plt.title('From a to 3a')
plt.show()
```

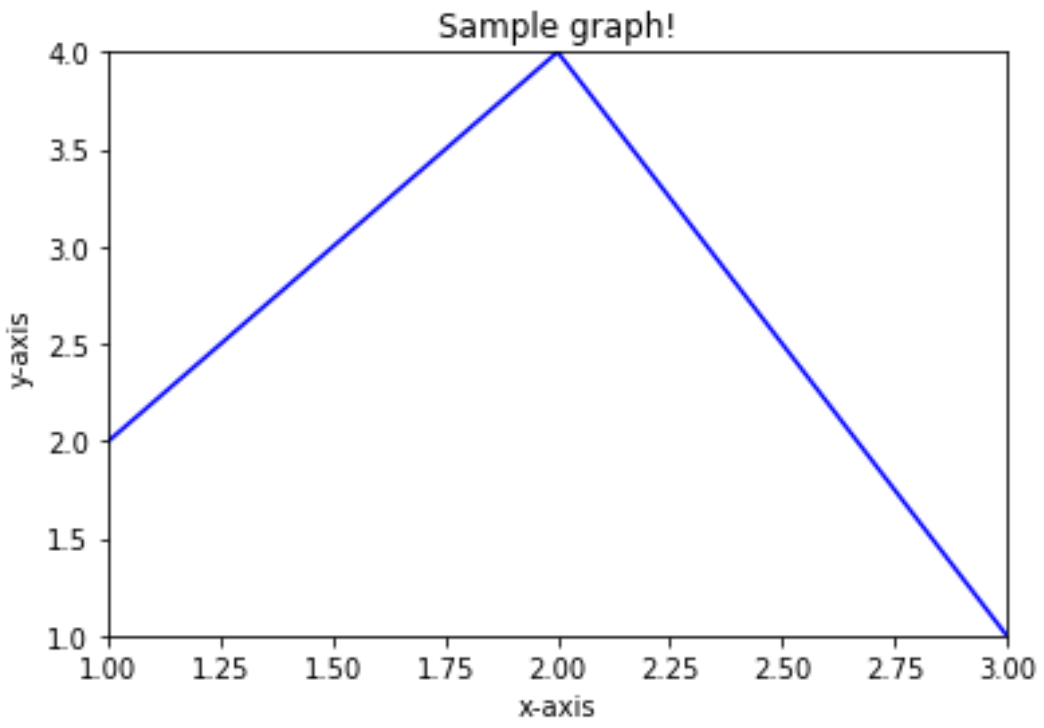



Write a Python program to draw following output-




```
import matplotlib.pyplot as plt
x=[1,2,3]
y=[2,4,1]

plt.plot(x,y,'b')
plt.axis([1,3,1,4])
plt.xlabel('x-axis')
plt.ylabel('y-axis')
plt.title('Sample graph!')
```

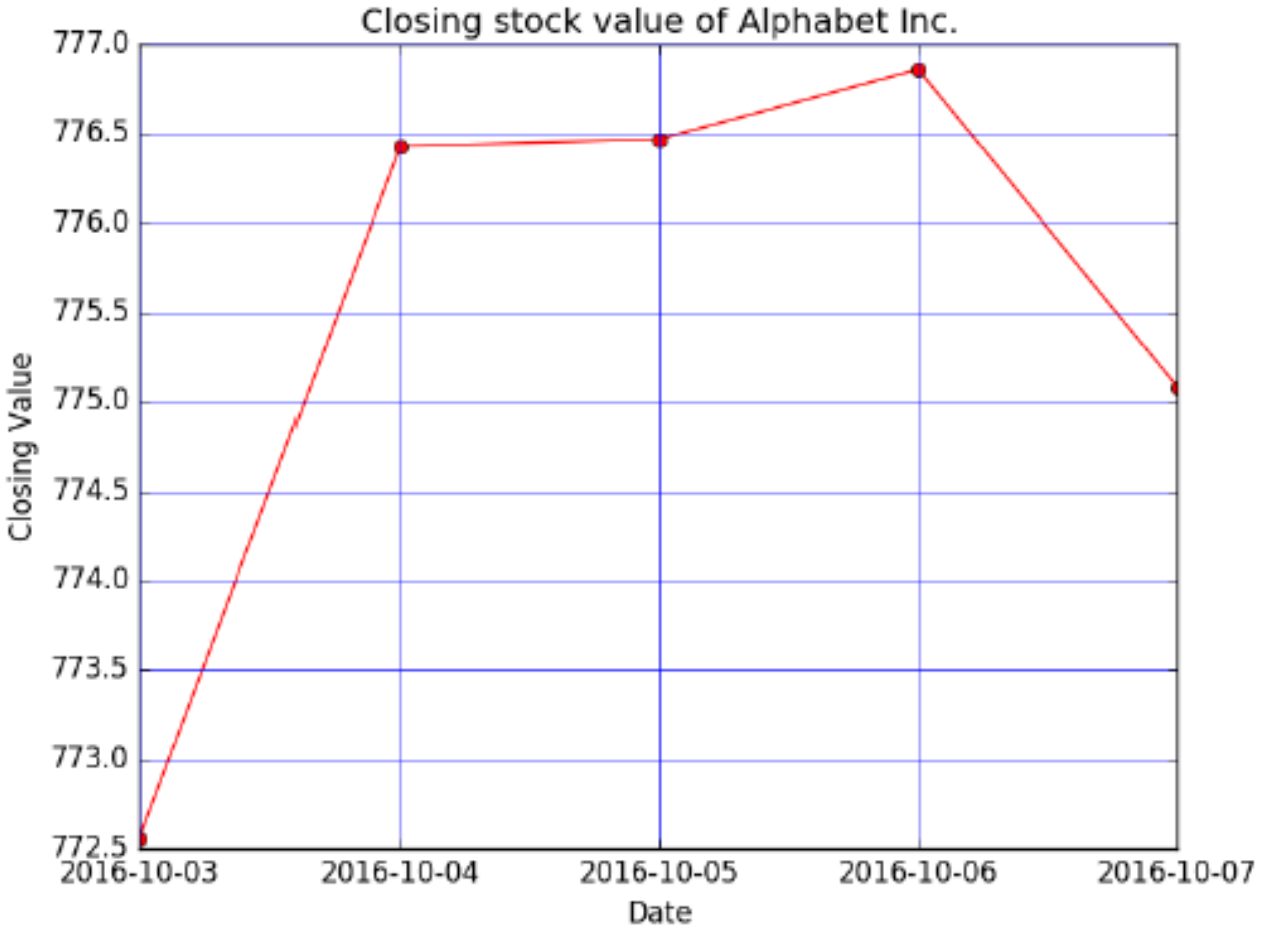
```
plt.show()
```



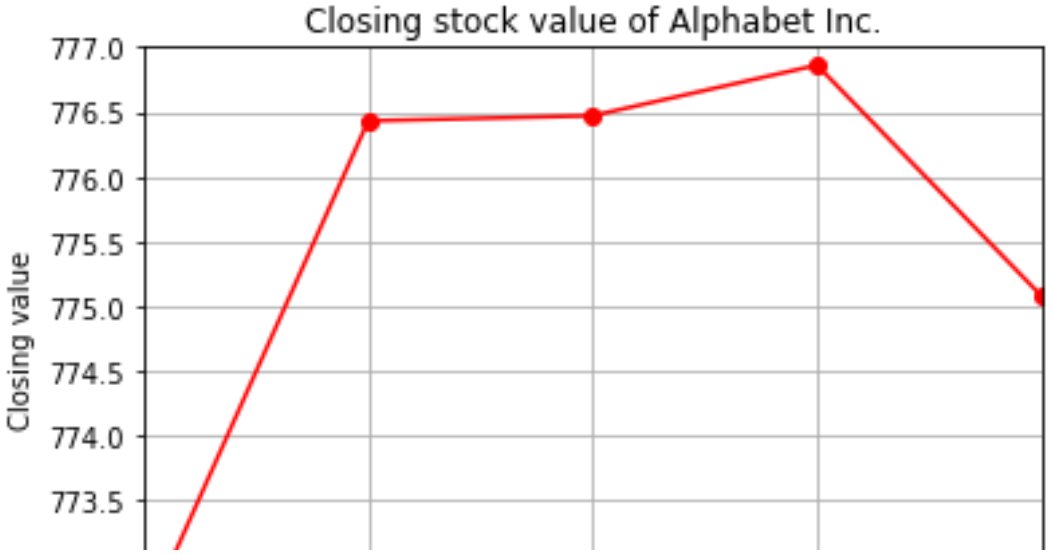

Write a Python program to display the grid and draw line charts of the closing value of ABC Ltd. between October 3, 2019 to October 7, 2019. Customized the grid lines with linestyle -, width .5. and color blue.

```
Date     ,         Close

03-10-16 ,         772.559998

04-10-16 ,         776.429993

05-10-16 ,         776.469971

06-10-16 ,         776.859985

07-10-16 ,         775.080017
```

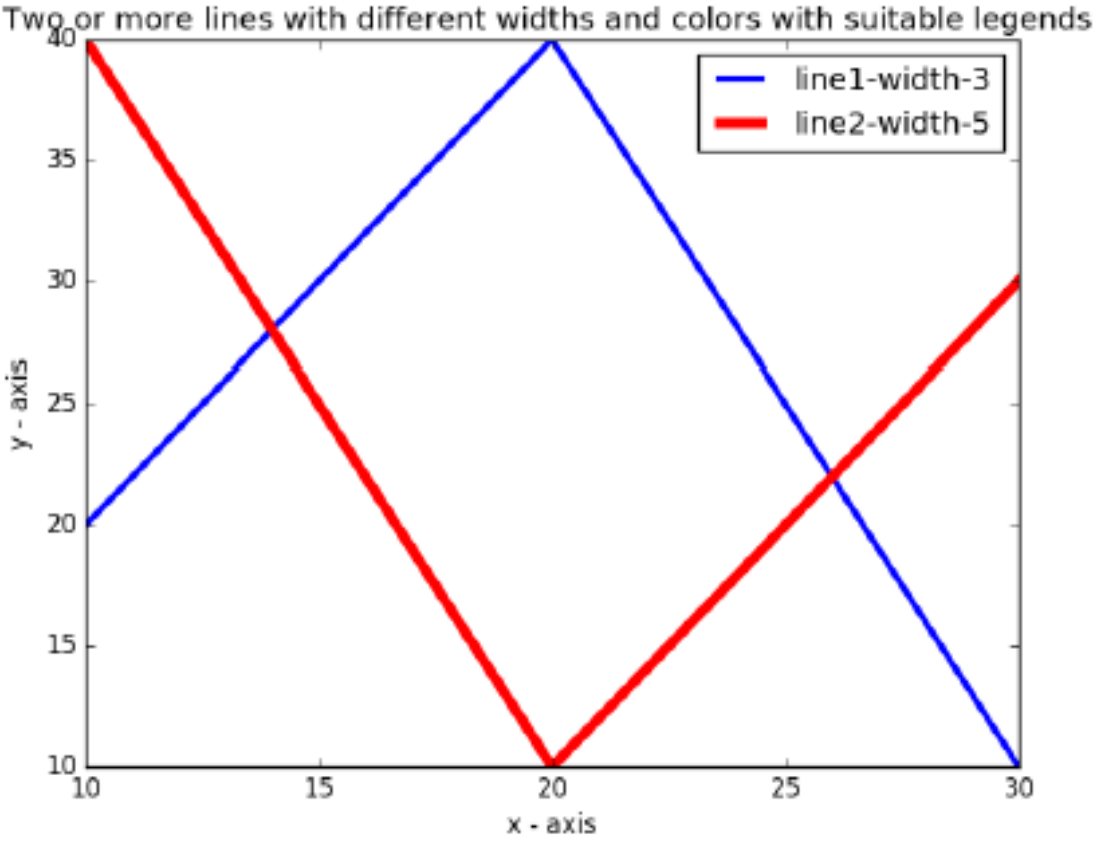
The code snippet gives the output shown in the following screenshot:




```
import matplotlib.pyplot as plt
x=['03-10-16','04-10-16','05-10-16','06-10-16','07-10-16']
y=[772.559998,776.429993,776.469971,776.859985,775.080017]

plt.plot(x,y,'ro-')
plt.axis([x[0],x[len(x)-1],772.5,777])
plt.xlabel('Date')
plt.ylabel('Closing value')
plt.title('Closing stock value of Alphabet Inc.')
plt.grid()
plt.show()
```

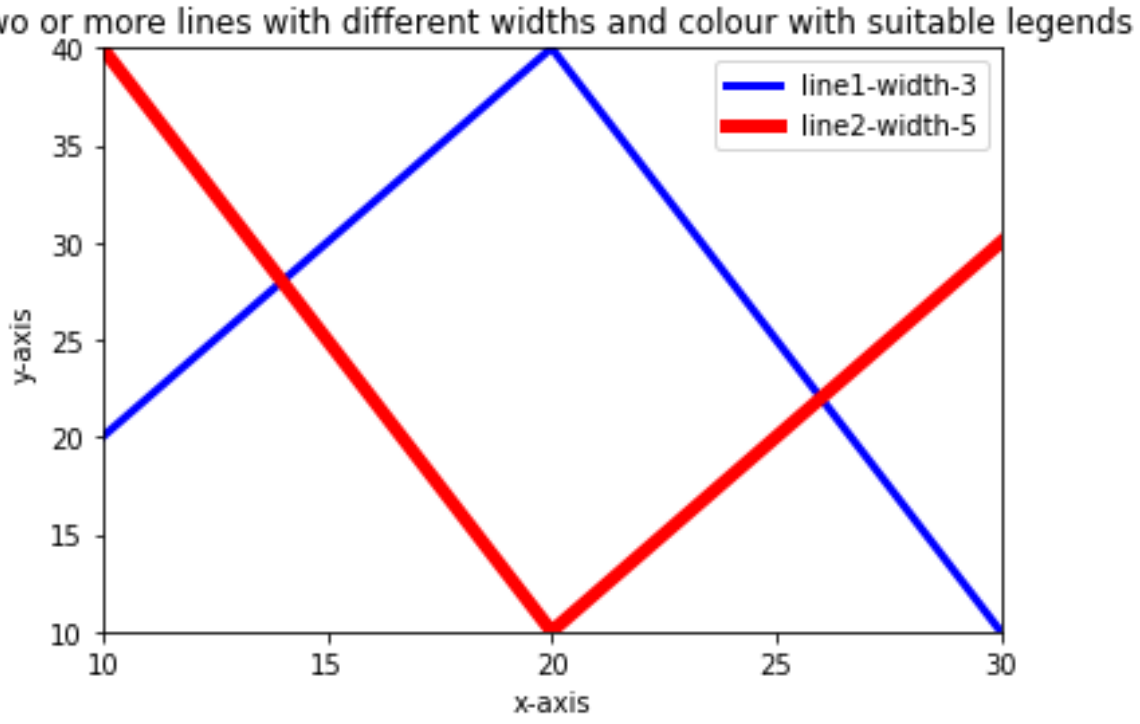



Plot two lines as shown below with appropriate legends, different widths and colors.




```
import matplotlib.pyplot as plt
x=[10,20,30]
y=[20,40,10]
plt.plot(x,y,'b', label='line1-width-3',  linewidth=3)
```

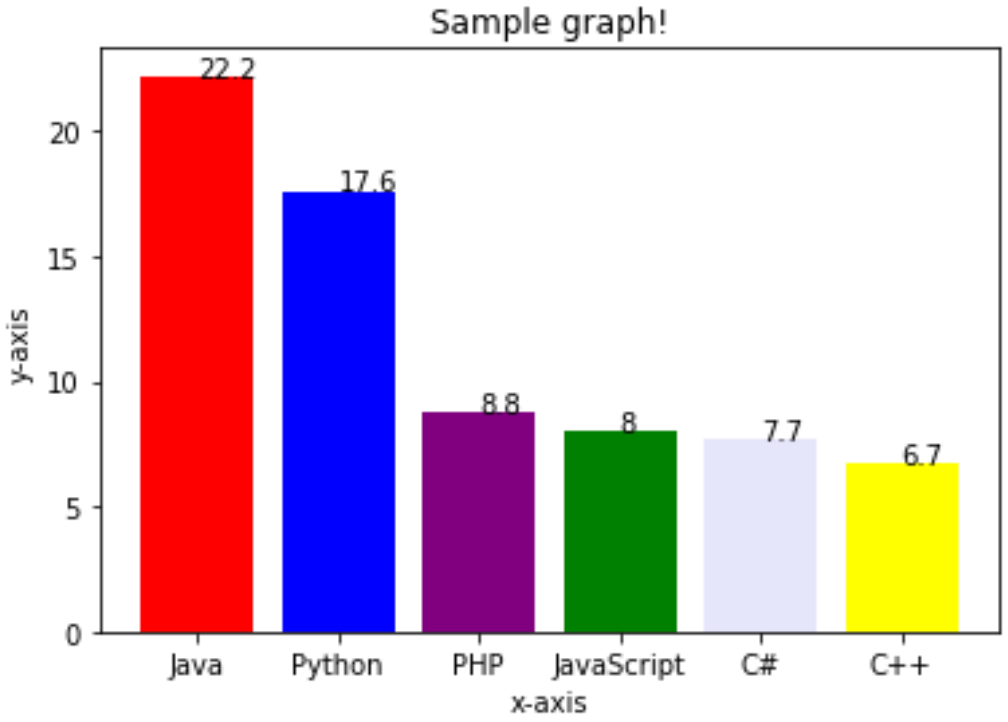
```
y=[40,10,30]
plt.plot(x,y,'r', label='line2-width-5',  linewidth=5)
plt.axis([10,30,10,40])
plt.legend()
plt.xlabel('x-axis')
plt.xticks([10,15,20,25,30])
plt.ylabel('y-axis')
plt.title('Two or more lines with different widths and colour with su
plt.show()
```




Display a bar chart of the popularity of programming Languages. Attach a text label above each bar displaying its popularity (float value). Use different color for each bar. Make blue border to each bar. Sample data:
Programming languages: Java, Python, PHP, JavaScript, C#, C++
Popularity: 22.2, 17.6, 8.8, 8, 7.7, 6.7

```
import matplotlib.pyplot as plt
x=['Java', 'Python', 'PHP', 'JavaScript', 'C#', 'C++']
y=[22.2, 17.6, 8.8, 8, 7.7, 6.7]
```

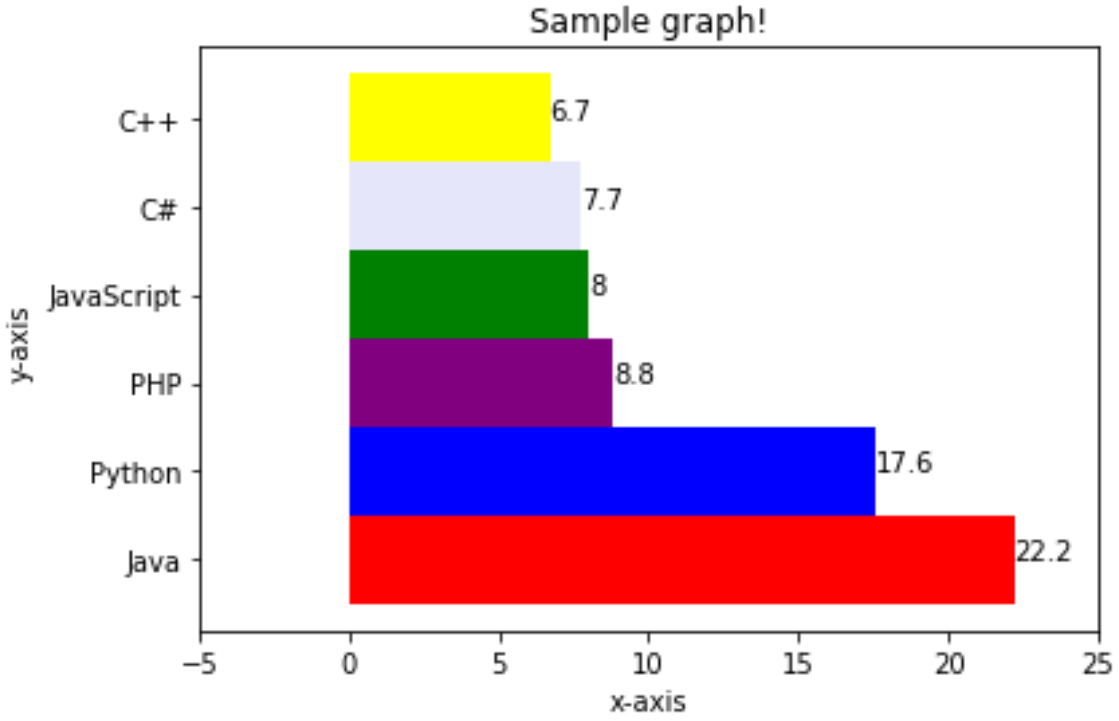
```
plt.bar(x,y,color=['red', 'blue', 'purple', 'green', 'lavender','yell
for i in range(0,len(x)):
  plt.text(i,y[i],y[i])
plt.xlabel('x-axis')
plt.ylabel('y-axis')
plt.title('Sample graph!')
plt.show()
```




Convert bar chart of Q5 into horizontal bar chart and increase its bottom margin.

```
import matplotlib.pyplot as plt
x=['Java', 'Python', 'PHP', 'JavaScript', 'C#', 'C++']
y=[22.2, 17.6, 8.8, 8, 7.7, 6.7]

plt.barh(x,y,1,color=['red', 'blue', 'purple', 'green', 'lavender','y
for i in range(0,len(x)):
  plt.text(y[i],i,y[i])
plt.xlim(-5,25)
plt.xlabel('x-axis')
plt.ylabel('y-axis')
```

```
plt.title('Sample graph!')
plt.show()
```

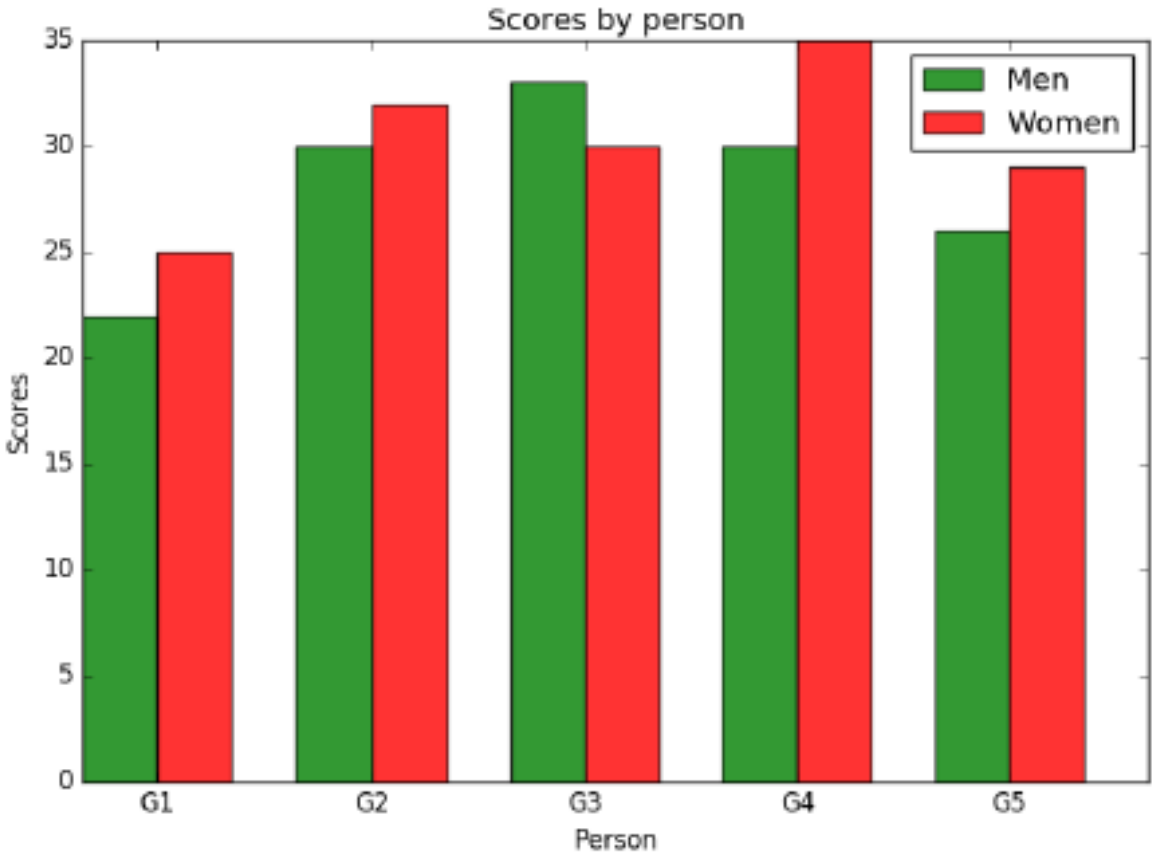



Create bar plot of scores by group and gender. Use multiple X values on the same chart for men and women.

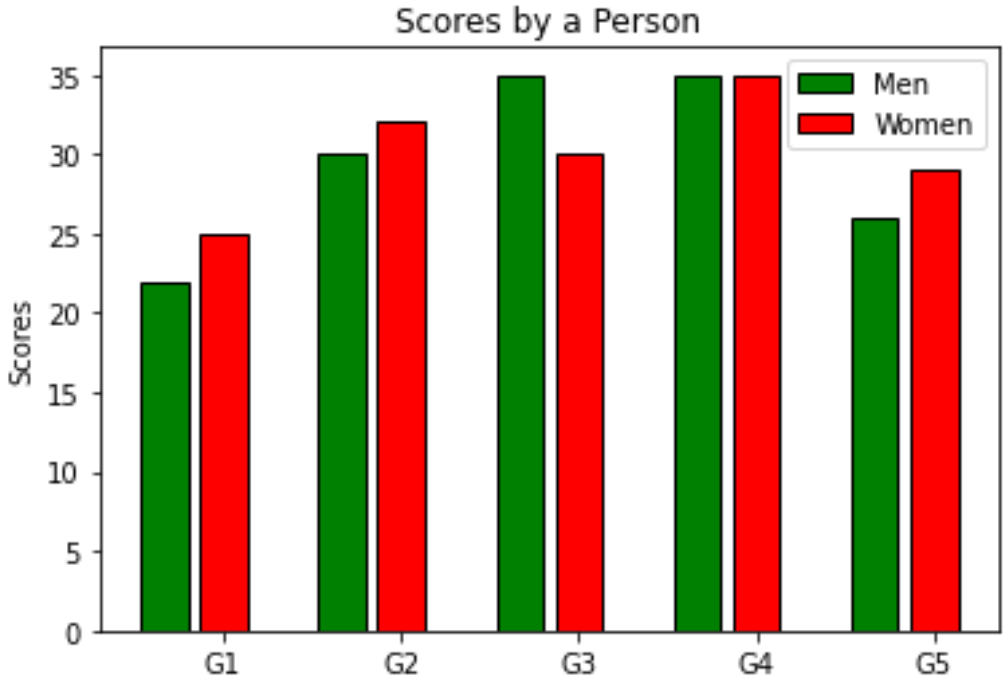
Means (men) = (22, 30, 35, 35, 26)

Means (women) = (25, 32, 30, 35, 29)

Output should be as follows:



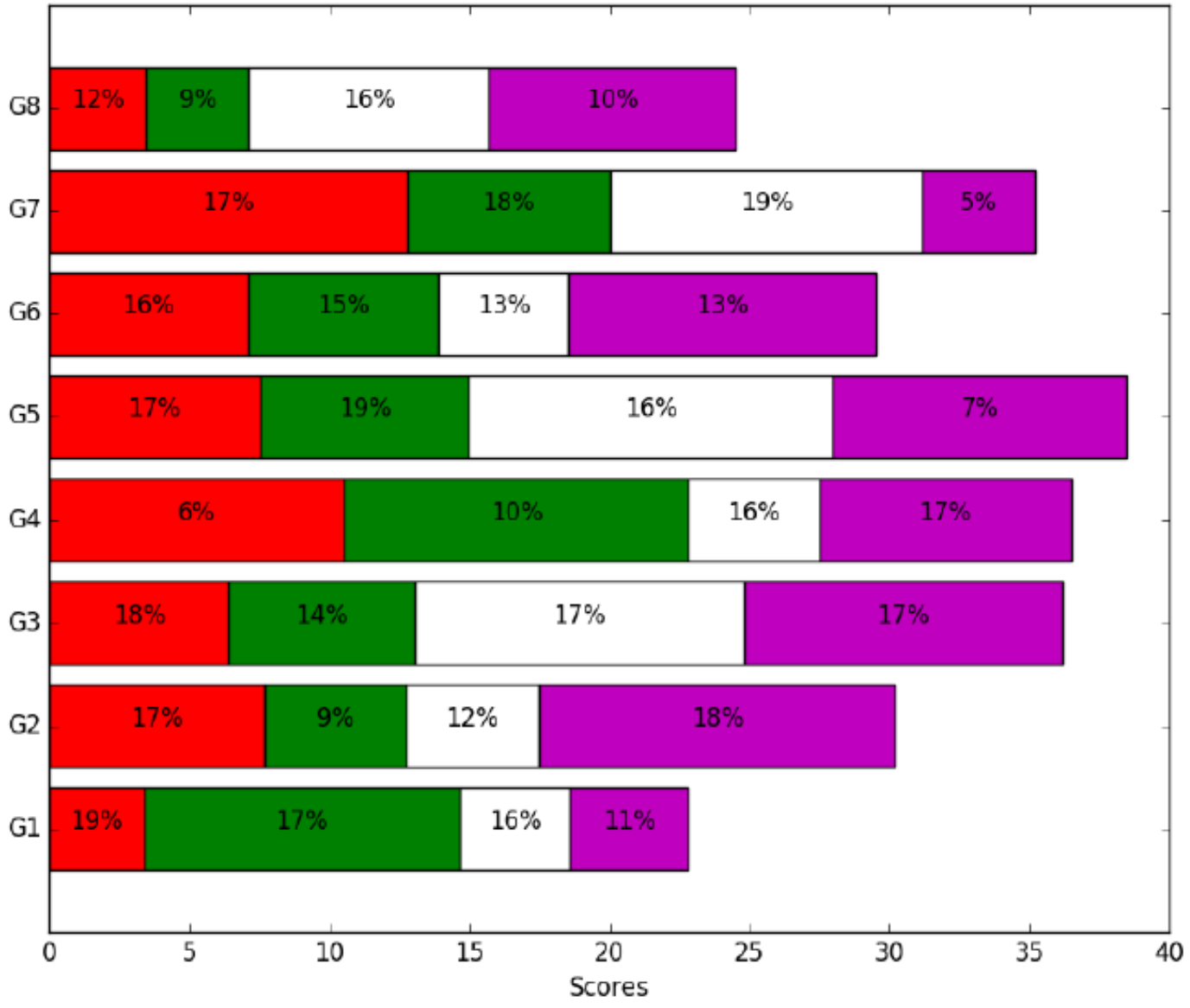

```
import matplotlib.pyplot as plt

x1=[1,4,7,10,13]
x2=[2,5,8,11,14]
y1=[22, 30, 35, 35, 26]
y2=[25, 32, 30, 35, 29]

plt.bar(x1, y1, color = 'g', label='Men',ec='k')
plt.bar(x2, y2, color = 'r', label='Women',ec='k')
plt.xticks([2,5,8,11,14], ('G1', 'G2', 'G3', 'G4', 'G5'))
plt.legend()
plt.xlabel('Person')
plt.ylabel('Scores')
plt.title('Scores by a Person')
plt.show()
```




Write a Python program to create stack bar plot and add label to each section. Sample data: people = ('G1','G2','G3','G4','G5','G6','G7','G8') segments = 4

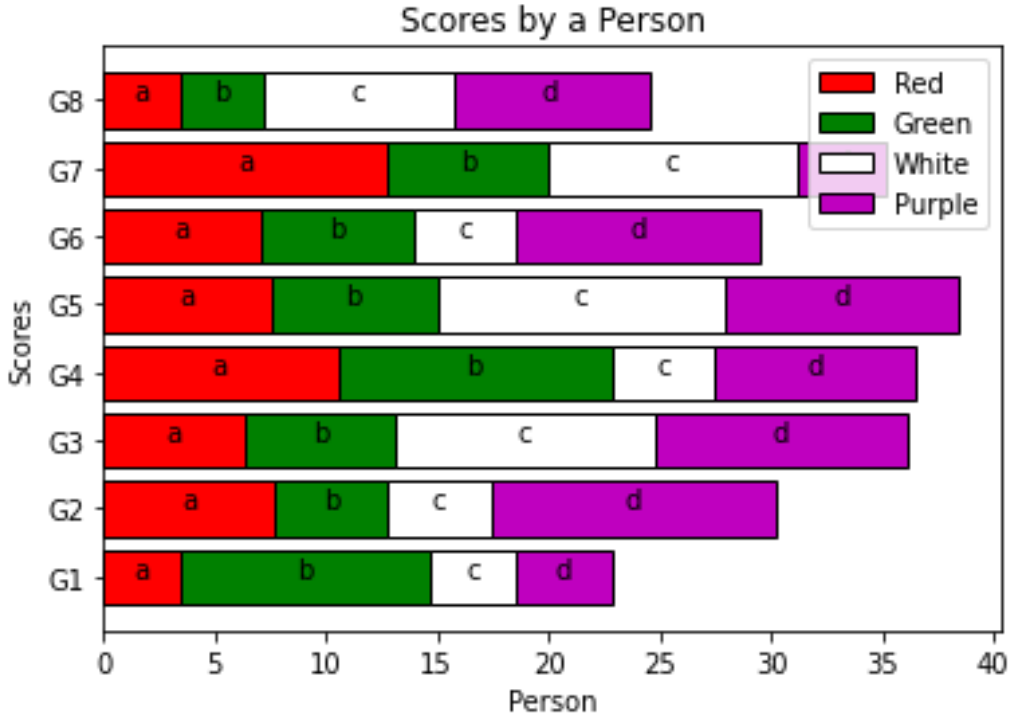
# multi-dimensional data

data = [[ 3.40022085, 7.70632498, 6.4097905, 10.51648577, 7.5330039, 7.1123587, 12.77792868, 3.44773477], [ 11.24811149, 5.03778215, 6.65808464, 12.32220677, 7.45964195, 6.79685302, 7.24578743, 3.69371847], [ 3.94253354, 4.74763549, 11.73529246, 4.6465543, 12.9952182, 4.63832778, 11.16849999, 8.56883433], [ 4.24409799, 12.71746612, 11.3772169, 9.00514257, 10.47084185, 10.97567589, 3.98287652, 8.80552122]]



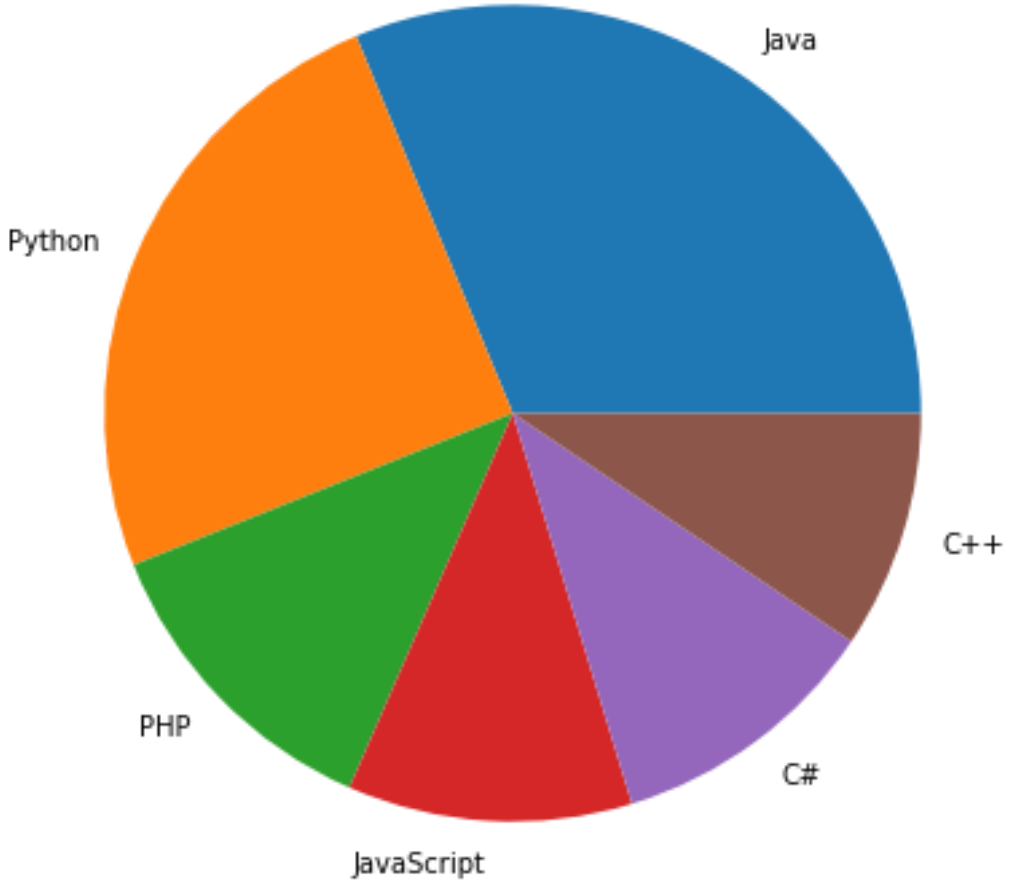

```
import matplotlib.pyplot as plt

x=['G1', 'G2', 'G3', 'G4', 'G5', 'G6', 'G7', 'G8']
y=[[ 3.40022085, 7.70632498, 6.4097905, 10.51648577, 7.5330039, 7.112
[ 11.24811149, 5.03778215, 6.65808464, 12.32220677, 7.45964195, 6.796
[ 3.94253354, 4.74763549, 11.73529246, 4.6465543, 12.9952182, 4.63832
[ 4.24409799, 12.71746612, 11.3772169, 9.00514257, 10.47084185, 10.97

plt.barh(x, y[0], color = 'r',  label='Red',ec='k')
for i in range(0,len(y[1])):
  plt.text(y[0][i]/2,i,'a',ha='center')
```

```
plt.barh(x, y[1], color = 'g',  label='Green',  left = y[0],ec='k')
for i in range(0,len(y[1])):
  plt.text(y[0][i]+y[1][i]/2,i,'b',ha='center')

plt.barh(x, y[2], color = 'w',  label='White',  left = [y[0][i]+y[1][
for i in range(0,len(y[1])):
  plt.text(y[0][i]+y[1][i]+y[2][i]/2,i,'c',ha='center')

plt.barh(x, y[3], color = 'm',  label='Purple',  left = [y[0][i]+y[1]
for i in range(0,len(y[1])):
  plt.text(y[0][i]+y[1][i]+y[2][i]+y[3][i]/2,i,'d',ha='center')
plt.legend()

plt.xlabel('Person')
plt.ylabel('Scores')
plt.title('Scores by a Person')
plt.show()
```




Create a pie chart of the popularity of programming Languages. Add a title to this pie chart. Use sample data given in Q5.

```
import matplotlib.pyplot as plt

x=['Java', 'Python', 'PHP', 'JavaScript', 'C#', 'C++']
y=[22.2, 17.6, 8.8, 8, 7.7, 6.7]

fig = plt.figure(figsize =(10, 7))
plt.pie(y, labels = x)

plt.show()
```




Create a pie chart of gold medal achievements of five most successful countries in 2016 Summer Olympics. Read the data from a csv file.

Sample data:

medal.csv

country,gold_medal

United States,46

Great Britain,27

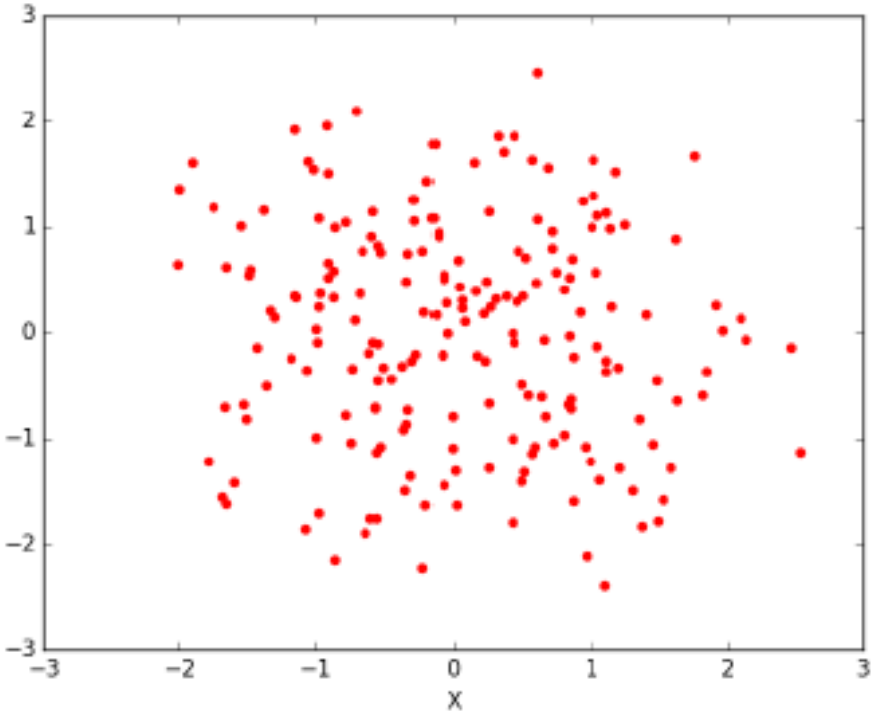
China,26

Russia,19

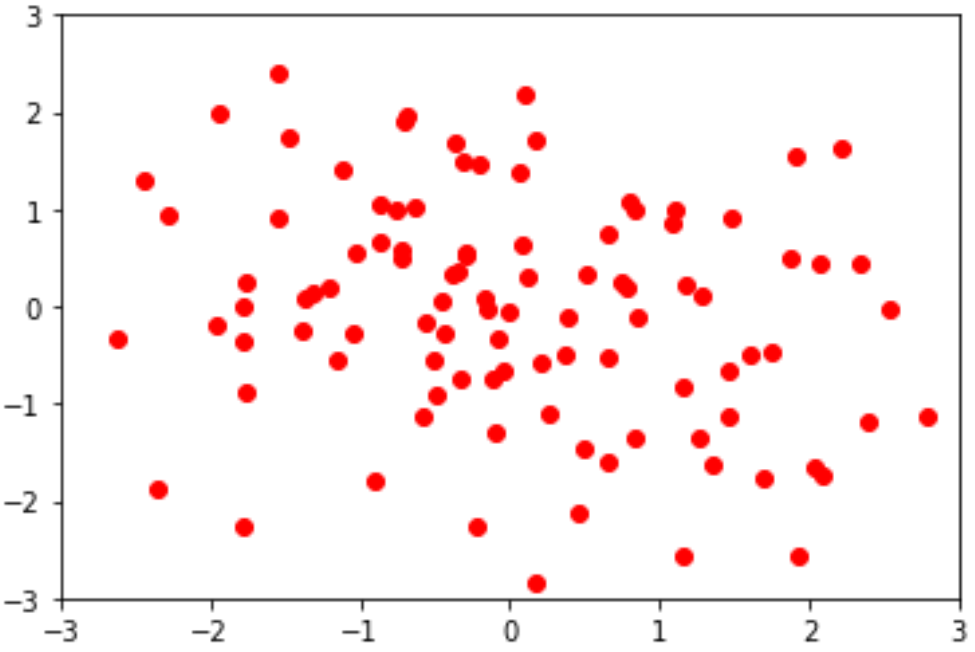
Germany,17

```
import matplotlib.pyplot as plt

x=['United States', 'Great Britain', 'China', 'Russia', 'Germany']
y=[46, 27, 26, 19, 17]

fig = plt.figure(figsize =(10, 7))
plt.pie(y, labels = x)

plt.show()
```


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




```
import matplotlib.pyplot as plt
from pylab import randn

x = randn(100)%-3+randn(100)%3
y = randn(100)%-3+randn(100)%3
#print(randn(100)%-3+randn(100)%3+randn(200)%5-wrong) only 100 produc
plt.scatter(x,y,color='r')
plt.axis([-3,3,-3,3])
plt.show()
```


3
2
1
0
−1
−2
−3
−3
−2
−1
0
1
2
3