Data Visualization examples

Steps before starting Data Visualiztion

install libraries

1. pandas

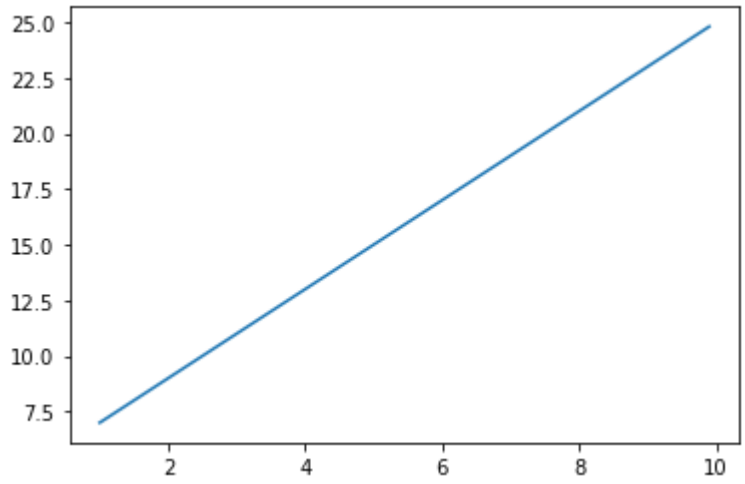
2. matplotlib

In [ ]:
```
import pandas as pd
```

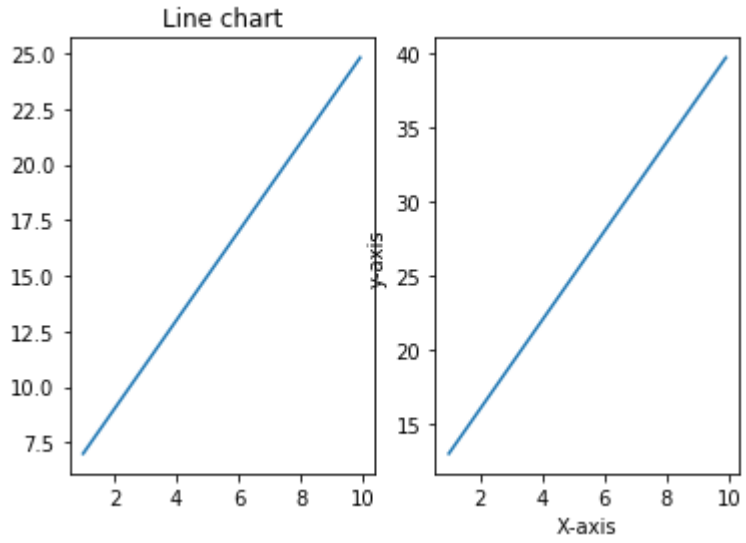
In [15]:
```
from matplotlib import pyplot as plt
import numpy as np
```

Line Graph

In [16]:
```
x=np.arange(1,10,0.1)
y=2*x+5
plt.plot(x,y)
plt.show()
```

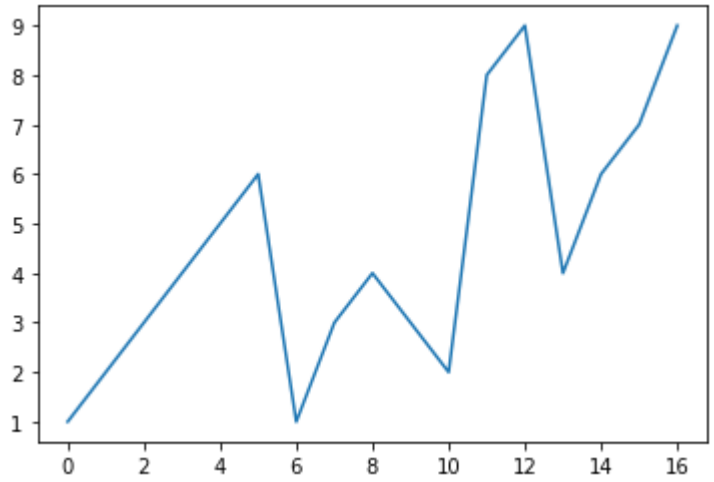


In [26]:
```
from matplotlib import pyplot as plt
import numpy as np

x= np.arange(1,10,0.1)
y1=2*x+5
y2=3*x+10

plt.subplot(1,2,1)
plt.title('Line chart')
plt.plot(x,y1)

plt.subplot(1,2,2)
plt.plot(x,y2)


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


plt.show()
```



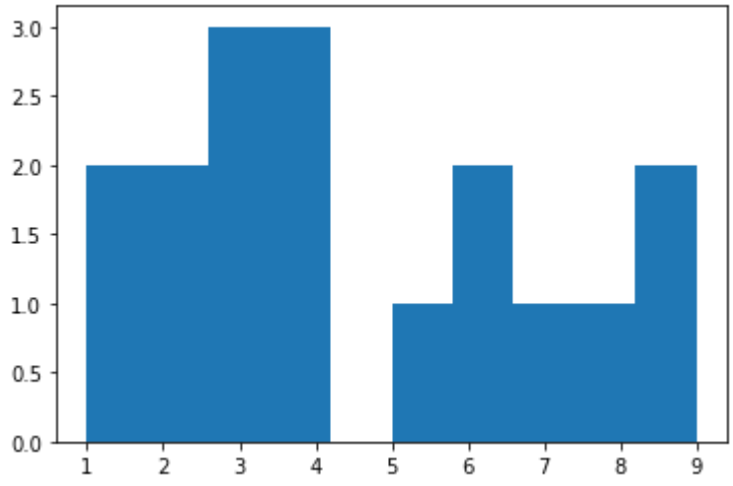
Plot Graph

In [17]:
```
data=[1,2,3,4,5,6,1,3,4,3,2,8,9,4,6,7,9]
plt.plot(data)
plt.show()
```



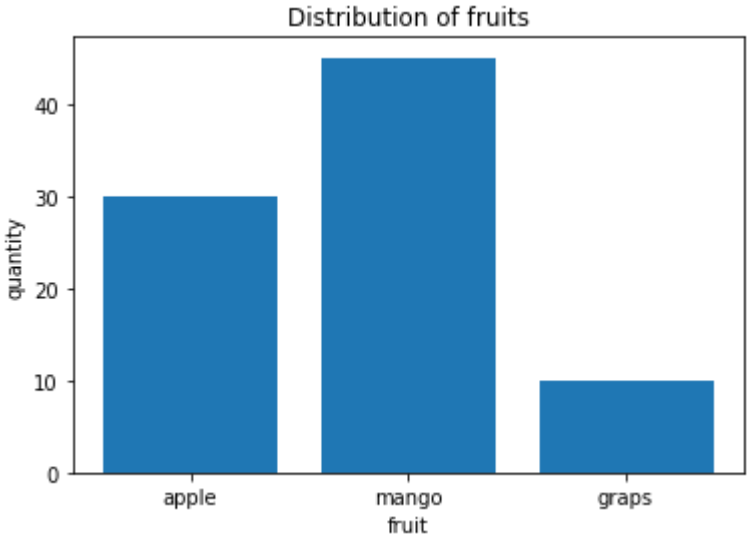
Histogram Graph

In [18]:
```
data=[1,2,3,4,5,6,1,3,4,3,2,8,9,4,6,7,9]
plt.hist(data)
plt.show()
```

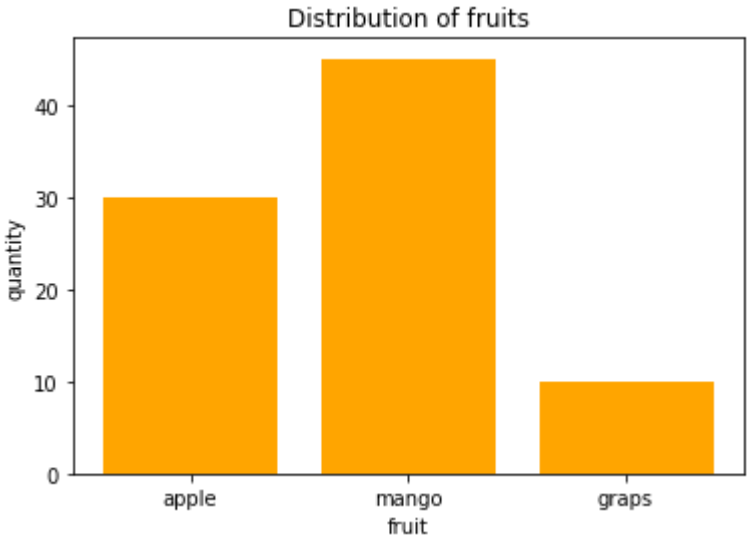


Bar Graph

In [29]:
```
from matplotlib import pyplot as plt
import numpy as np

fruit={'apple':30,'mango':45,'graps':10}
names=list(fruit.keys())
quantity=list(fruit.values())

plt.bar(names,quantity)
plt.title('Distribution of fruits')
plt.xlabel('fruit')
plt.ylabel ('quantity')
plt.show()
```

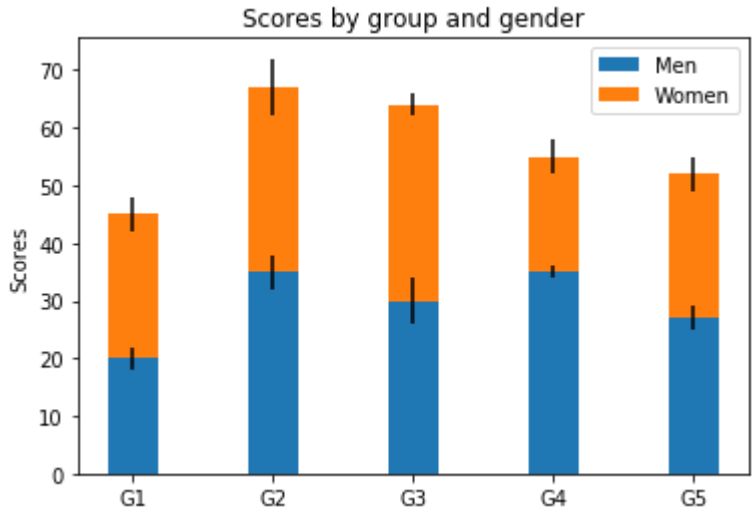


In [30]:
```
# TO change Color of Bars

from matplotlib import pyplot as plt
import numpy as np

fruit={'apple':30,'mango':45,'graps':10}
names=list(fruit.keys())
quantity=list(fruit.values())

plt.bar(names,quantity,color='orange')
plt.title('Distribution of fruits')
plt.xlabel('fruit')
plt.ylabel ('quantity')
plt.show()
```



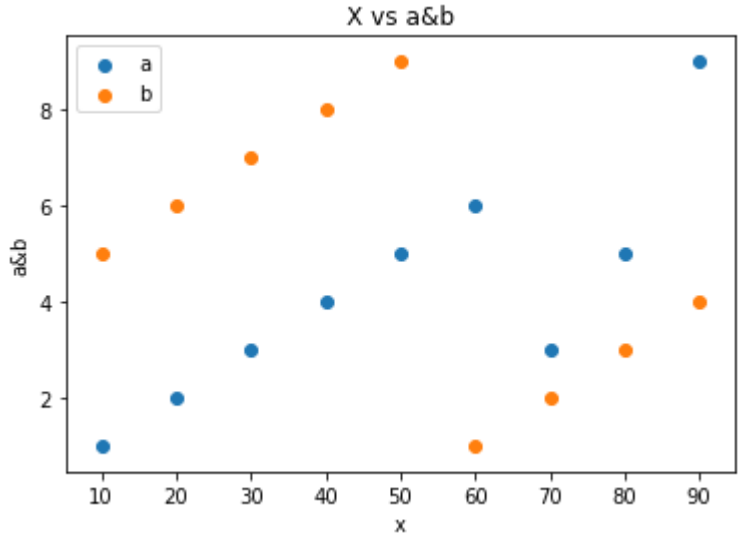
Example 2

In [21]:
```
import matplotlib.pyplot as plt
labels = ['G1', 'G2', 'G3', 'G4', 'G5']
men_means = [20, 35, 30, 35, 27]
women_means = [25, 32, 34, 20, 25]
men_std = [2, 3, 4, 1, 2]
women_std = [3, 5, 2, 3, 3]
width = 0.35 # the width of the bars: can also be len(x) sequence
fig, ax = plt.subplots()
ax.bar(labels, men_means, width, yerr=men_std, label='Men')
ax.bar(labels, women_means, width, yerr=women_std, bottom=men_means,
 label='Women')
ax.set_ylabel('Scores')
ax.set_title('Scores by group and gender')
ax.legend()
plt.show()
```

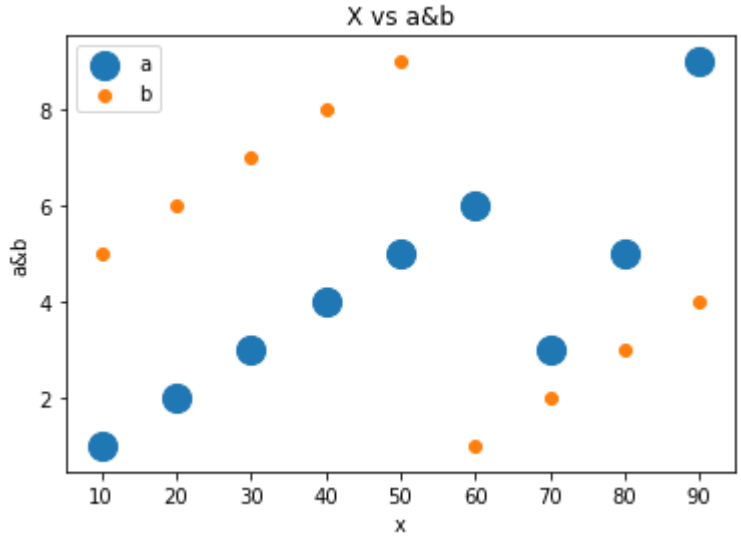


Scatter Plot

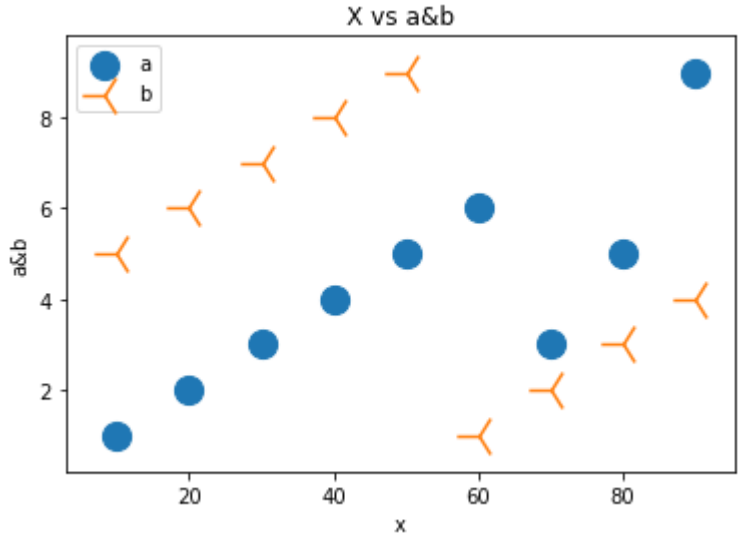
In [31]:
```
# scatter plot
from matplotlib import pyplot as plt

x=[10,20,30,40,50,60,70,80,90]
a=[1,2,3,4,5,6,3,5,9]
b=[5,6,7,8,9,1,2,3,4]

plt.scatter(x,a)
plt.scatter(x,b)
plt.legend(['a','b'])
plt.title('X vs a&b')
plt.xlabel('x')
plt.ylabel('a&b')
plt.show()
```



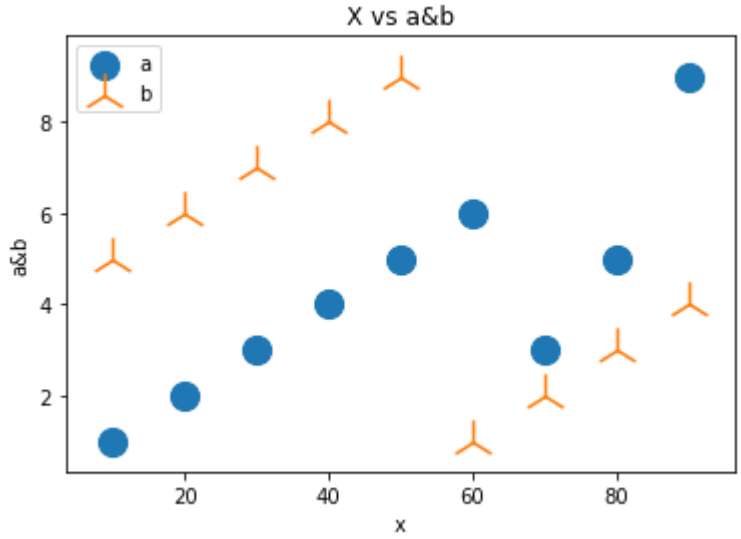
In [32]:
```
# To change size of a variable plot
# scatter plot

from matplotlib import pyplot as plt

x=[10,20,30,40,50,60,70,80,90]
a=[1,2,3,4,5,6,3,5,9]
b=[5,6,7,8,9,1,2,3,4]

plt.scatter(x,a,s=200)
plt.scatter(x,b)
plt.legend(['a','b'])
plt.title('X vs a&b')
plt.xlabel('x')
plt.ylabel('a&b')
plt.show()
```



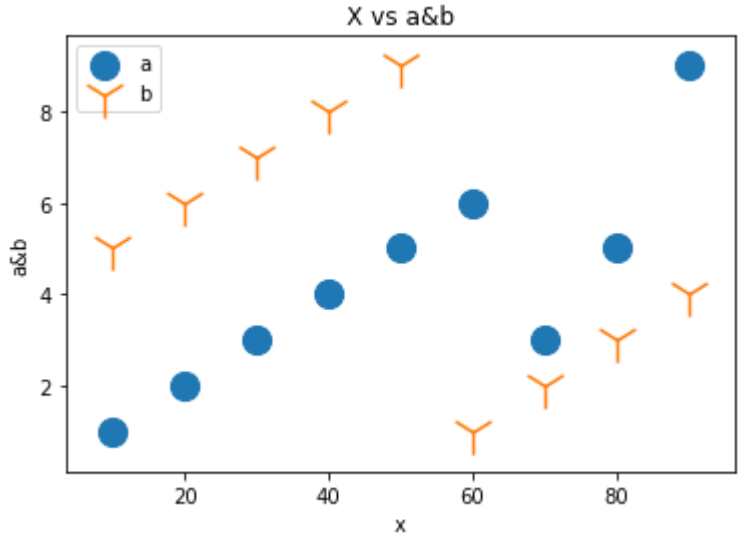
In [33]:
```
# To change size of a variable plot and Adding Marker =3
# scatter plot

from matplotlib import pyplot as plt

x=[10,20,30,40,50,60,70,80,90]
a=[1,2,3,4,5,6,3,5,9]
b=[5,6,7,8,9,1,2,3,4]

plt.scatter(x,a,s=200)
plt.scatter(x,b,s=500,marker='3')
plt.legend(['a','b'])
plt.title('X vs a&b')
plt.xlabel('x')
plt.ylabel('a&b')
plt.show()
```



In [34]:
```
# To change size of a variable plot and Adding Marker =2
# scatter plot

from matplotlib import pyplot as plt

x=[10,20,30,40,50,60,70,80,90]
a=[1,2,3,4,5,6,3,5,9]
b=[5,6,7,8,9,1,2,3,4]

plt.scatter(x,a,s=200)
plt.scatter(x,b,s=500,marker='2')
plt.legend(['a','b'])
plt.title('X vs a&b')
plt.xlabel('x')
plt.ylabel('a&b')
plt.show()
```

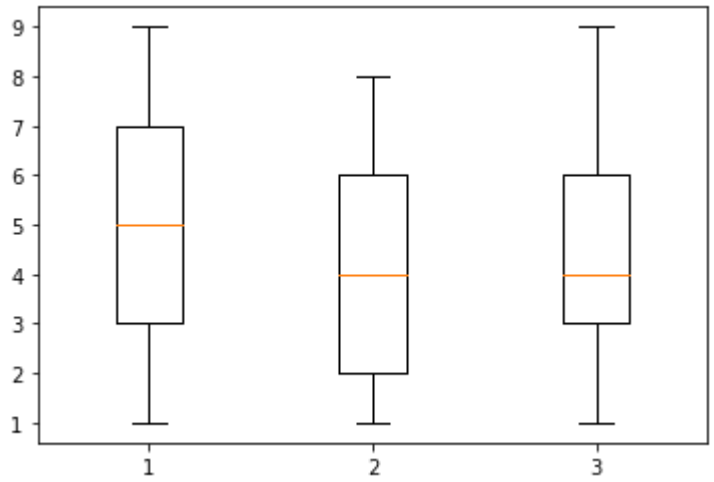


In [28]:
```
# scatter plot
from matplotlib import pyplot as plt

x=[10,20,30,40,50,60,70,80,90]
a=[1,2,3,4,5,6,3,5,9]
b=[5,6,7,8,9,1,2,3,4]

plt.scatter(x,a,s=200)
plt.scatter(x,b,s=500,marker='1')
plt.legend(['a','b'])
plt.title('X vs a&b')
plt.xlabel('x')
plt.ylabel('a&b')
plt.show()
```

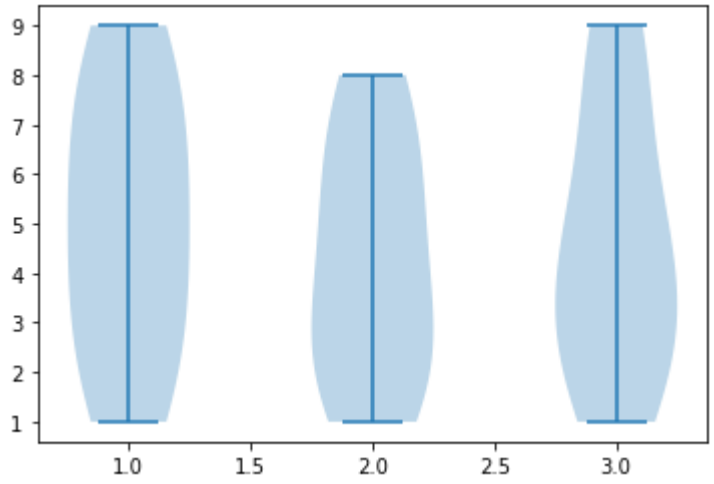


Box Plot

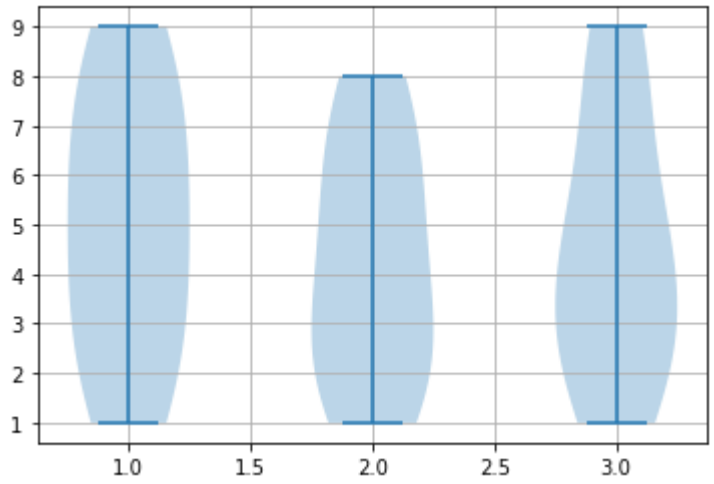
In [22]:
```
one = [1,2,3,4,5,6,7,8,9]
two = [2,3,1,4,5,7,8,6,2]
three =[3,2,4,5,6,8,9,1,3]
data=([one,two,three])
plt.boxplot(data)
plt.show()
```



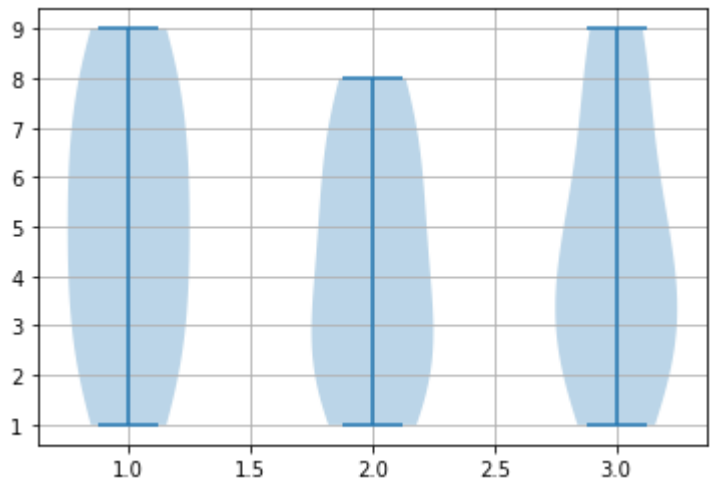
In [23]:
```
# violin form representation

one = [1,2,3,4,5,6,7,8,9]
two = [2,3,1,4,5,7,8,6,2]
three =[3,2,4,5,6,8,9,1,3]
data=([one,two,three])
plt.violinplot(data)
plt.show()
```



In [24]:
```
# repesentaion with grid lines

one = [1,2,3,4,5,6,7,8,9]
two = [2,3,1,4,5,7,8,6,2]
three =[3,2,4,5,6,8,9,1,3]
data=([one,two,three])
plt.violinplot(data)
plt.grid(data)
plt.show()
```



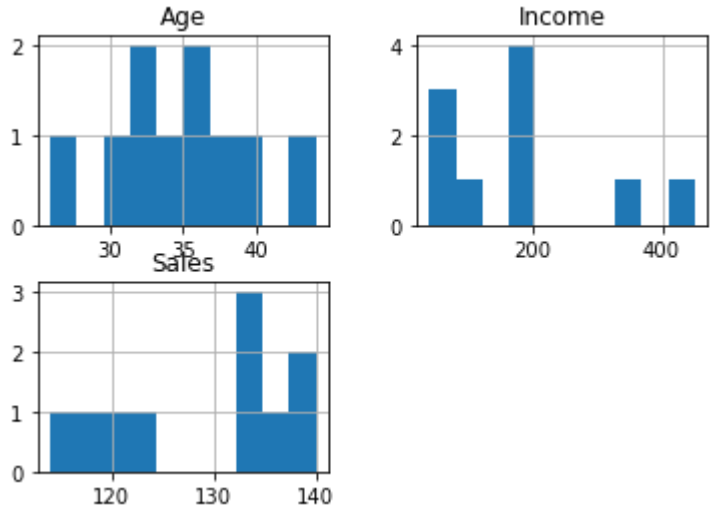
In [25]:
```
one = [1,2,3,4,5,6,7,8,9]
two = [2,3,1,4,5,7,8,6,2]
three =[3,2,4,5,6,8,9,1,3]
data=([one,two,three])
plt.violinplot(data)
plt.grid(True)
plt.show()
```



In [ ]:
```

```

Creation of Data Frame Model

In [19]:
```
# import pandas and matplotlib
import pandas as pd
import matplotlib.pyplot as plt

# create 2D array of table given above
data = [['E001', 'M', 34, 123, 'Normal', 350],
 ['E002', 'F', 40, 114, 'Overweight', 450],
 ['E003', 'F', 37, 135, 'Obesity', 169],
 ['E004', 'M', 30, 139, 'Underweight', 189],
 ['E005', 'F', 44, 117, 'Underweight', 183],
 ['E006', 'M', 36, 121, 'Normal', 80],
 ['E007', 'M', 32, 133, 'Obesity', 166],
  ['E008', 'F', 26, 140, 'Normal', 120],
 ['E009', 'M', 32, 133, 'Normal', 75],
 ['E010', 'M', 36, 133, 'Underweight', 40] ]

# dataframe created with
# the above data array
df = pd.DataFrame(data, columns = ['EMPID', 'Gender',
 'Age', 'Sales',
 'BMI', 'Income'] )

# create histogram for numeric data
df.hist()

# show plot
plt.show()
```



In [2]:
```
from matplotlib import pyplot as plt
import numpy as np
```

In [3]:
```
import os
```

In [4]:
```
pwd
```

Out[4]: '/home/jovyan'

To Read CSV files

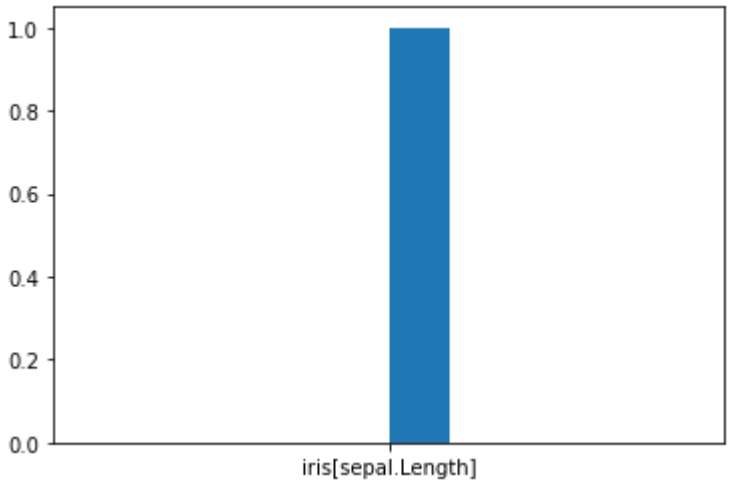
fist upload the respective file in drive and copy the path

In [58]:
```
pd.read_csv("iris.csv")
```

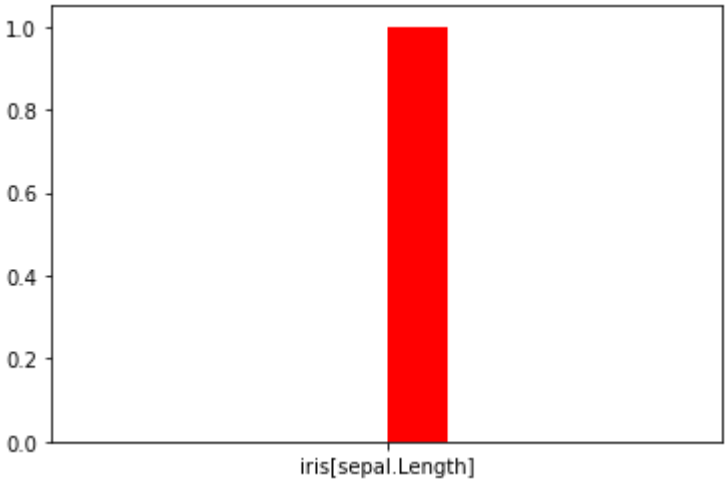
Out[58]:

	Unnamed: 0	sepal.Length	sepal.width	petal.Length	petal.width	Species
0	0	5.1	3.5	1.4	0.2	setosa
1	1	4.9	3.0	1.4	0.2	setosa
2	2	4.7	3.2	1.3	0.2	setosa
3	3	4.6	3.1	1.5	0.2	setosa
4	4	5.0	3.6	1.4	0.2	setosa

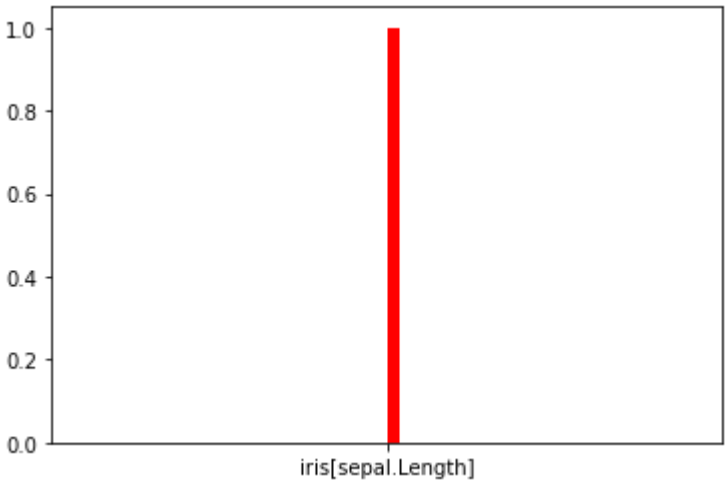
In [46]:
```
# to view the above table data in histogram representation

plt.hist('iris[sepal.Length]')
plt.show()
```



In [52]:
```
# to view the above table data in histogram representation
import pandas as pd
pd.read_csv("iris.csv")
plt.hist('iris[sepal.Length]',color='red')
plt.show()
```

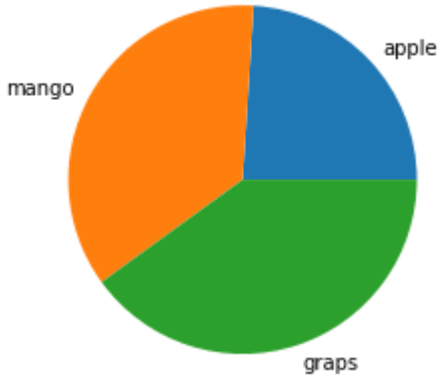


In [59]:
```
# to view the above table data in histogram representation to show bins
import pandas as pd
pd.read_csv("iris.csv")
plt.hist('iris[sepal.Length]',color='red',bins=50)
plt.show()
```

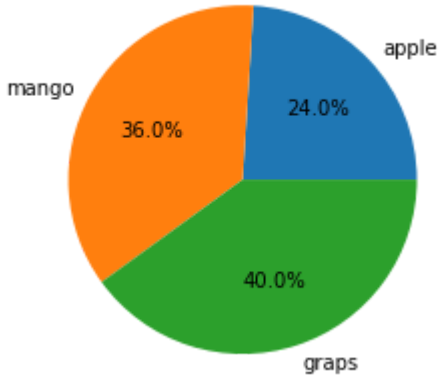


Pie chart

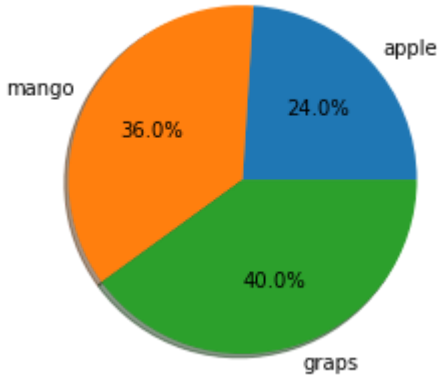
In [64]:
```
from matplotlib import pyplot as plt
import numpy as np

fruit=['apple','mango','graps']
quantity=[30,45,50]
plt.pie(quantity,labels=fruit)
plt.show()
```



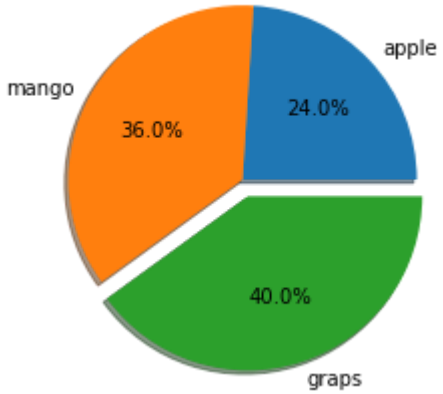
In [66]:
```
# To add percentage

from matplotlib import pyplot as plt
import numpy as np

fruit=['apple','mango','graps']
quantity=[30,45,50]
plt.pie(quantity,labels=fruit,autopct='%0.1f%%')
plt.show()
```



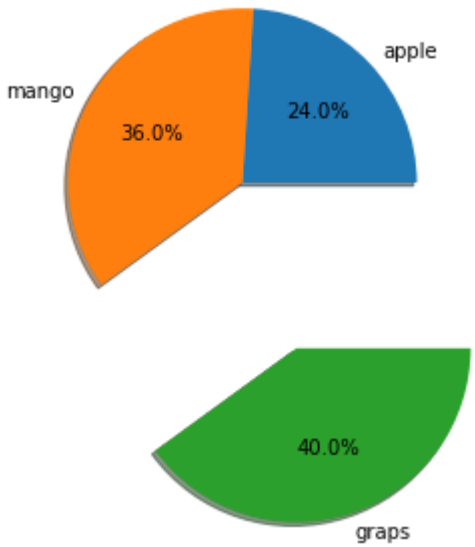
In [67]:
```
# to add a shadow

# To add percentage

from matplotlib import pyplot as plt
import numpy as np

fruit=['apple','mango','graps']
quantity=[30,45,50]
plt.pie(quantity,labels=fruit,autopct='%0.1f%%',shadow=True)
plt.show()
```



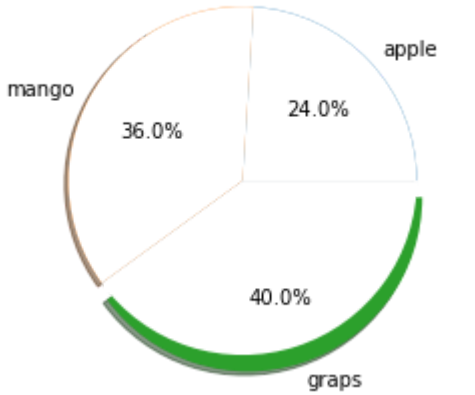
In [68]:
```
# to highlite slices with explode=0.1 to separate graps


from matplotlib import pyplot as plt
import numpy as np

fruit=['apple','mango','graps']
quantity=[30,45,50]
plt.pie(quantity,labels=fruit,autopct='%0.1f%%',shadow=True,explode=(0,0,0.1))
plt.show()
```



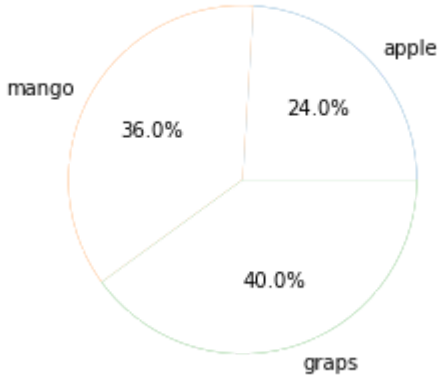
In [69]:
```
# to highlite slices where explode =1


from matplotlib import pyplot as plt
import numpy as np

fruit=['apple','mango','graps']
quantity=[30,45,50]
plt.pie(quantity,labels=fruit,autopct='%0.1f%%',shadow=True,explode=(0,0,1))
plt.show()
```



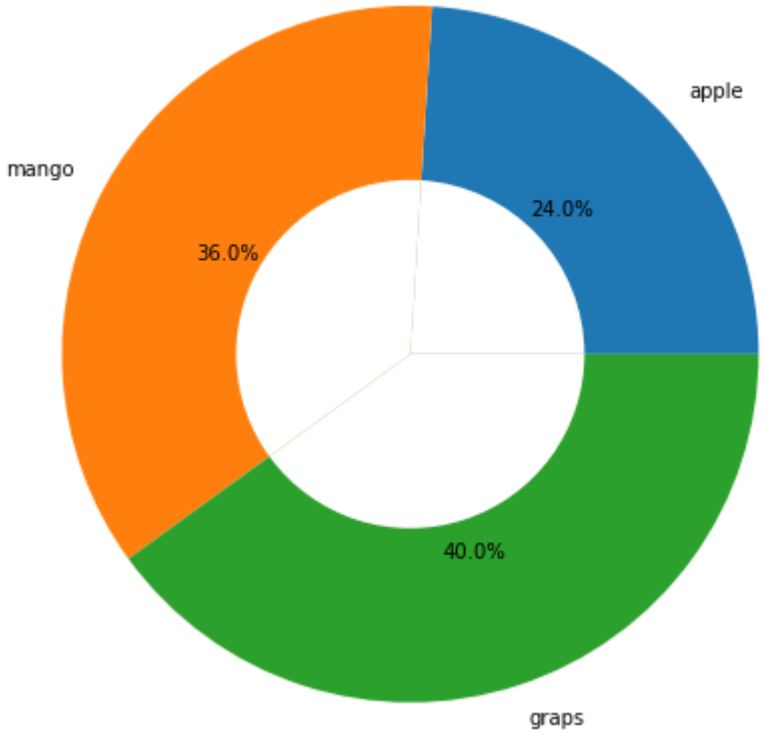
In [71]:
```
from matplotlib import pyplot as plt
import numpy as np

fruit=['apple','mango','graps']
quantity=[30,45,50]
pie1=plt.pie(quantity,labels=fruit,autopct='%0.1f%%',shadow=True,explode=(0,0,
0.1))
pie2=plt.pie(quantity,colors='w')
plt.show()
```



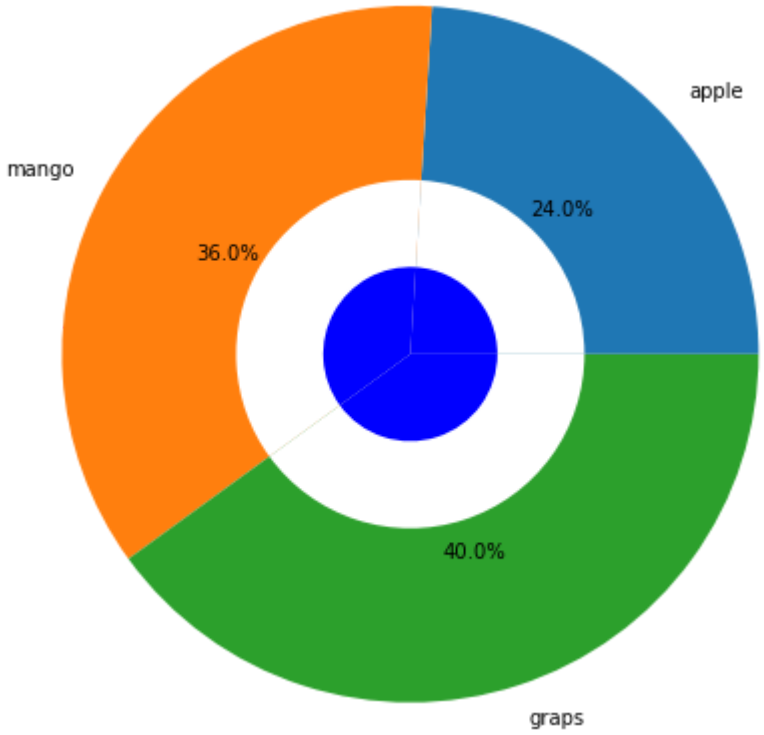
In [72]:
```
from matplotlib import pyplot as plt
import numpy as np

fruit=['apple','mango','graps']
quantity=[30,45,50]
pie1=plt.pie(quantity,labels=fruit,autopct='%0.1f%%')
pie2=plt.pie(quantity,colors='w')
plt.show()
```



In [78]:
```
# to set radius

from matplotlib import pyplot as plt
import numpy as np

fruit=['apple','mango','graps']
quantity=[30,45,50]
pie1=plt.pie(quantity,labels=fruit,autopct='%0.1f%%',radius=2)
pie2=plt.pie(quantity,colors='w',radius=1)
plt.show()
```

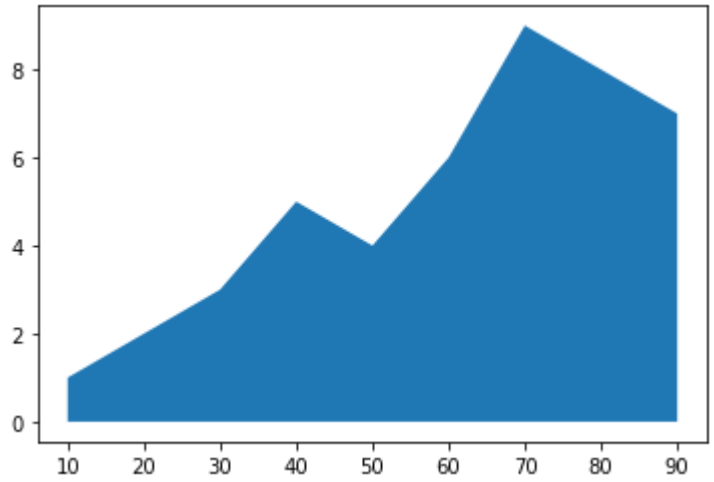


In [86]:
```
# to create a sub circle in pie chart use pie3 and set radius= 0.5

from matplotlib import pyplot as plt
import numpy as np

fruit=['apple','mango','graps']
quantity=[30,45,50]
pie1=plt.pie(quantity,labels=fruit,autopct='%0.1f%%',radius=2)
pie2=plt.pie(quantity,colors='w',radius=1)
pie3=plt.pie(quantity,colors='b',radius=0.5)
plt.show()
```

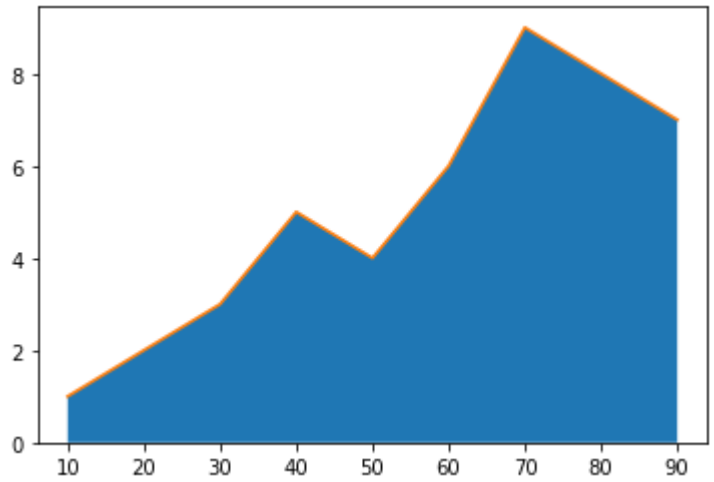


Area plot

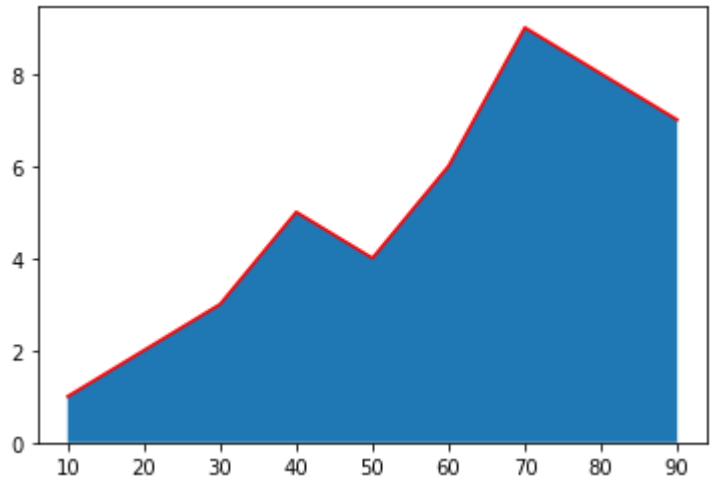
In [79]:
```
x=[10,20,30,40,50,60,70,80,90]
y=[1,2,3,5,4,6,9,8,7]
plt.stackplot(x,y)
plt.show()
```



In [87]:
```
# To have a line plot on area plot

x=[10,20,30,40,50,60,70,80,90]
y=[1,2,3,5,4,6,9,8,7]
plt.stackplot(x,y)
plt.plot(x,y)
plt.show()
```



In [91]:
```
# To have a line plot on area plot and change color of line

x=[10,20,30,40,50,60,70,80,90]
y=[1,2,3,5,4,6,9,8,7]
plt.stackplot(x,y)
plt.plot(x,y,color='red')
plt.show()
```



In [1]:
```
import pandas as pd
import matplotlib.pyplot as plt
```

In [2]:
```
import os
```

In [3]:
```
pwd
```

Out[3]:
```
'C:\\Users\\Rajesh Rai Tihari\\Desktop\\IOTBIACLASS'
```

In [4]:
```
data =pd.read_csv('E:/dataset/andhra1.csv')
data.head()
```

Out[4]:

	state code	District code	State/District	Census Year	Persons	Absolute	Percentage	Males	Female
0	28	0	ANDHRA PRADESH	1901	19,065,921	-----	-----	9,607,091	9,458,83
1	28	0	ANDHRA PRADESH	1911	21,447,412	2,381,491	12.49	10,769,322	10,678,09
2	28	0	ANDHRA PRADESH	1921	21,420,448	-26,964	-0.13	10,749,220	10,671,22
3	28	0	ANDHRA PRADESH	1931	24,203,573	2,783,125	12.99	12,183,673	12,019,90
4	28	0	ANDHRA PRADESH	1941	27,289,340	3,085,767	12.75	13,782,365	13,506,97

In [ ]:
```

```