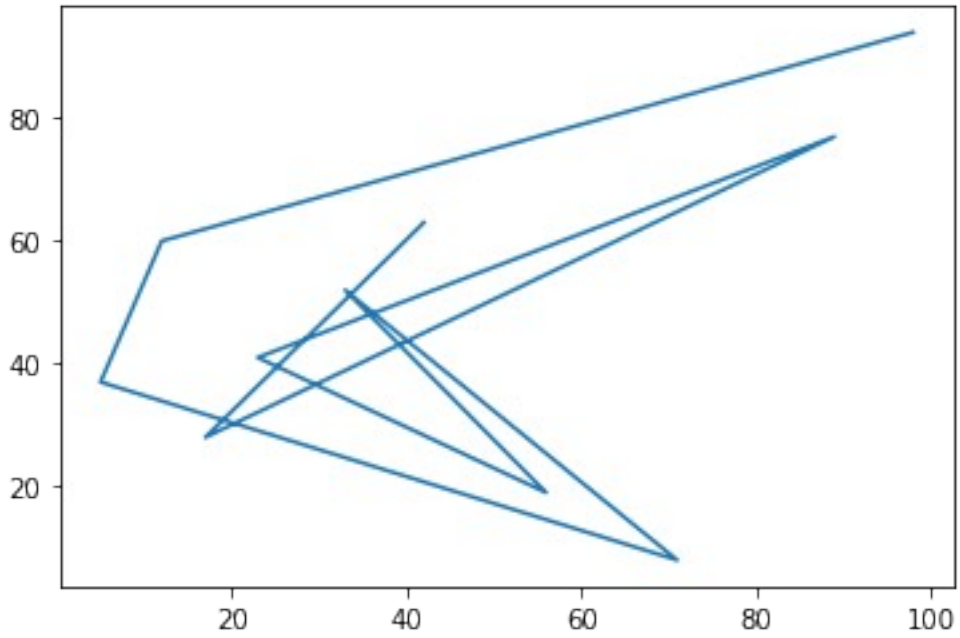
MATPLOTLIB

method 1 :

without arrays

```
import matplotlib.pyplot as plt
import numpy as np

x = [42, 17, 89, 23, 56, 33, 71, 5, 12, 98]
y = [63, 28, 77, 41, 19, 52, 8, 37, 60, 94]

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

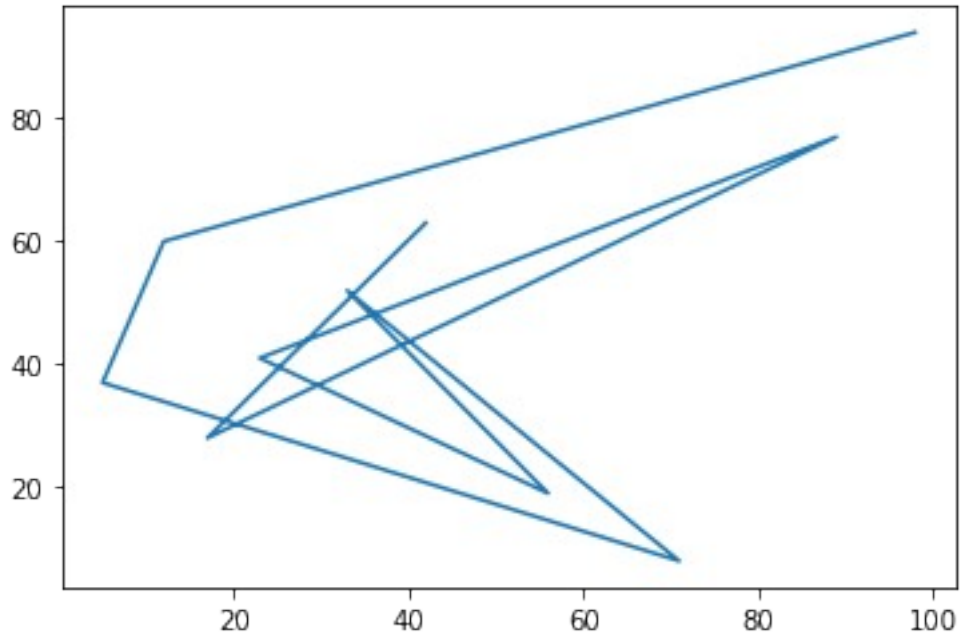


method 2 :

with arrays

```
import matplotlib.pyplot as plt
import numpy as np

x = np.array([42, 17, 89, 23, 56, 33, 71, 5, 12, 98])
y = np.array([63, 28, 77, 41, 19, 52, 8, 37, 60, 94])
```

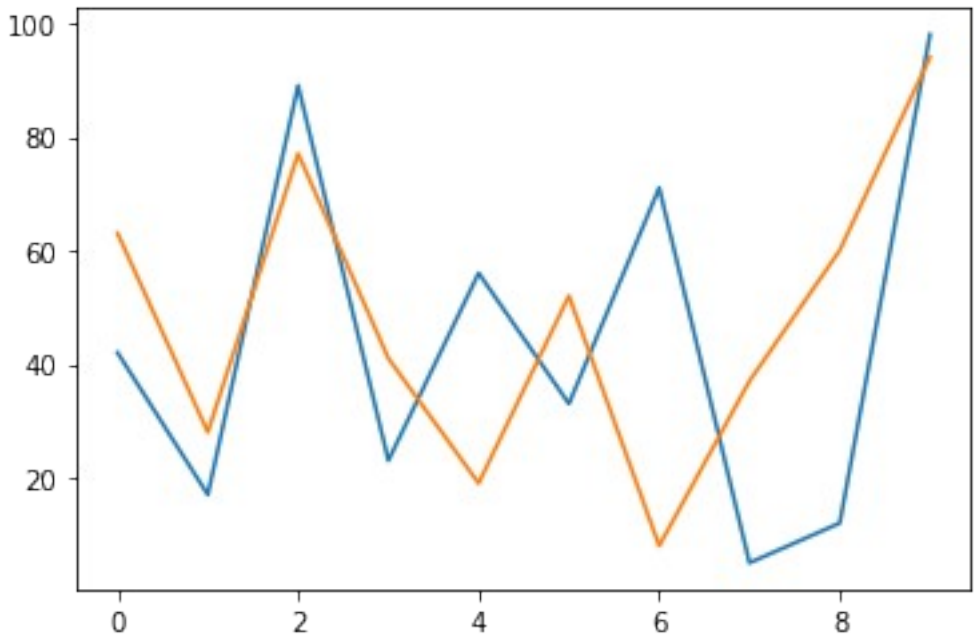
```
plt.plot(x,y)
plt.show()
```



this are with x & y together

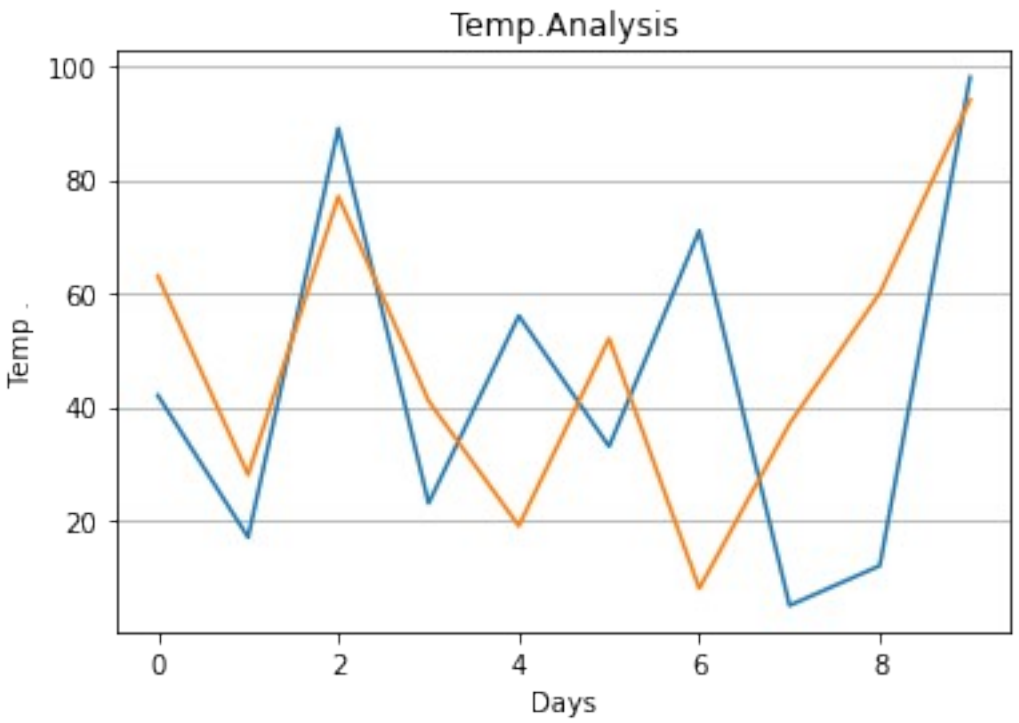
With x & y separate

```
import matplotlib.pyplot as plt
import numpy as np

x = np.array([42, 17, 89, 23, 56, 33, 71, 5, 12, 98])
y = np.array([63, 28, 77, 41, 19, 52, 8, 37, 60, 94])

plt.plot(x)
plt.plot(y)
print(type(x))
plt.show()

<class 'numpy.ndarray'>
```



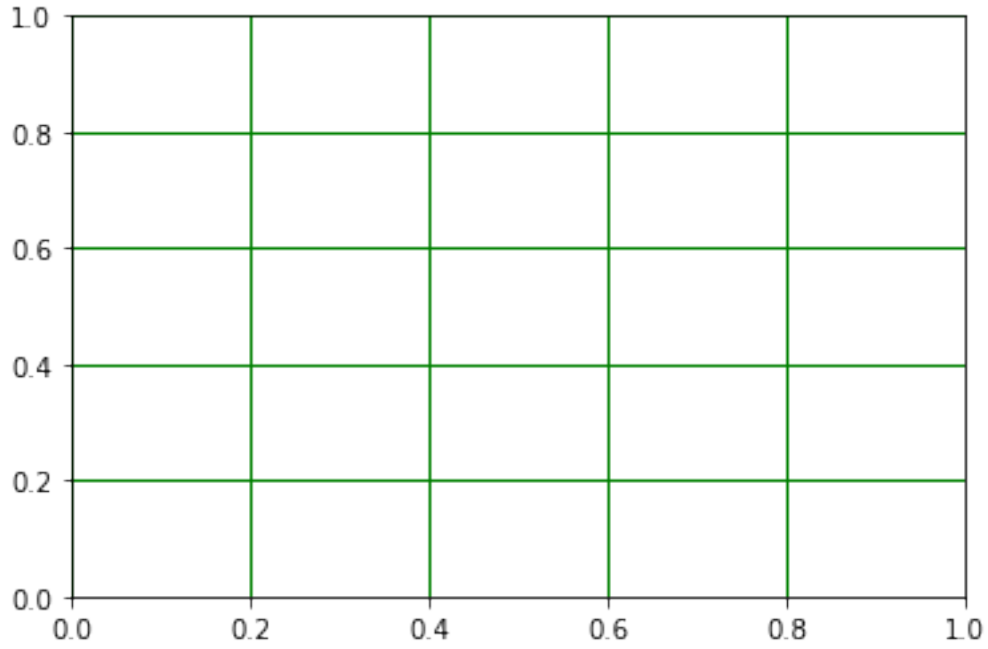
Adding titles, x-y labels grids

```
plt.plot(x)
plt.plot(y)
plt.title("Temp.Analysis")
plt.xlabel("Days")
plt.ylabel(" Temp . ")
plt.grid(axis=)
plt.show()
```



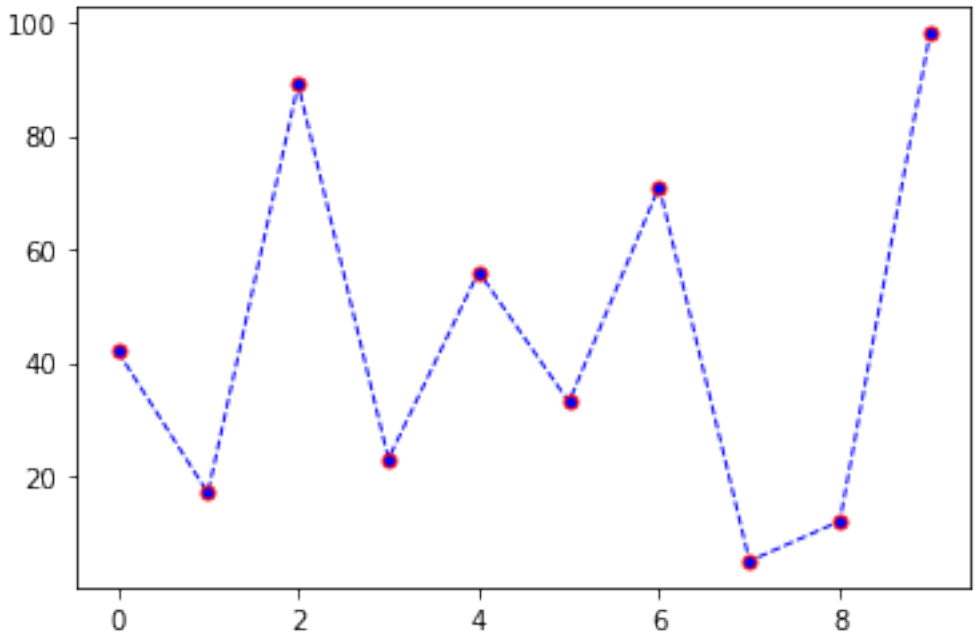
grid properties

```
plt.grid( color='green',linestyle='-',linewidth=1)
plt.show()
```



Add markers,markersize, color, linewidth, linestyle, outline to markers

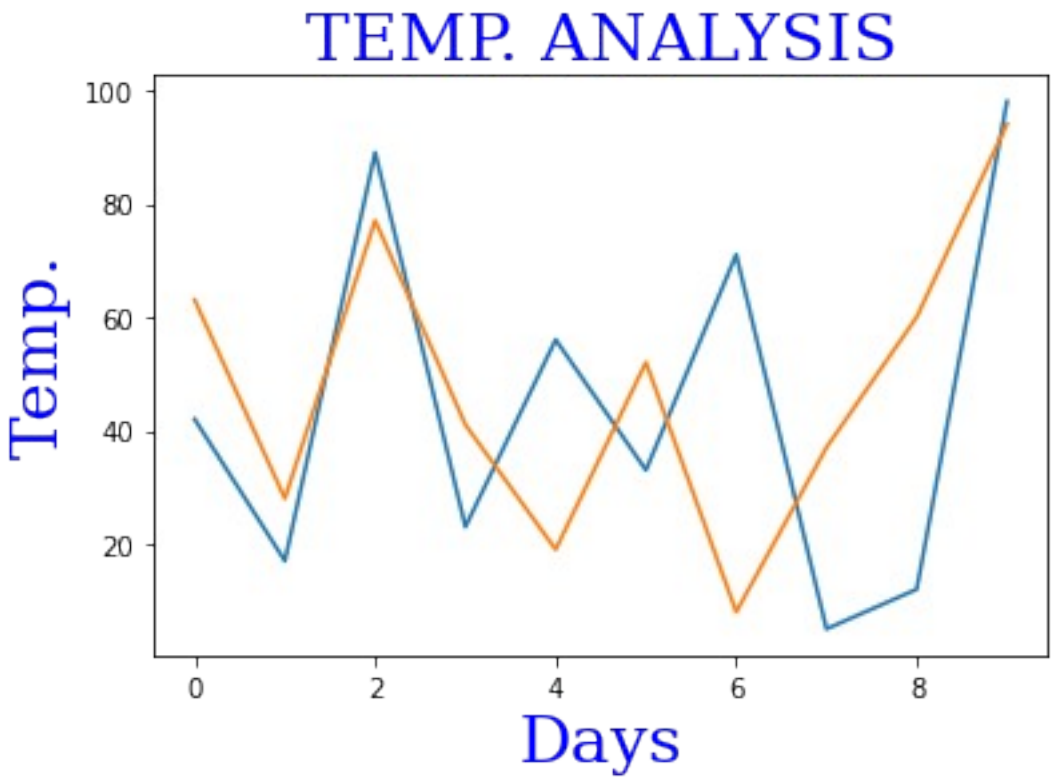
```
import matplotlib.pyplot as plt
import numpy as np

x = np.array([42, 17, 89, 23, 56, 33, 71, 5, 12, 98])


plt.plot(x,marker
='o',markersize=5,color='blue',linewidth=1,linestyle="dashed",mec="red
")


plt.show()
```



properties of labels

```
import matplotlib.pyplot as plt
import numpy as np

x = np.array([42, 17, 89, 23, 56, 33, 71, 5, 12, 98])
y = np.array([63, 28, 77, 41, 19, 52, 8, 37, 60, 94])


font1={'family':'serif','color':'blue','size':25}
font2={'family':'serif','color':'blue','size':25}
```

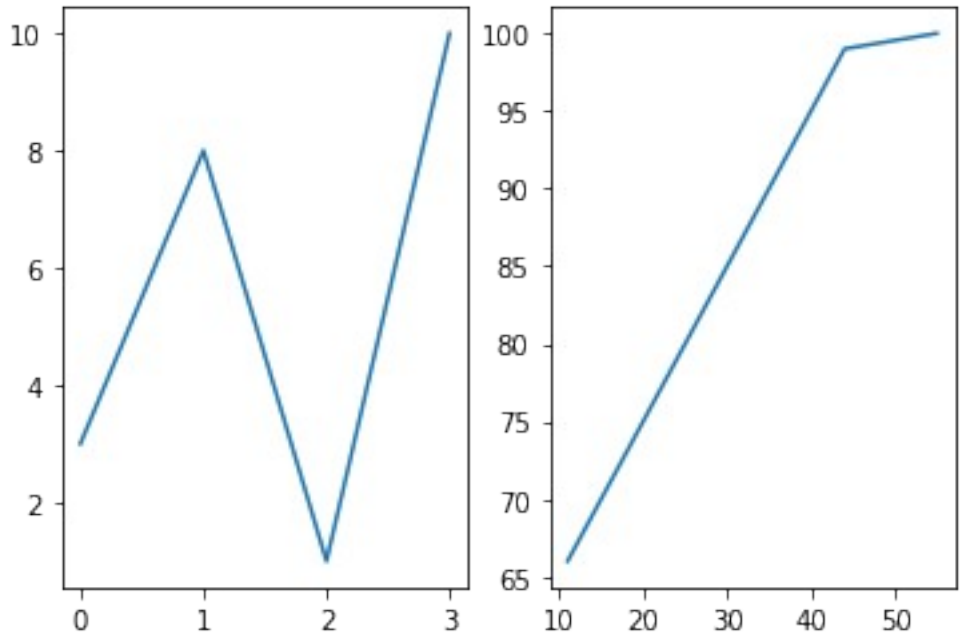
```
plt.title('TEMP. ANALYSIS',fontdict=font1)
plt.xlabel('Days',fontdict=font2)
plt.ylabel(' Temp.',fontdict=font2)
plt.plot(x)
plt.plot(y)

plt.show()
```



Subplots

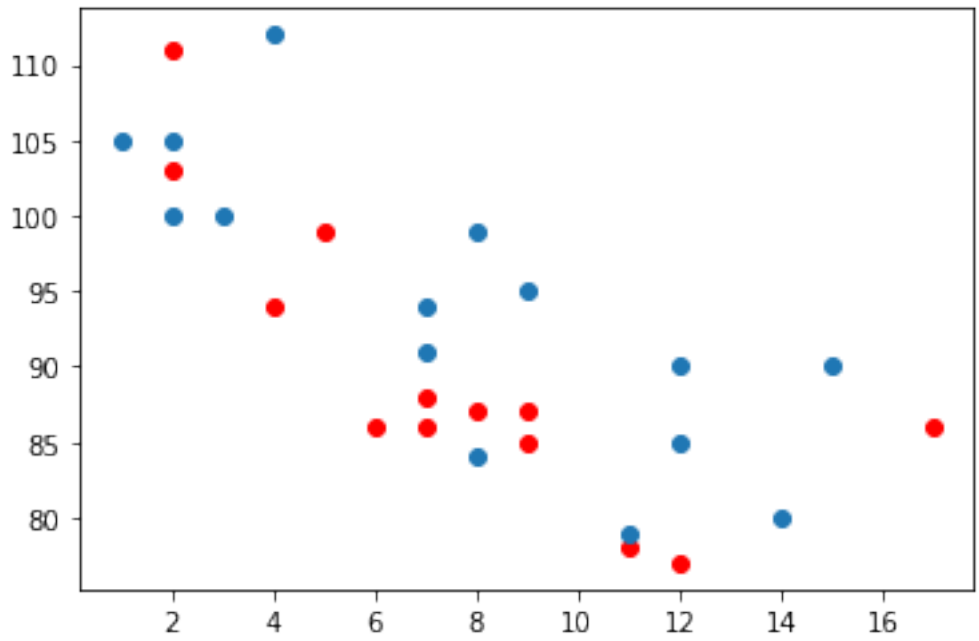
```
x = np.array([0, 1, 2, 3])
y = np.array([3, 8, 1, 10])

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



x = np.array([11, 22, 33, 44, 55])
```

```
y = np.array([66, 77, 88, 99, 100])

plt.subplot(1,2,2)
plt.plot(x,y)
plt.show()  # subplot ->  plot -> show
```



Scatter Plots

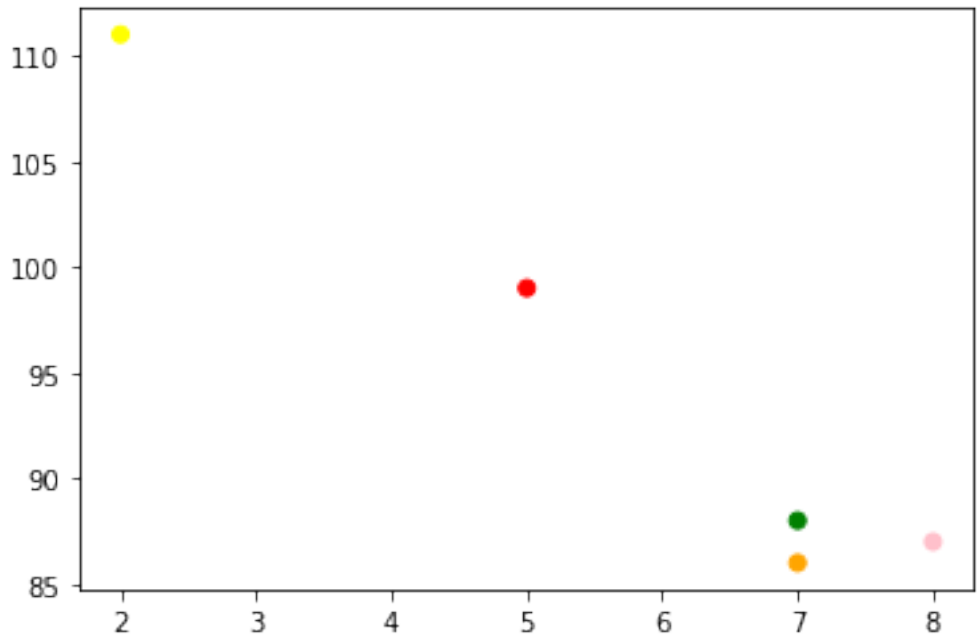
```
x = np.array([5,7,8,7,2,17,2,9,4,11,12,9,6])
y = np.array([99,86,87,88,111,86,103,87,94,78,77,85,86])
plt.scatter(x, y,color='red')  #instead of using plt.plot() we use
plt.scatter()   & also used color function


x = np.array([2,2,8,1,15,8,12,9,7,3,11,4,7,14,12])
y = np.array([100,105,84,105,90,99,90,95,94,100,79,112,91,80,85])
plt.scatter(x, y)

<matplotlib.collections.PathCollection at 0x2bc2bedf9d0>
```



color each dots

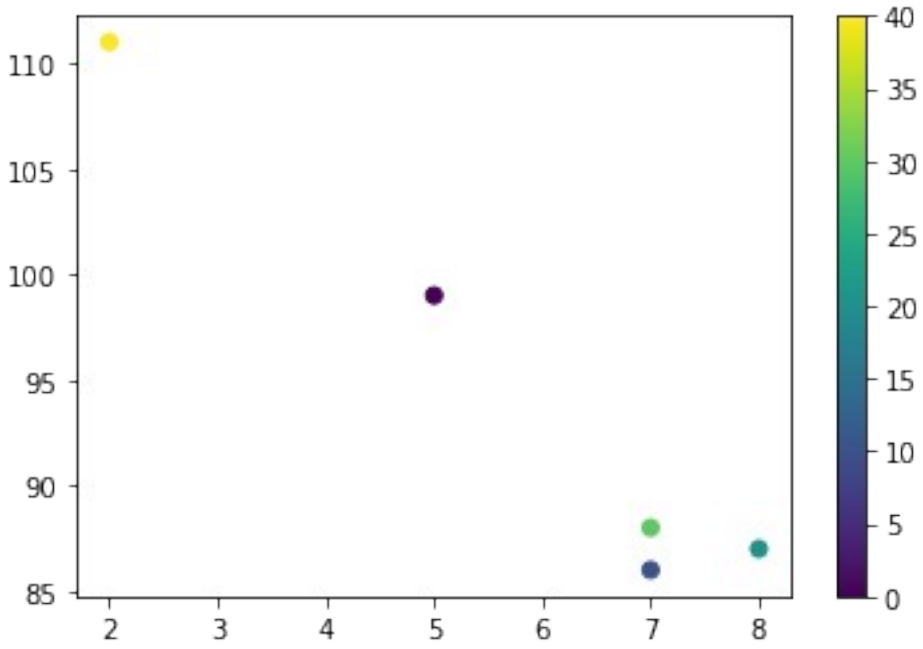
```
x = np.array([5,7,8,7,2])
y = np.array([99,86,87,88,111])
colors = (['red','orange','pink','green','yellow'])
plt.scatter(x,y,c=colors)
```

```
<matplotlib.collections.PathCollection at 0x2bc2bf535e0>
```



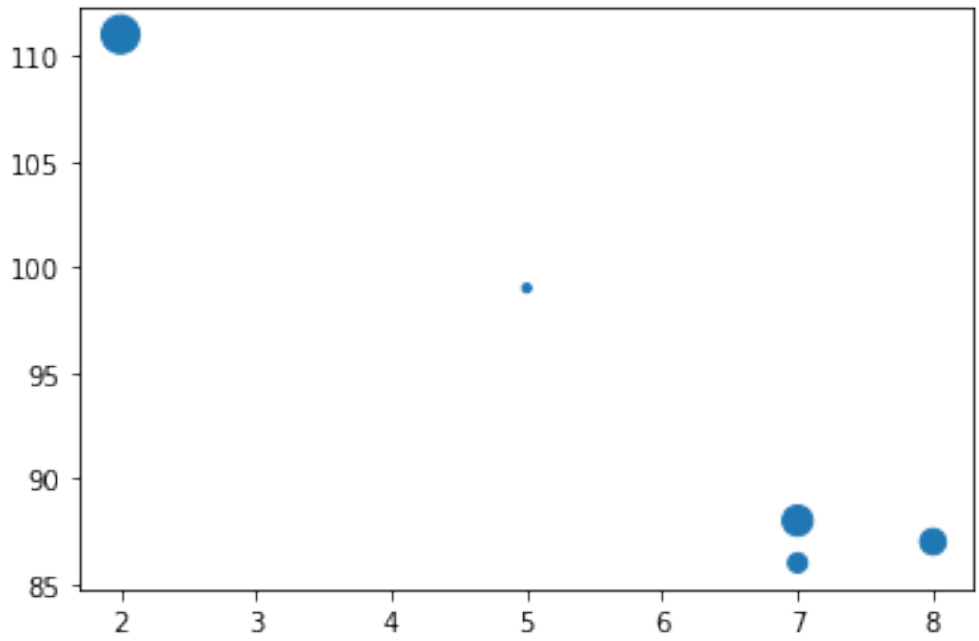
color map

```
# cmap= 'viridis' & create array
x = np.array([5,7,8,7,2])
y = np.array([99,86,87,88,111])

colors = ([0,10,20,30,40])
plt.scatter(x,y,c=colors,cmap='viridis')
plt.colorbar()
plt.show()
```



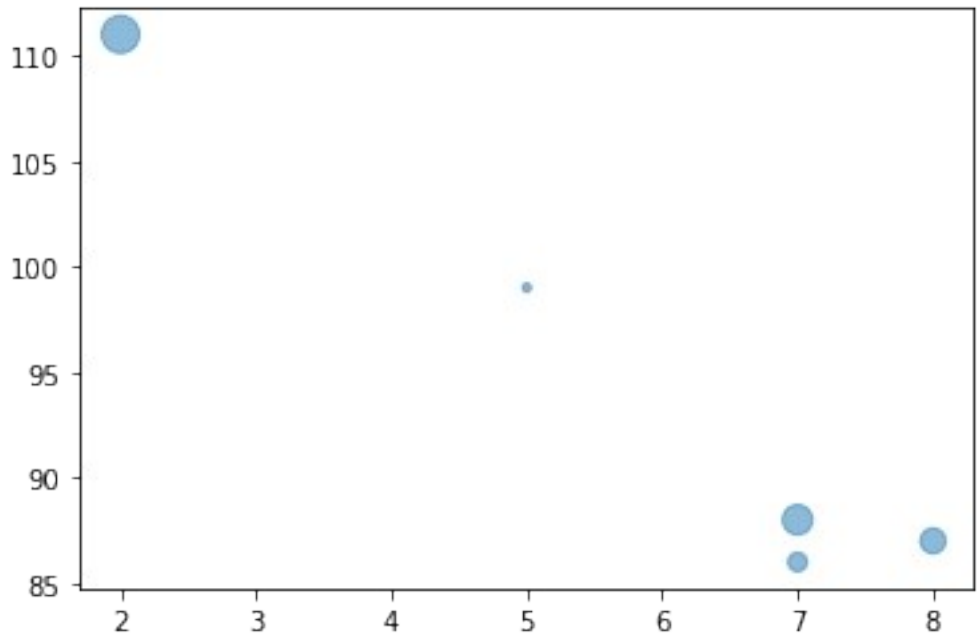
sizes for points

```

x = np.array([5,7,8,7,2])
y = np.array([99,86,87,88,111])

sizes = ([10,50,90,125,199])
plt.scatter(x,y,s=sizes)

plt.show()
```



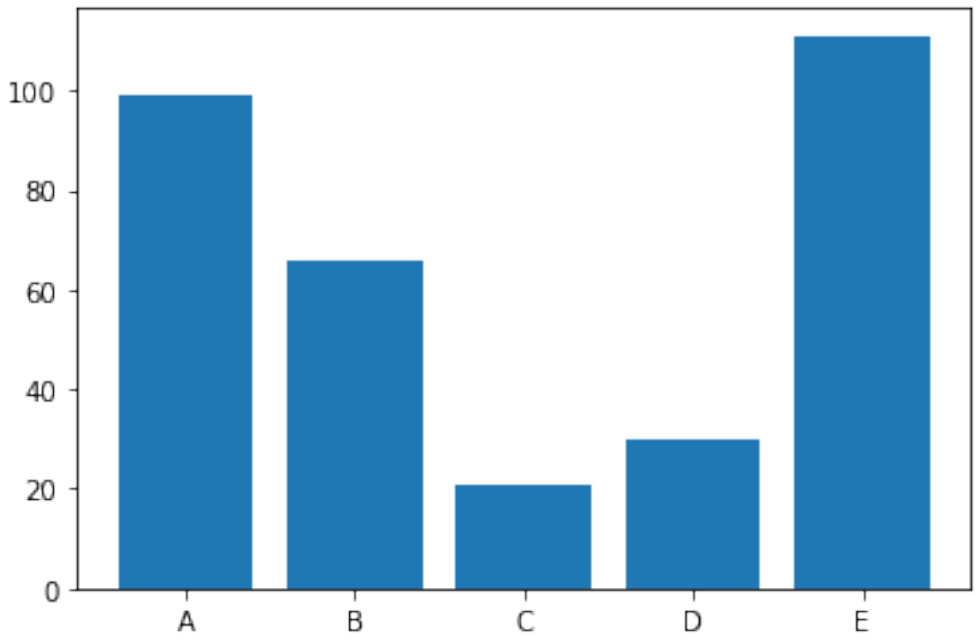
sizes for points with alpha function

```
x = np.array([5,7,8,7,2])
y = np.array([99,86,87,88,111])

sizes = ([10,50,90,125,199])
plt.scatter(x,y,s=sizes,alpha=0.5)

plt.show()
```



Bars

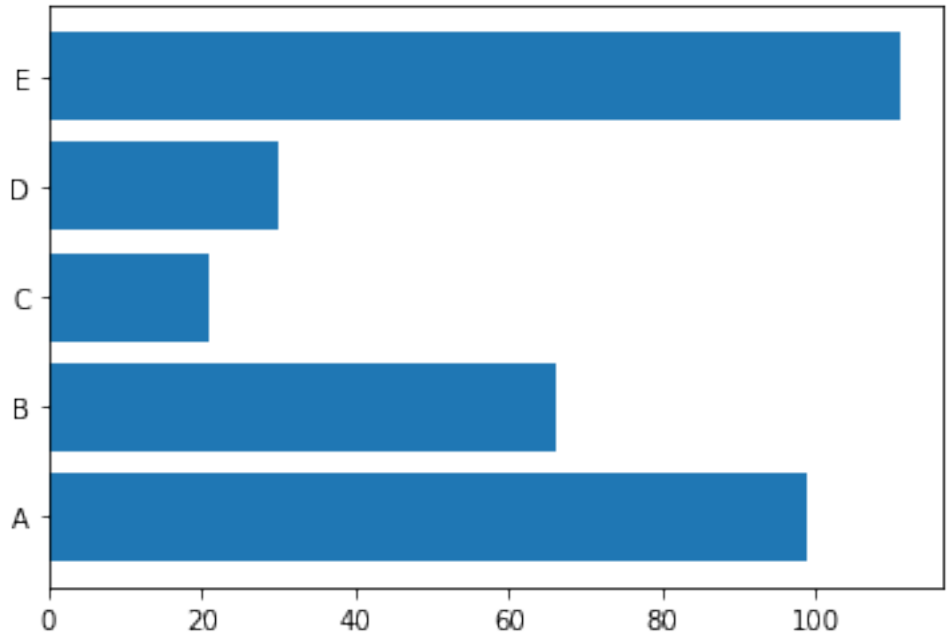
```
x = np.array(['A','B','C','D','E'])
y = np.array([99,66,21,30,111])

plt.bar(x,y)

plt.show()
```



bar function

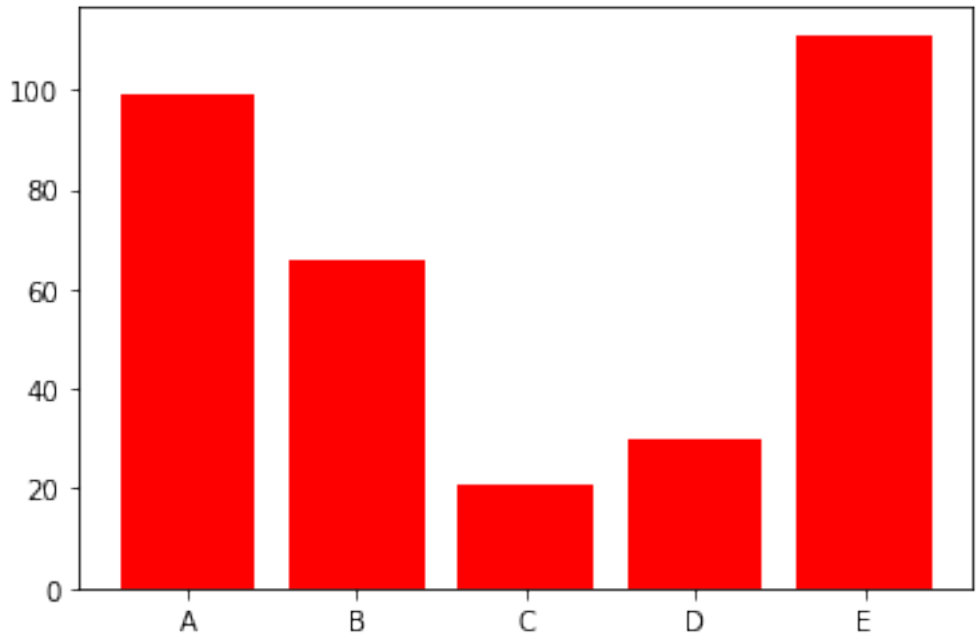
```
plt.barh(x,y)
```

```
<BarContainer object of 5 artists>
```



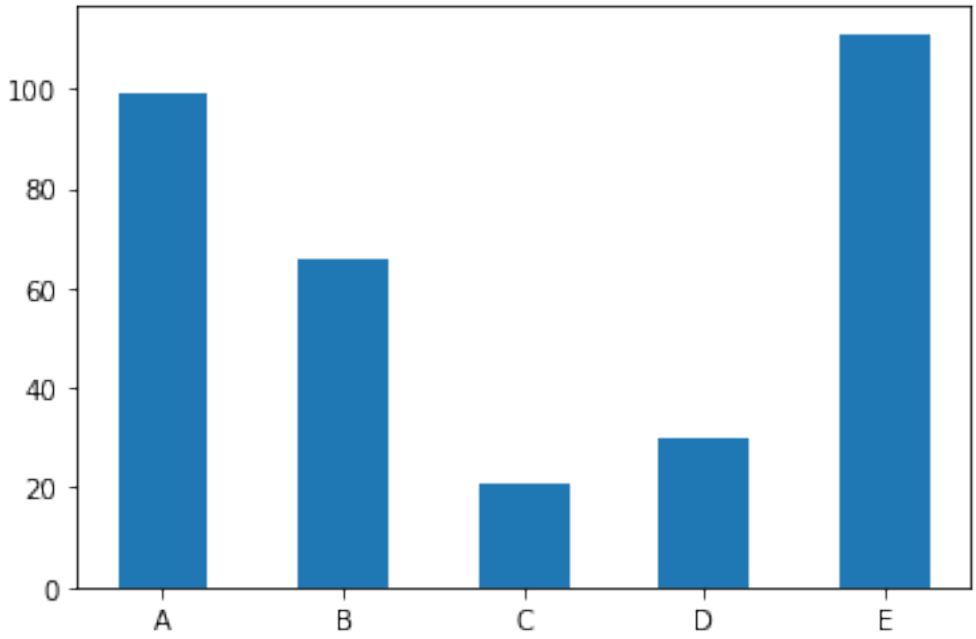

```
plt.bar(x,y,color = 'red')
```

```
<BarContainer object of 5 artists>
```




```
plt.bar(x,y, width = 0.5)
```

```
<BarContainer object of 5 artists>
```



plt.barh(x,y, height = 0.5)

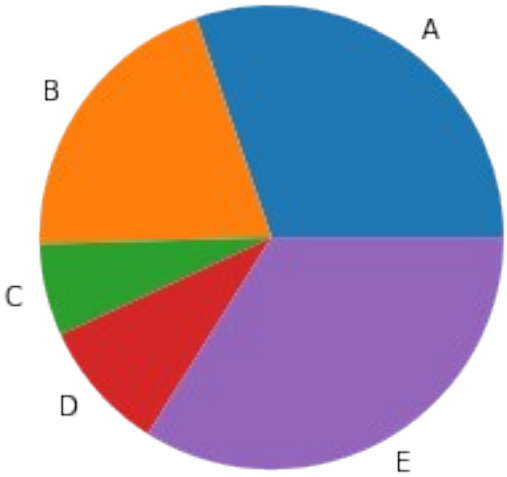
Histogram

```
# IT REQUIRES KNOWLEDGE OF STANDARD DEVIATION ETC.
```

Pie Charts

```
y = np.array([99,66,21,30,111])
plt.pie(y)
plt.show()
```

```
mylabels = ['A','B','C','D','E']              #labels
plt.pie(y,labels=mylabels)
plt.show()
```



pie chart explode

```
y = np.array([99,66,21,30,111])
mylabels = ['A','B','C','D','E']

myexplode = [0.2,0,0,0,0]

plt.pie(y,labels=mylabels,explode = myexplode, shadow = True)
```

```
plt.legend(title = 'ANALYSIS')
plt.show()
```