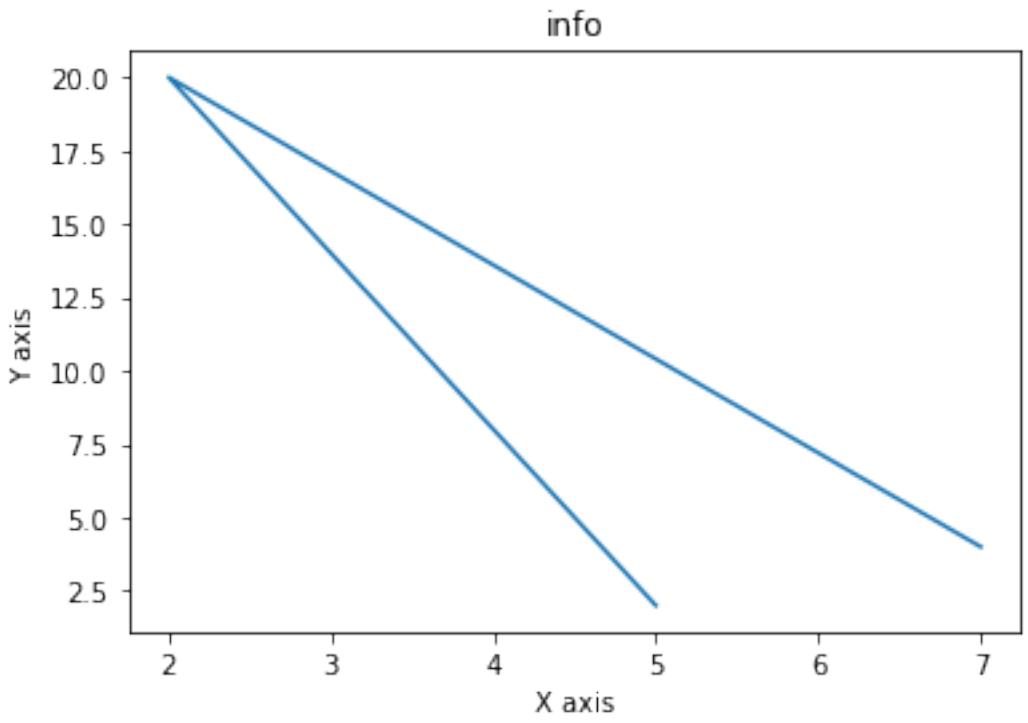
data visualization

July 26, 2022

[1]:
```
!pip install matplotlib
from matplotlib import pyplot as plt
import numpy as np
```

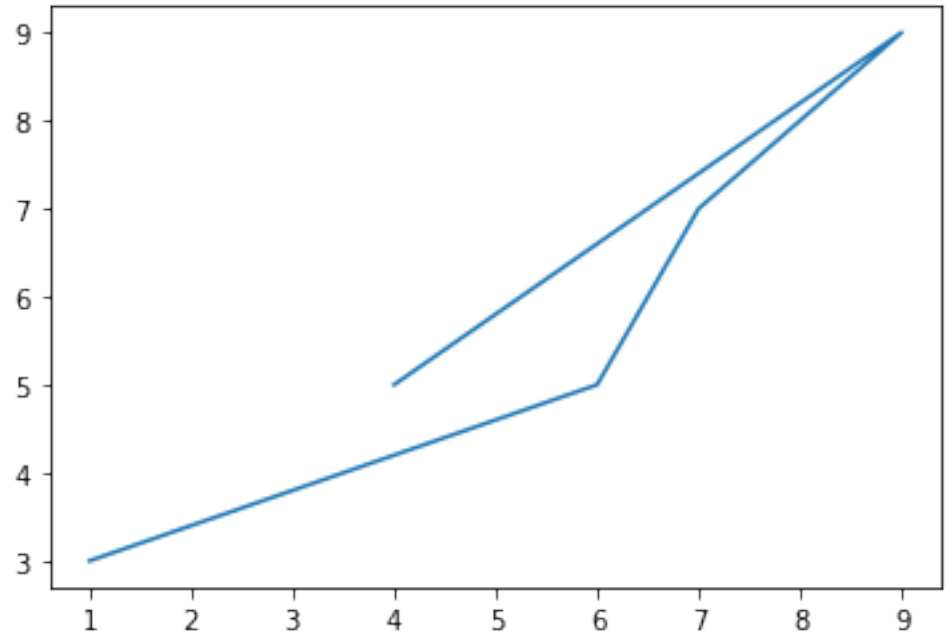
```
Requirement already satisfied: matplotlib in d:\anakonda\lib\site-packages
(3.5.1)
Requirement already satisfied: kiwisolver>=1.0.1 in d:\anakonda\lib\site-
packages (from matplotlib) (1.3.2)
Requirement already satisfied: python-dateutil>=2.7 in d:\anakonda\lib\site-
packages (from matplotlib) (2.8.2)
Requirement already satisfied: fonttools>=4.22.0 in d:\anakonda\lib\site-
packages (from matplotlib) (4.25.0)
Requirement already satisfied: cycler>=0.10 in d:\anakonda\lib\site-packages
(from matplotlib) (0.11.0)
Requirement already satisfied: numpy>=1.17 in d:\anakonda\lib\site-packages
(from matplotlib) (1.21.5)
Requirement already satisfied: pillow>=6.2.0 in d:\anakonda\lib\site-packages
(from matplotlib) (9.0.1)
Requirement already satisfied: packaging>=20.0 in d:\anakonda\lib\site-packages
(from matplotlib) (21.3)
Requirement already satisfied: pyparsing>=2.2.1 in d:\anakonda\lib\site-packages
(from matplotlib) (3.0.4)
Requirement already satisfied: six>=1.5 in d:\anakonda\lib\site-packages (from
python-dateutil>=2.7->matplotlib) (1.16.0)
```

[2]:
```
x=[5,2,7]
y=[2,20,4]
plt.plot(x,y)
plt.title('info')
plt.ylabel('Y axis')
plt.xlabel('X axis')
plt.show()
```

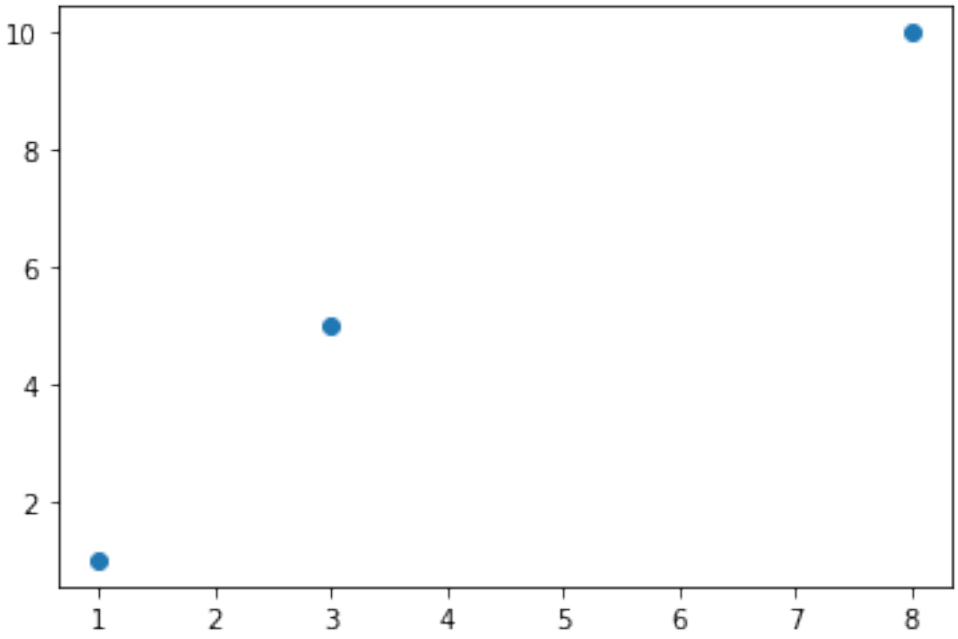


[3]:
```
xpoint=np.array([1,6,7,9,4])
ypoint=np.array([3,5,7,9,5])
plt.plot(xpoint,ypoint)
plt.show
```

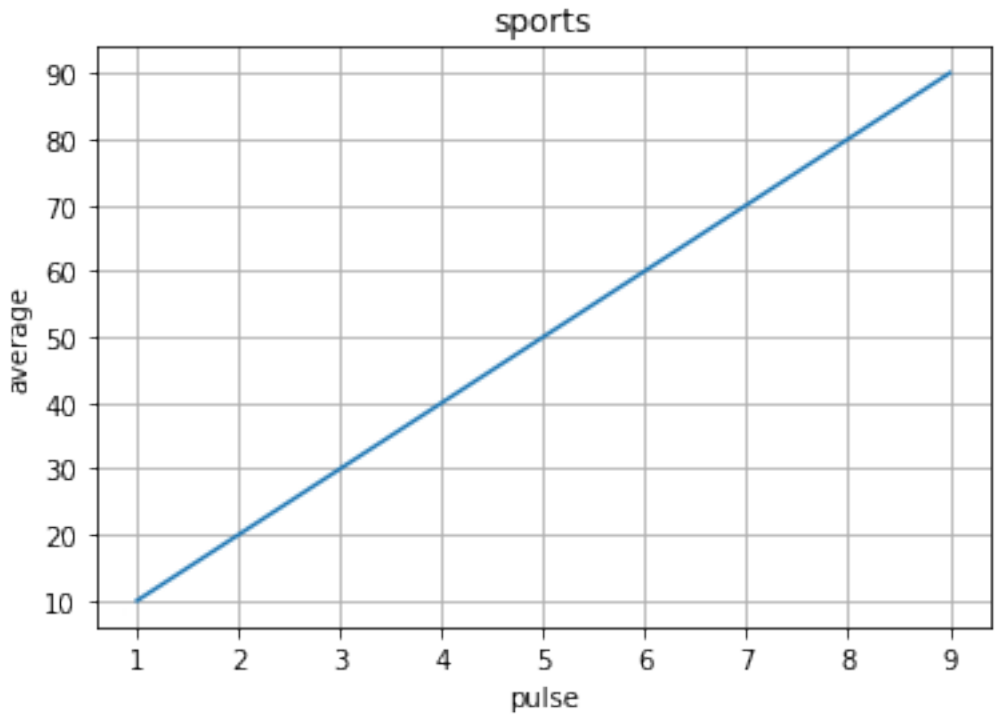
[3]: <function matplotlib.pyplot.show(close=None, block=None)>



[4]:
```
xpoint=np.array([1,8,3])
ypoint=np.array([1,10,5])

plt.plot(xpoint, ypoint,'o')
plt.show()
```

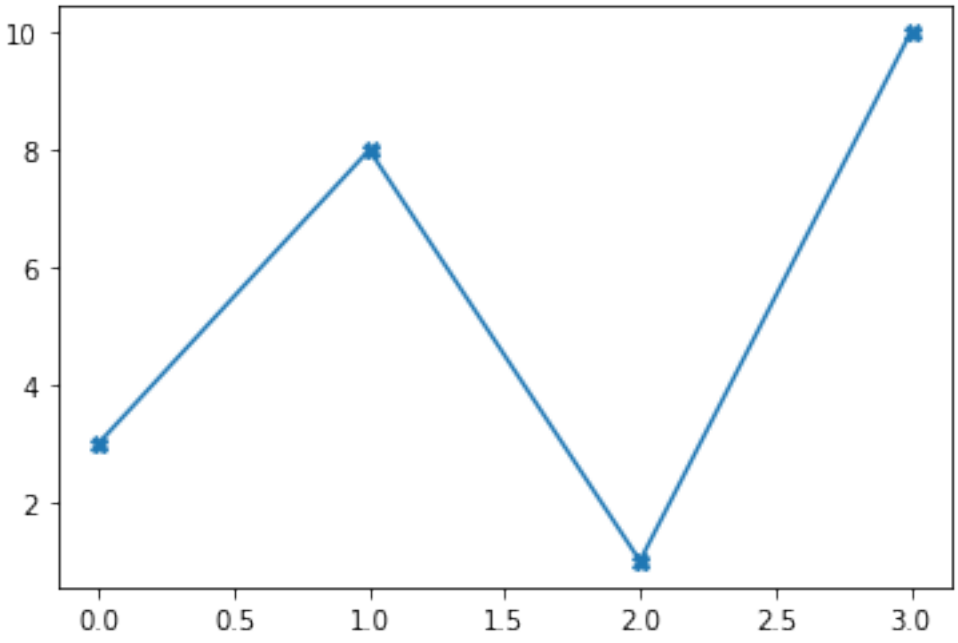


[5]:
```
x=np.array([1,2,3,4,5,6,7,8,9])
y=np.array([10,20,30,40,50,60,70,80,90])
plt.title('sports')
plt.ylabel('average')
plt.xlabel('pulse')

plt.plot(x,y)
plt.grid()
plt.show()
```

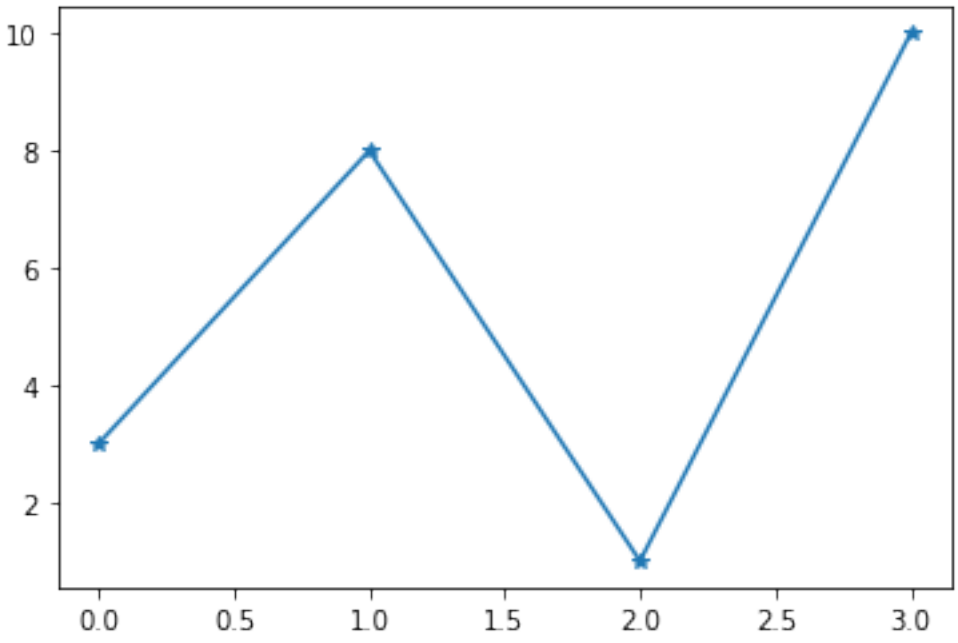


[6]:
```
# markers
```

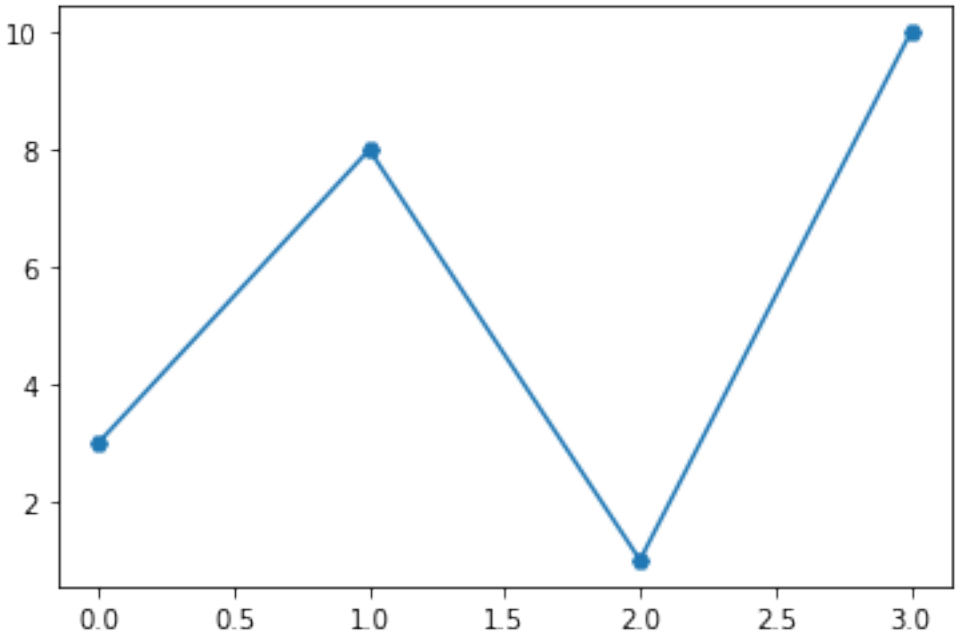
[7]:
```
ypoint=np.array([3,8,1,10])
plt.plot(ypoint,marker='X')
plt.show()
```



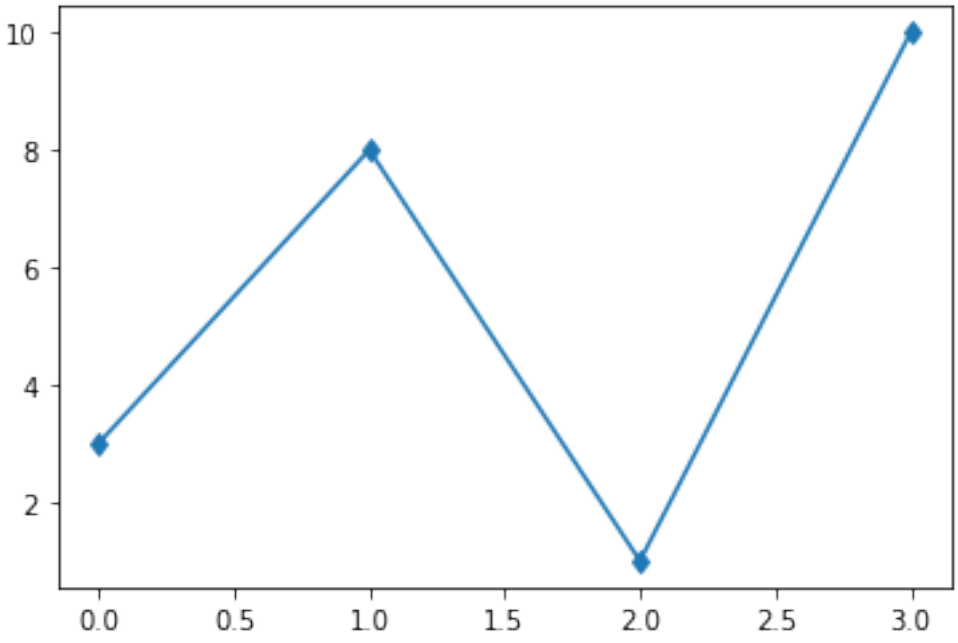
[8]:
```
ypoint=np.array([3,8,1,10])
plt.plot(ypoint,marker='*')
plt.show()
```



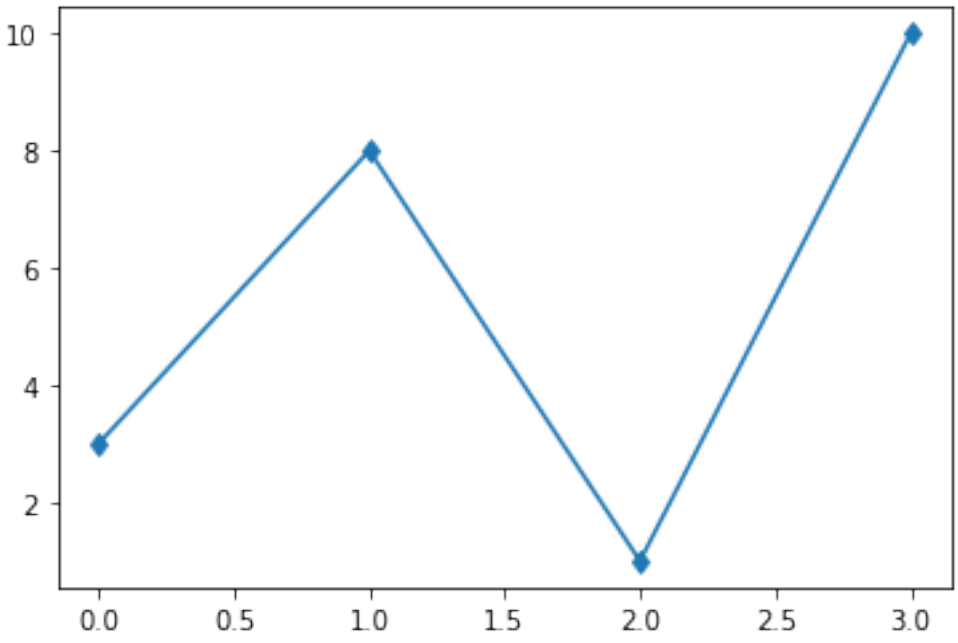
[9]:
```
ypoint=np.array([3,8,1,10])
plt.plot(ypoint,marker='H')
plt.show()
```



[10]:
```
ypoint=np.array([3,8,1,10])
plt.plot(ypoint,marker='d')
plt.show()
```



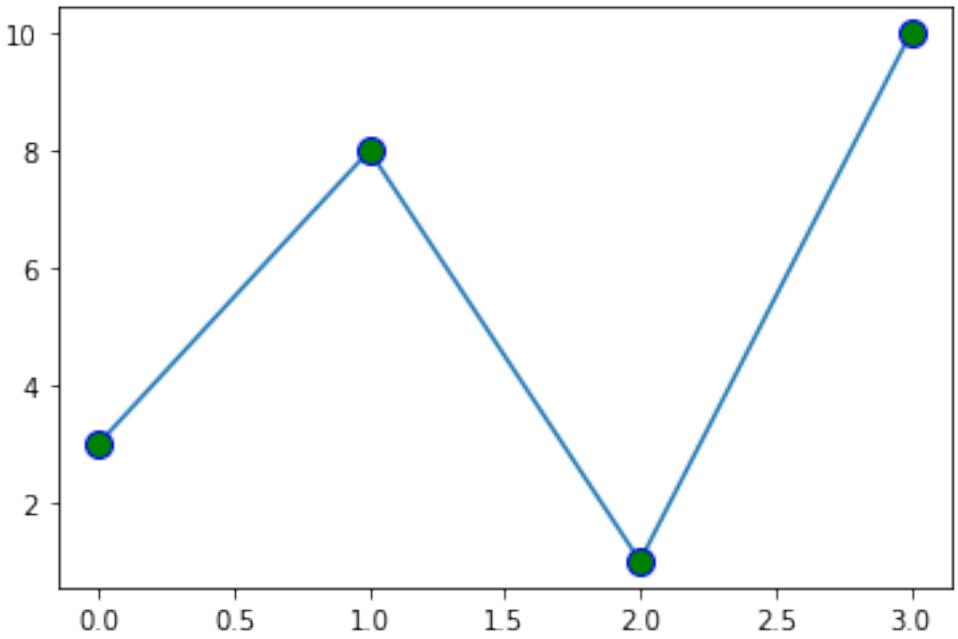
[11]:
```
ypoint=np.array([3,8,1,10])
plt.plot(ypoint,marker='d')
plt.show()
```



[12]:
```
# marker colors
```

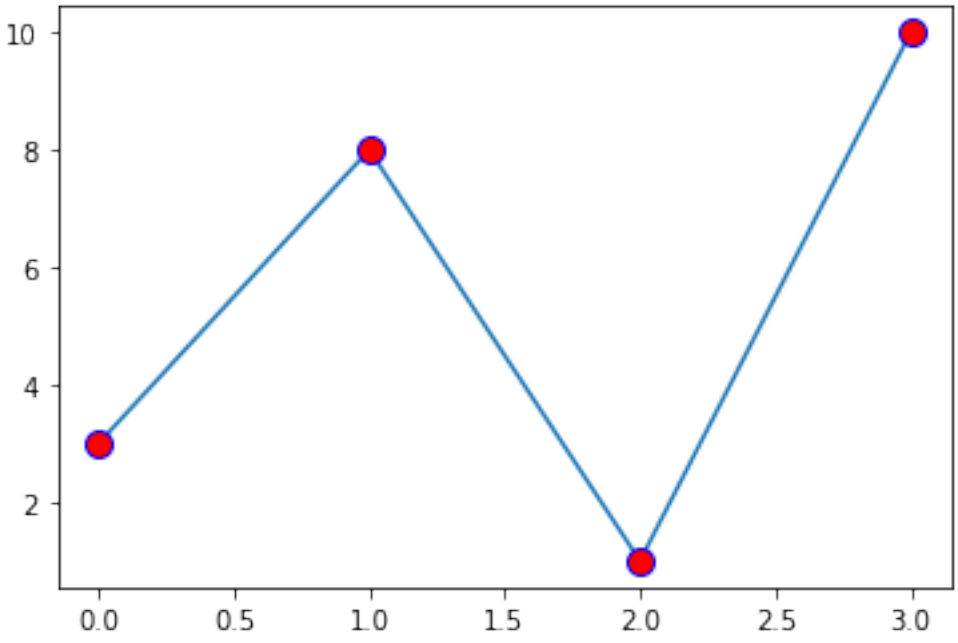
[13]:
```
plt.plot(ypoint,marker='o',ms=10,mec='b',mfc='g')
```

[13]:
```
[<matplotlib.lines.Line2D at 0x241a7dadf10>]
```



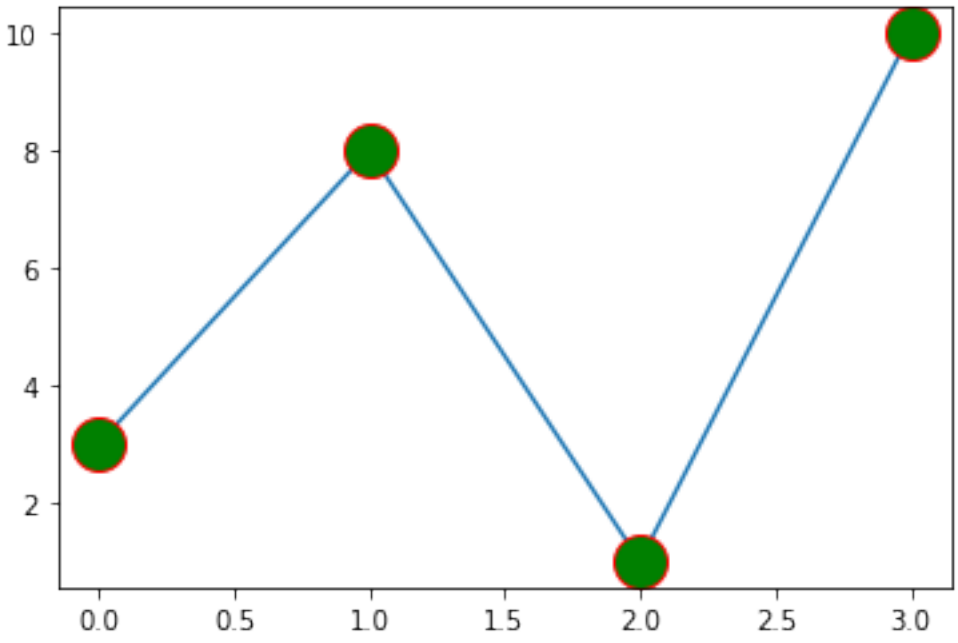
[14]:
```
plt.plot(ypoint,marker='o',ms=10,mec='b',mfc='r')
```

[14]:
```
[<matplotlib.lines.Line2D at 0x241a7e0ff10>]
```



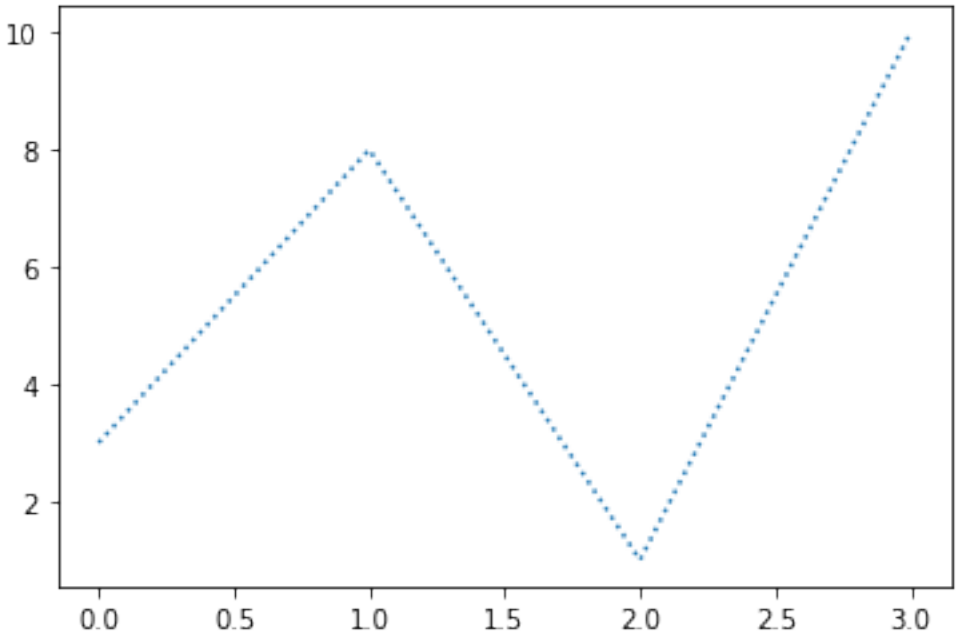
[15]:
```
plt.plot(ypoint,marker='o',ms=20,mec='r',mfc='g')
```

[15]: [<matplotlib.lines.Line2D at 0x241a7d61580>]

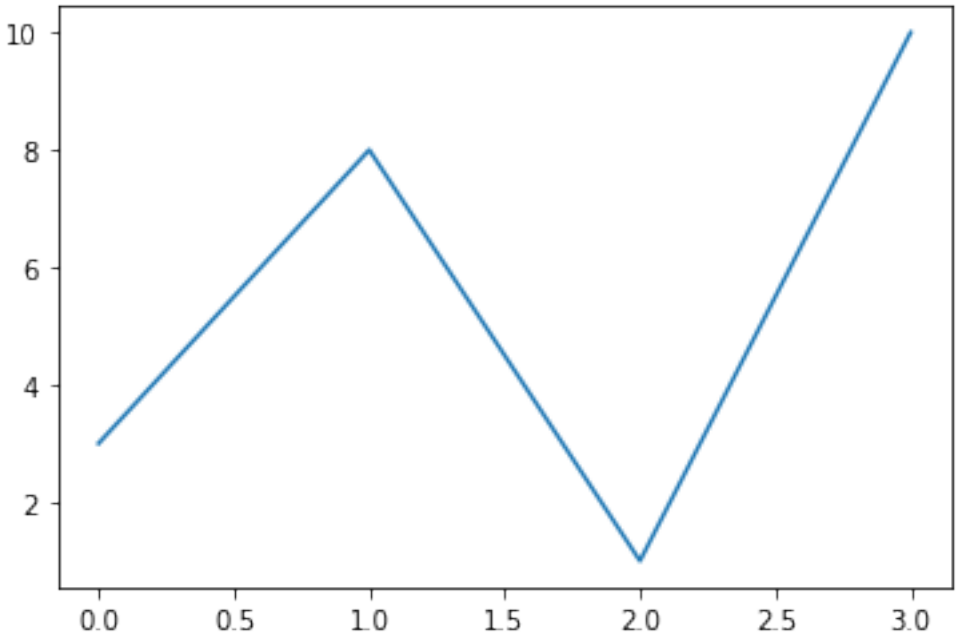


[16]:
```
# line plot
```

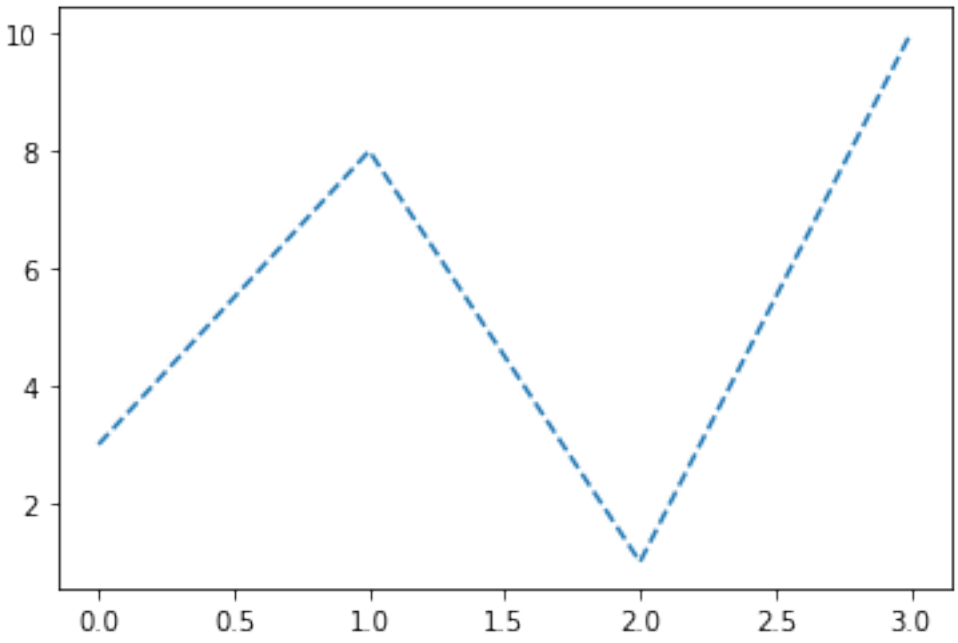
[17]:
```
ypoint=np.array([3,8,1,10])

plt.plot(ypoint,linestyle='dotted')
plt.show()
```



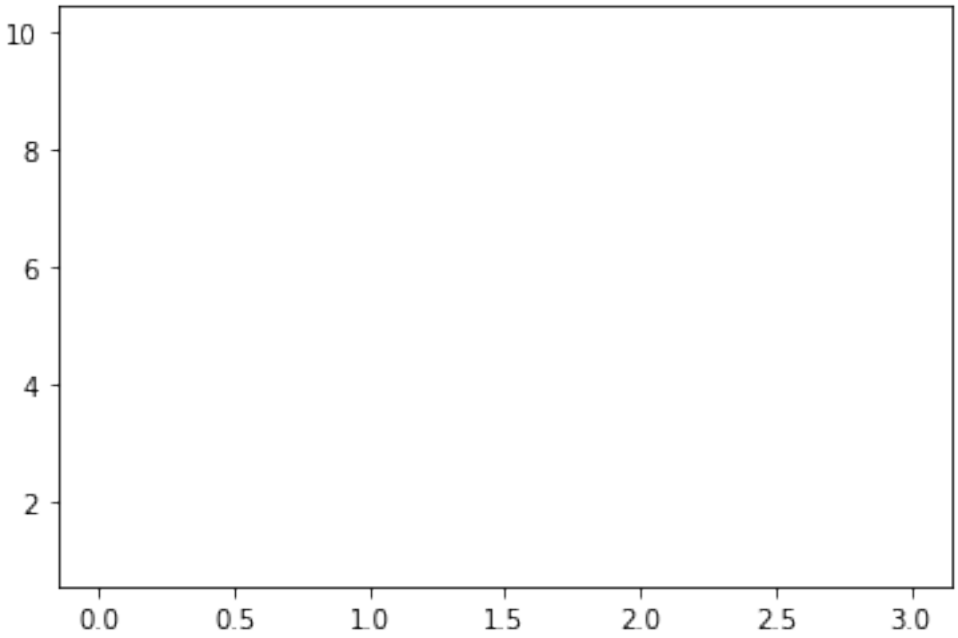
[18]:
```
ypoint=np.array([3,8,1,10])

plt.plot(ypoint,linestyle='-')
plt.show()
```



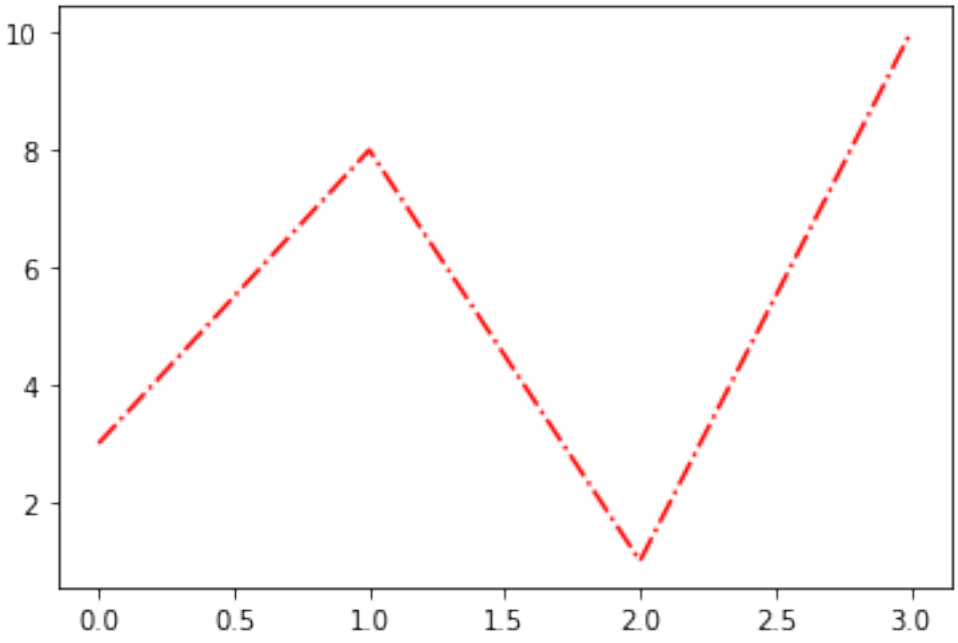
[19]:
```
ypoint=np.array([3,8,1,10])

plt.plot(ypoint,linestyle='--')
plt.show()
```



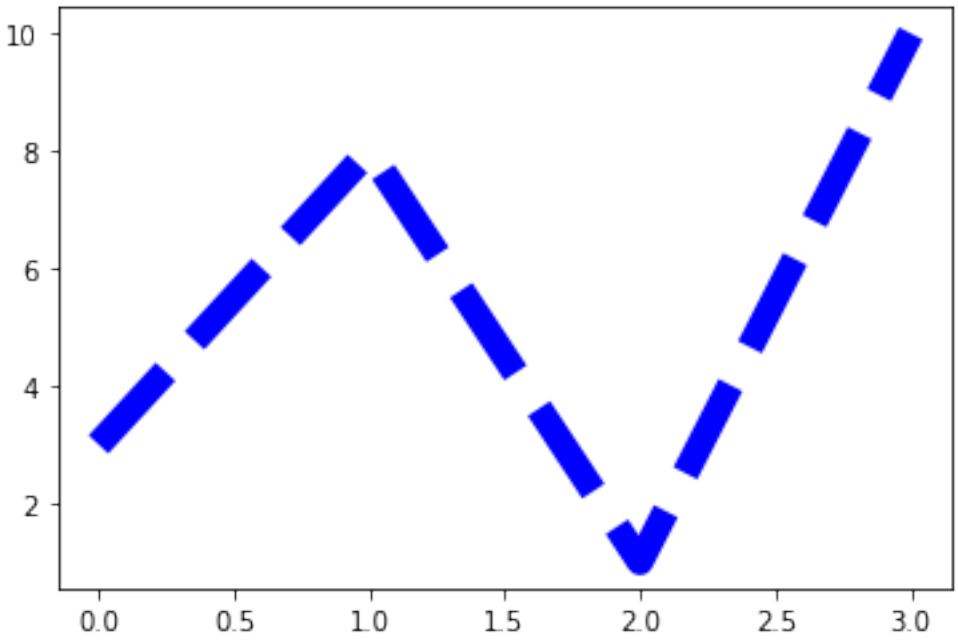
[20]:
```
ypoint=np.array([3,8,1,10])

plt.plot(ypoint,linestyle='none')
plt.show()
```



[21]:
```
ypoint=np.array([3,8,1,10])

plt.plot(ypoint,linestyle='dashdot',color='r')
plt.show()
```



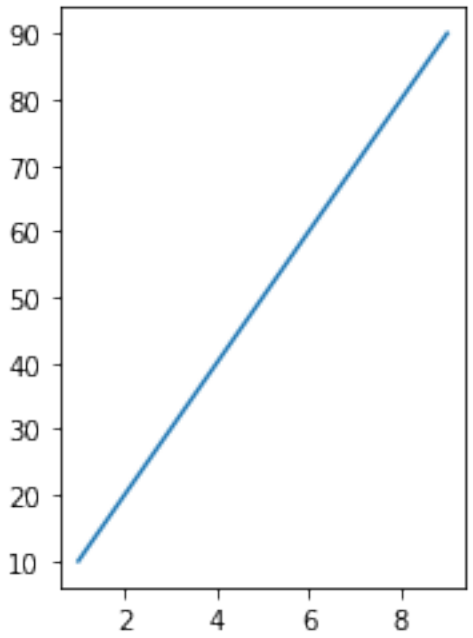
[22]:
```
ypoint=np.array([3,8,1,10])

plt.plot(ypoint,linestyle='--',color='b',linewidth=10)
plt.show()
```



[23]:
```
# subplot
```

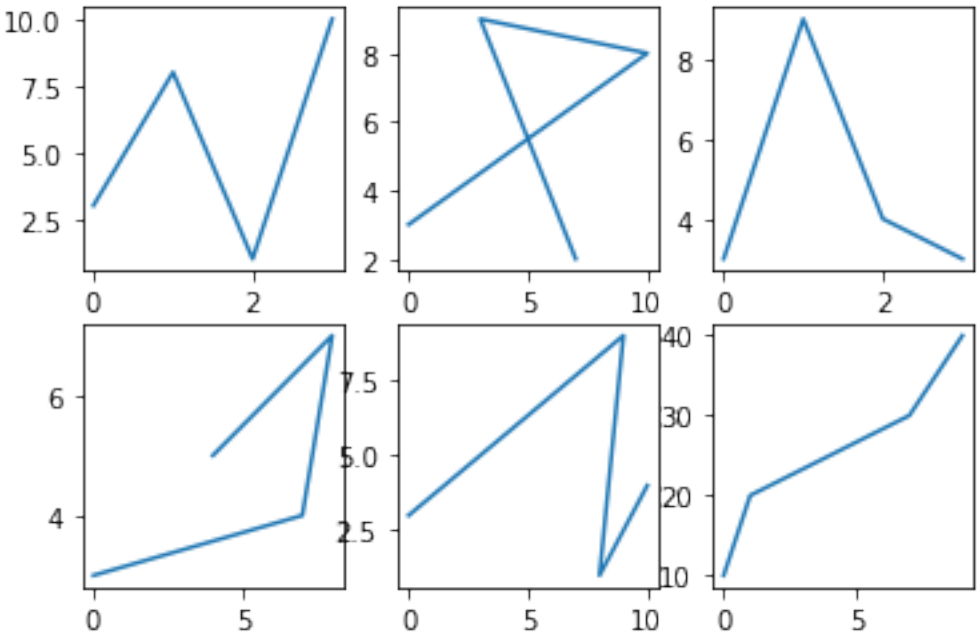
[24]:
```
xpoint=np.array([0,1,2,3])
ypoint=np.array([3,8,1,10])
print(x)
print(y)
plt.subplot(1,2,1)
plt.plot(x,y)
plt.show()
```

```
[1 2 3 4 5 6 7 8 9]
[10 20 30 40 50 60 70 80 90]
```



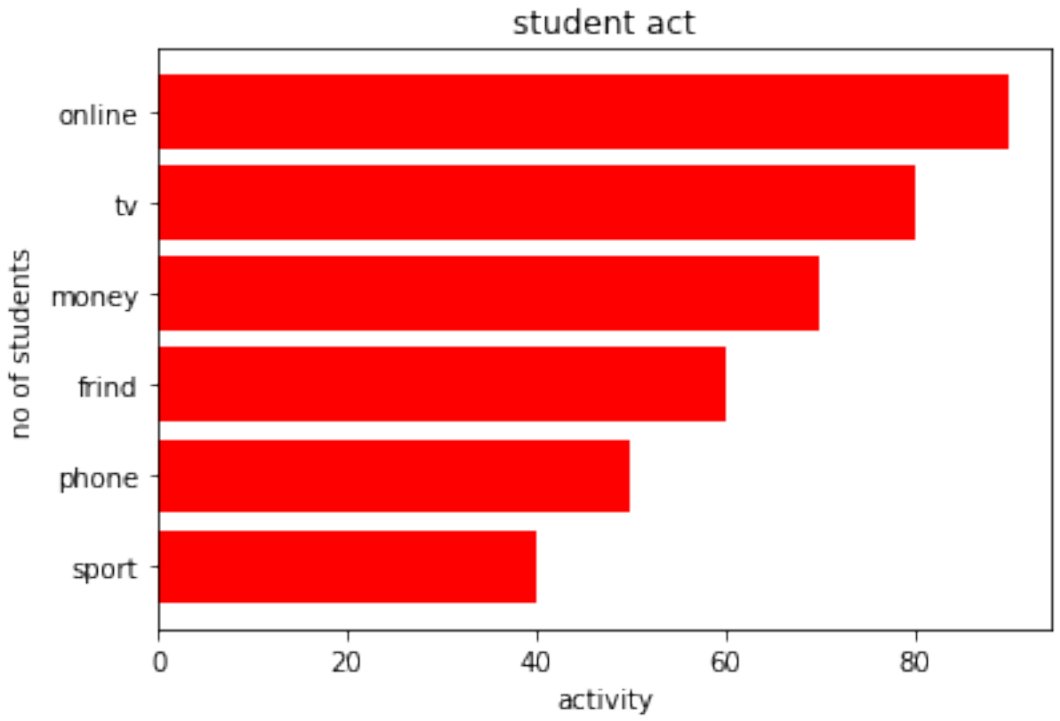
[25]:
```
x=np.array([0,1,2,3])
y=np.array([3,8,1,10])

plt.subplot(2,3,1)
plt.plot(x,y)

x=np.array([0,10,3,7])
y=np.array([3,8,9,2])

plt.subplot(2,3,2)
plt.plot(x,y)

x=np.array([0,1,2,3])
```

```
y=np.array([3,9,4,3])

plt.subplot(2,3,3)
plt.plot(x,y)

x=np.array([0,7,8,4])
y=np.array([3,4,7,5])

plt.subplot(2,3,4)
plt.plot(x,y)

x=np.array([0,9,8,10])
y=np.array([3,9,1,4])

plt.subplot(2,3,5)
plt.plot(x,y)

x=np.array([0,1,7,9])
y=np.array([10,20,30,40])

plt.subplot(2,3,6)
plt.plot(x,y)

plt.show()
```

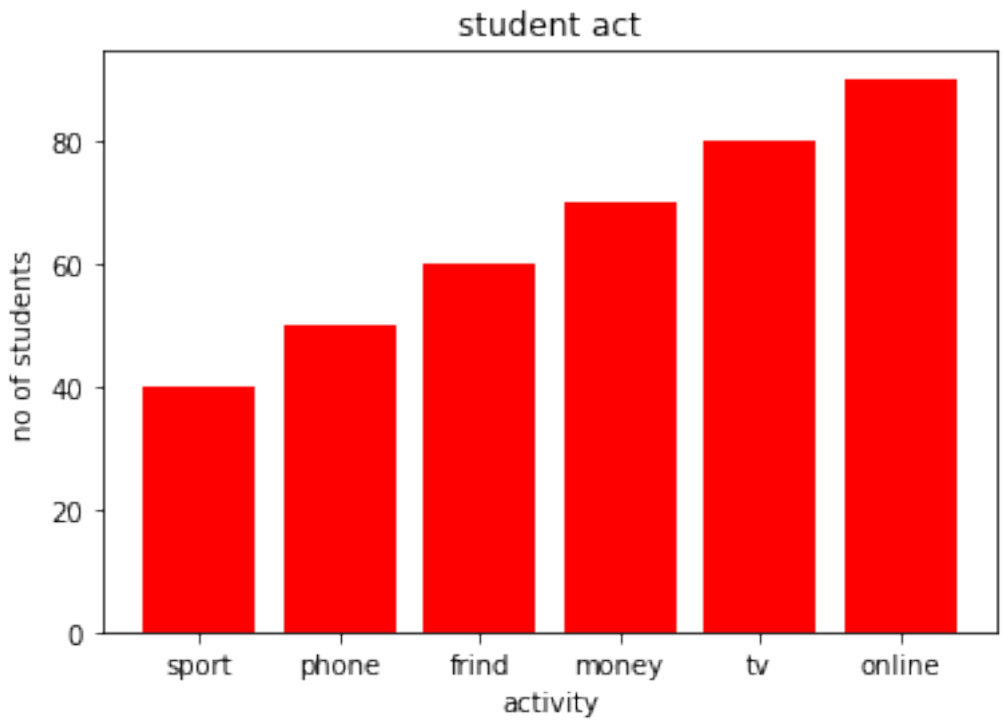


[26]:
```
# barplot
```

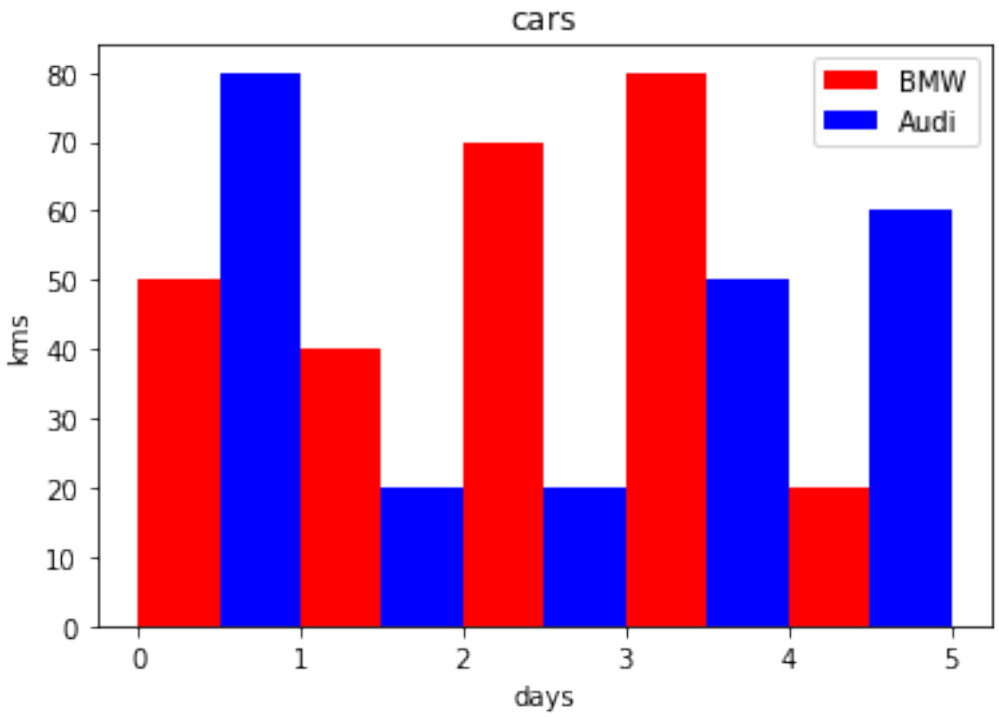
[27]:
```
# horizental
activity=['sport','phone','frind','money','tv','online']
freqency=[40,50,60,70,80,90]

plt.barh(activity,freqency,color='r')
plt.title('student act')
plt.xlabel('activity')
plt.ylabel('no of students')
plt.show()
```



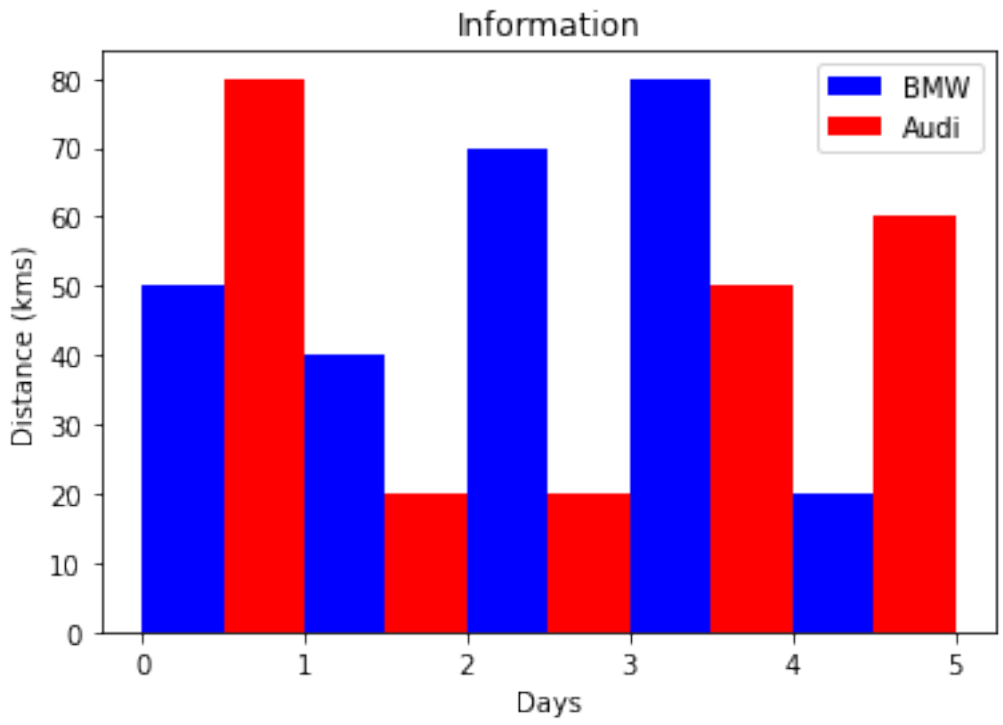
[28]:
```
# vertical
activity=['sport','phone','frind','money','tv','online']
freqency=[40,50,60,70,80,90]

plt.bar(activity,freqency,color='r')
plt.title('student act')
plt.xlabel('activity')
plt.ylabel('no of students')
plt.show()
```



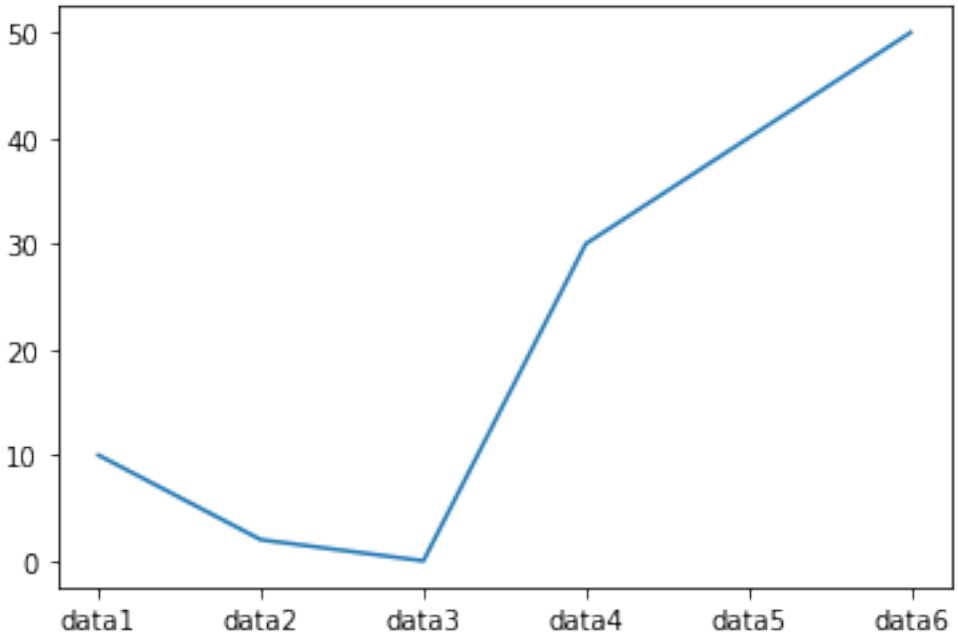
[29]:
```
plt.bar([0.25,1.25,2.25,3.25,4.25],[50,40,70,80,20],
label="BMW", color='r', width=.5)
plt.bar([.75,1.75,2.75,3.75,4.75],[80,20,20,50,60],
label="Audi", color='b', width=.5)
plt.legend()
plt.xlabel('days')
plt.ylabel('kms')
plt.title('cars')
plt.show()
```



[30]:
```
plt.bar([0.25,1.25,2.25,3.25,4.25],[50,40,70,80,20],
label="BMW",color='b',width=.5)
plt.bar([.75,1.75,2.75,3.75,4.75],[80,20,20,50,60],
label="Audi", color='r',width=.5)
plt.legend()
plt.xlabel('Days')
plt.ylabel('Distance (kms)')
plt.title('Information')
plt.show()
```

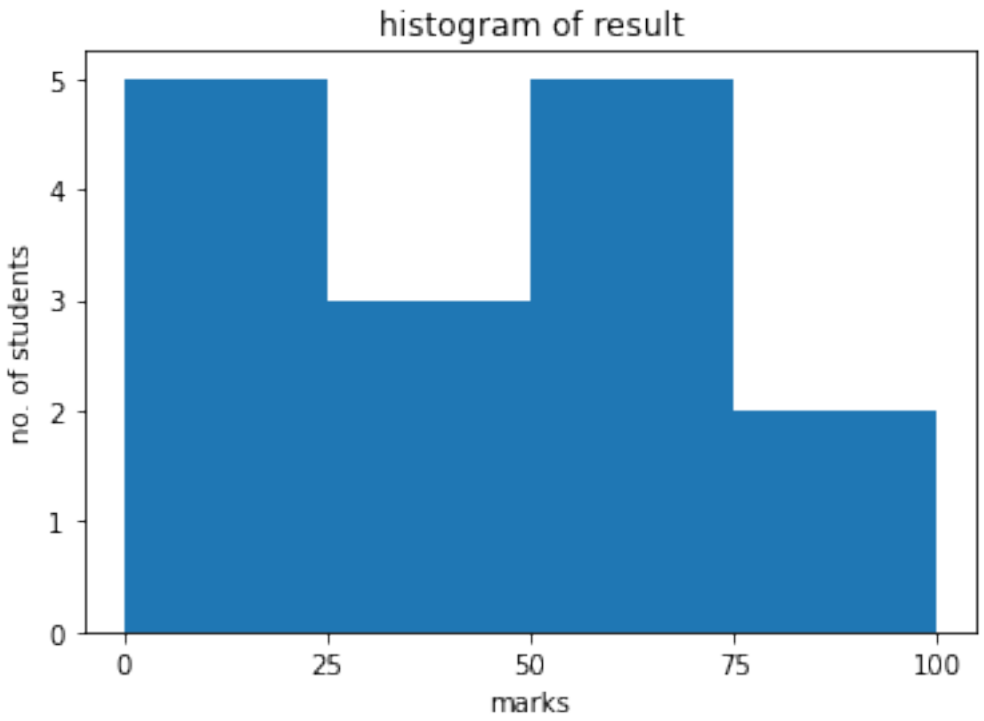


[31]:
```
x=[2,3,4,5,6,7]
y=[10,2,0,30,40,50]
labels=['data1','data2','data3','data4','data5','data6']
plt.plot(x,y)
plt.xticks(x,labels)
plt.show()
```



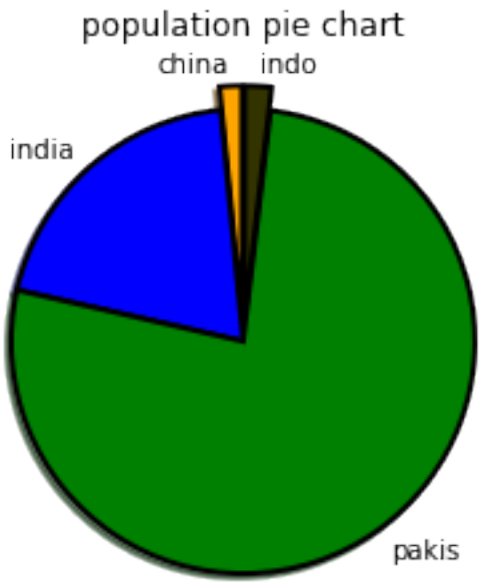
[32]:
```
# histogram plot
```

[33]:
```
fig,ax = plt.subplots(1,1)
a = np.array([22,87,5,43,56,73,55,54,11,20,51,5,79,31,27])
ax.hist(a, bins = [0,25,50,75,100])
ax.set_title("histogram of result")
ax.set_xticks([0,25,50,75,100])
ax.set_xlabel('marks')
ax.set_ylabel('no. of students')
plt.show()
```



[34]:
```
# pieplot
```

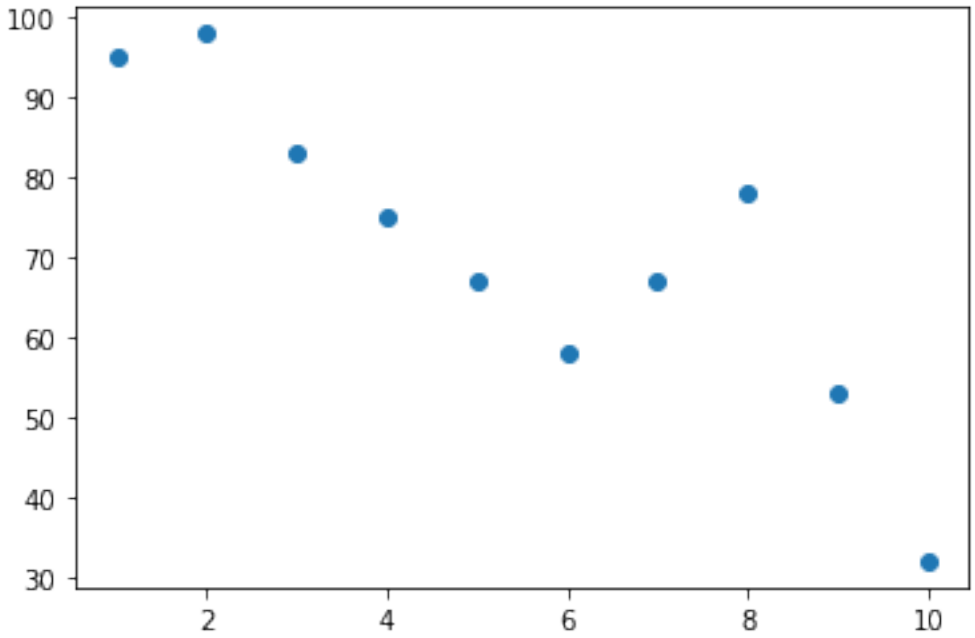
[35]:
```
data=[705437545075,9084571570234,34975179507340,857495389597]
l=['china','india','pakis','indo']
e=[0.1,0.0,0.0,0.1]
colors=['orange', 'blue', 'green','#333300']
plt.pie(data, labels=l, explode=e, shadow=True, startangle=90,
        wedgeprops={'edgecolor':'black', 'linewidth': 2 }, colors=colors)
plt.title('population pie chart')
plt.show()
```



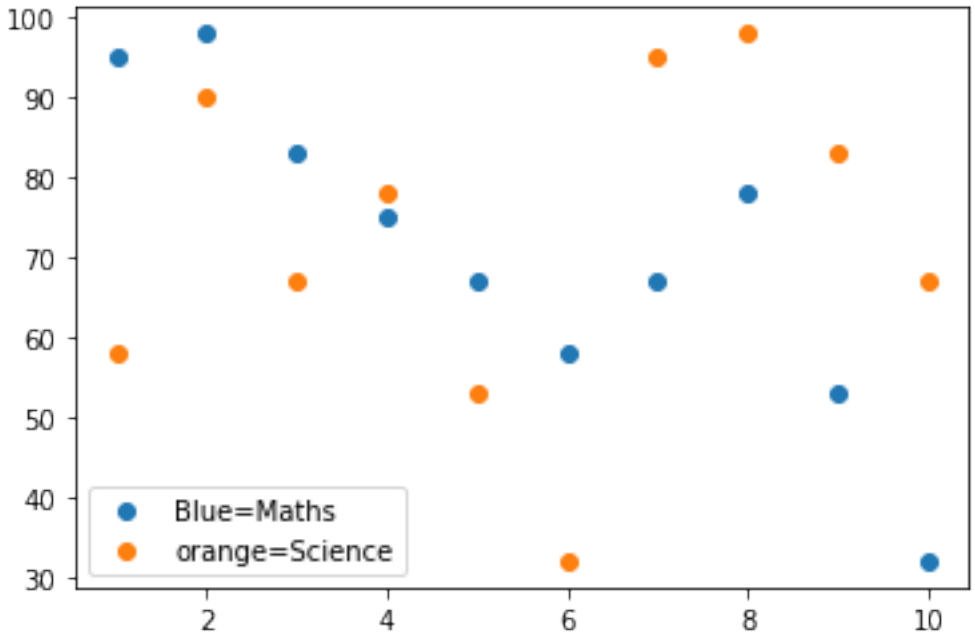
[36]:
```
data = [1433783686, 1366417754, 329064917, 270625568, 216565318 ]

l = ['China', 'India', 'United States', 'Indonesia', 'Pakistan', ]

e = [0.1, 0.0, 0.0, 0.0, 0.1]

colors = ['#ccffcc', 'orange', 'blue', 'green','#333300']

plt.pie(data, labels=l, explode=e, shadow=True, startangle=90,
        wedgeprops={'edgecolor':'black', 'linewidth': 2 }, colors=colors)


plt.title("Population Pie Chart")
plt.show()
```

[37]:
```
# scateer plot
```

[38]:
```
students_id = [1,2,3,4,5,6,7,8,9,10]
students_marks = [95,98,83,75,67,58,67,78,53,32]
plt.scatter(students_id, students_marks)
plt.show()
```



[39]:
```
students_id = np.array([1,2,3,4,5,6,7,8,9,10])
students_marks = np.array([95,98,83,75,67,58,67,78,53,32])
plt.scatter(students_id, students_marks,label='Blue=Maths')

students_id = np.array([1,2,3,4,5,6,7,8,9,10])
students_marks = np.array([58,90,67,78,53,32,95,98,83,67,])
plt.scatter(students_id, students_marks,label='orange=Science')
plt.legend()
plt.show()
```

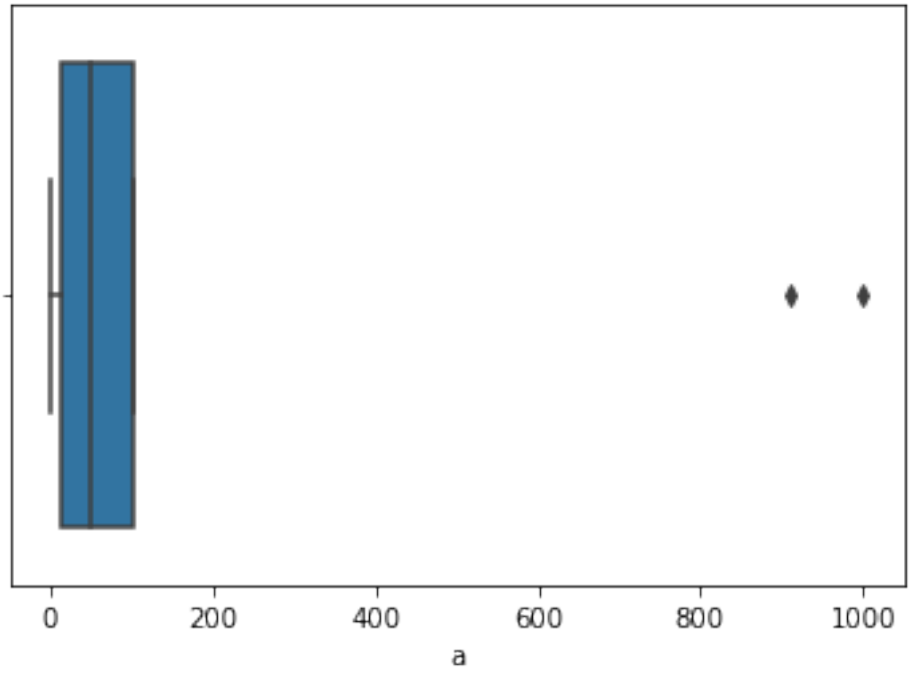


[40]:
```
# box plot()
```

[41]:
```
import seaborn as s
import pandas as pd
l=[0,1,50,60,50,14,909,1000,101]
df=pd.DataFrame(l,columns=['a'])
df
s.boxplot(df['a'])
```

```
D:\anakonda\lib\site-packages\seaborn\_decorators.py:36: FutureWarning: Pass the
following variable as a keyword arg: x. From version 0.12, the only valid
positional argument will be `data`, and passing other arguments without an
explicit keyword will result in an error or misinterpretation.
  warnings.warn(
```

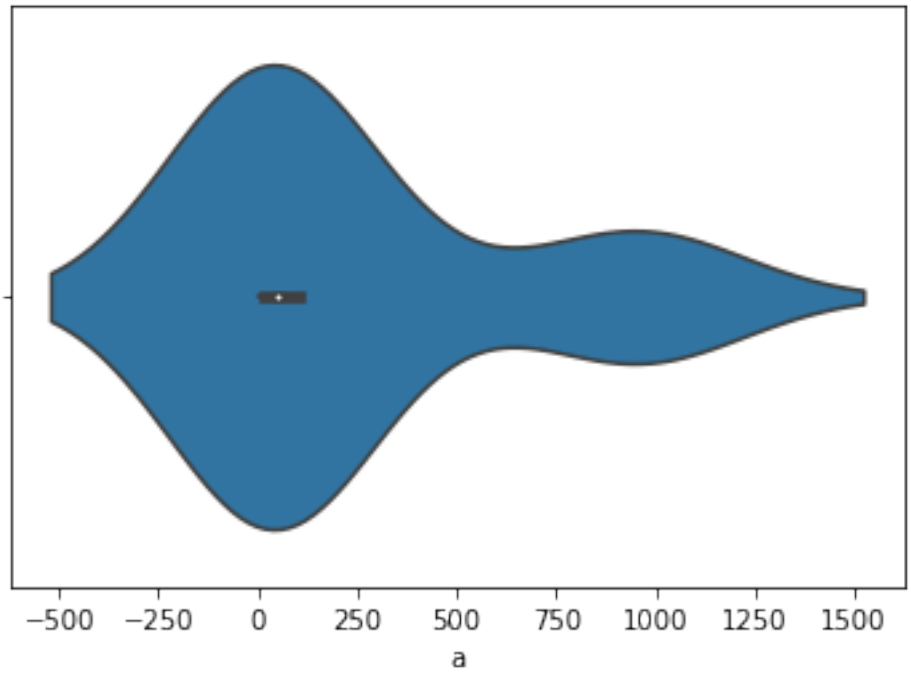
[41]: <AxesSubplot:xlabel='a'>



[42]:
```
s.violinplot(df['a'])
```

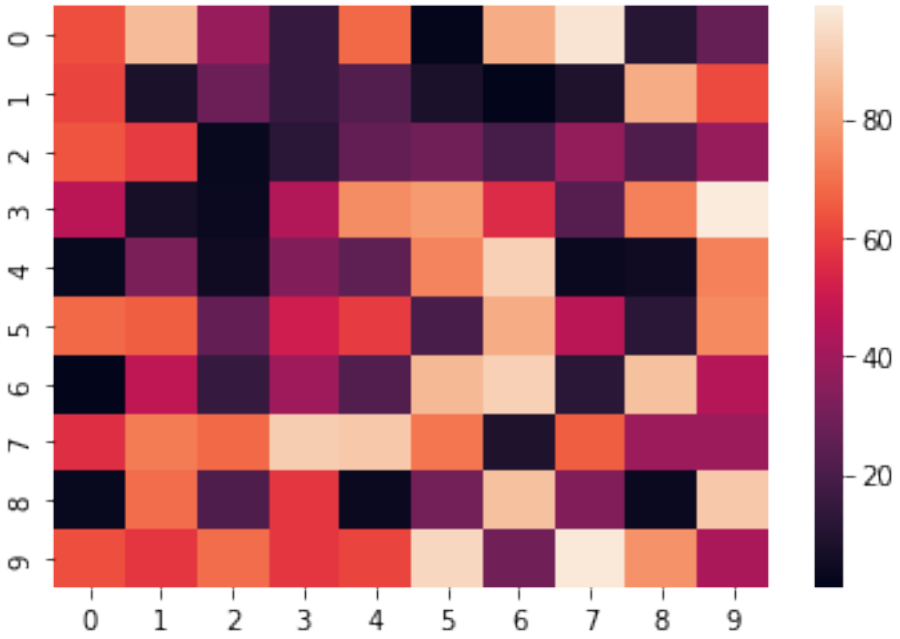
```
D:\anakonda\lib\site-packages\seaborn\_decorators.py:36: FutureWarning: Pass the
following variable as a keyword arg: x. From version 0.12, the only valid
positional argument will be `data`, and passing other arguments without an
explicit keyword will result in an error or misinterpretation.
  warnings.warn(
```

[42]: <AxesSubplot:xlabel='a'>



[46]:
```
data = np.random.randint(low = 1,high = 100,size = (10, 10))
print("The data to be plotted:\n")
print(data)
# plotting the heatmap
hm = sn.heatmap(data = data)

# displaying the plotted heatmap
plt.show()
```

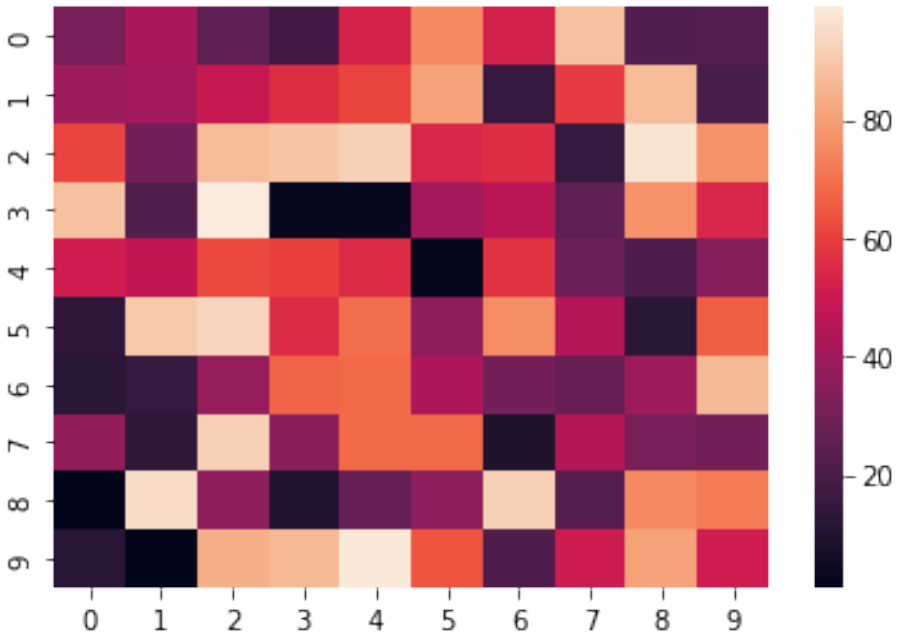
```
The data to be plotted:

[[63 87 38 15 68  2 83 97 11 27]
 [61  8 28 15 22  8  1  9 83 62]
 [64 59  3 12 26 29 19 37 21 38]
 [46  7  4 44 76 79 55 23 73 99]
 [ 3 32  5 33 25 74 92  4  5 73]
 [68 66 26 51 59 20 83 46 12 75]
 [ 1 47 15 40 22 86 92 12 88 45]
 [56 72 68 91 90 71  9 66 39 39]
 [ 3 69 21 58  4 30 88 33  4 90]
 [63 58 69 58 61 94 29 98 77 42]]
```



[45]:
```
# importing the modules
import numpy as np
import seaborn as sn
import matplotlib.pyplot as plt

# generating 2-D 10x10 matrix of random numbers
# from 1 to 100
data = np.random.randint(low = 1,high = 100,size = (10, 10))
print("The data to be plotted:\n")
print(data)

# plotting the heatmap
hm = sn.heatmap(data = data)

# displaying the plotted heatmap
plt.show()
```

```
The data to be plotted:

[[31 42 25 18 53 75 52 88 22 23]
 [39 41 49 56 61 81 15 59 87 20]
 [61 30 87 89 92 54 56 15 97 77]
 [88 22 99  3  3 41 46 25 77 54]
 [51 48 62 60 55  2 57 28 21 34]
 [13 90 93 55 69 36 76 45 12 66]
 [12 15 38 67 68 43 30 27 39 86]
```

```
[37 13 92 35 68 68  9 45 31 30]
[ 1 95 36 10 27 36 92 23 75 72]
[12  1 84 86 98 64 21 50 81 51]]
```



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