

Matplotlib

Matplotlib is a plotting library for the Python programming language and its numerical mathematics extension Numpy

some of the major pros of Matplotlib are:

-*Generally easy to get started for simple plots*

-*Support for custom labels and texts*

-*Great control of every element in figure*

-*High-quality output in many formats*

-*Very customizable in general*

Importing the libraries

```
In [1]: 1 import numpy as np
         2 import pandas as pd
         3 import matplotlib.pyplot as plt
         4 %matplotlib inline
```

Preparing random dataset

```
In [2]: 1 d={'Length':np.random.randn(500)}
```

```
In [3]: 1 df=pd.DataFrame(d)
```

```
In [4]: 1 df.head()
```

Out[4]:

	Length
0	0.329207
1	-0.659560
2	-0.063068
3	-0.618620
4	0.393730

```
In [5]: 1 df.shape
```

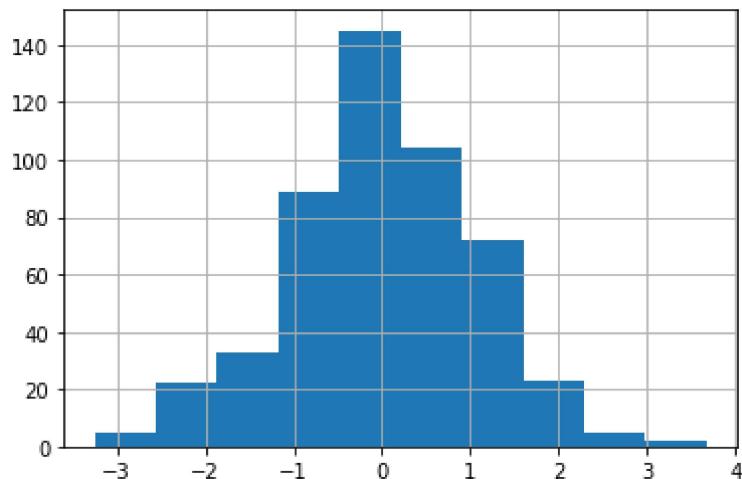
Out[5]: (500, 1)

Histogram

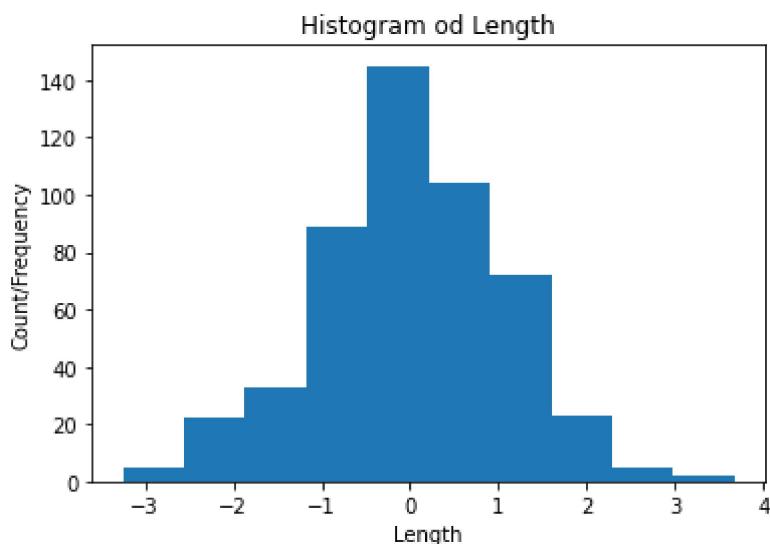
In histogram, x axis contains a variable and y will be a frequency of that variable

In [6]: 1 df['Length'].hist()

Out[6]: <AxesSubplot:>



In [7]: 1 plt.hist(df['Length'])# 10 bins by default
2 plt.xlabel('Length')# Set the Label for x-axis
3 plt.ylabel('Count/Frequency')#Set the Label for x-axis
4 plt.title('Histogram od Length')
5 plt.show()



In [8]: 1 a={'lenth':np.random.randn(500)}

In [9]: 1 a=pd.DataFrame(a)

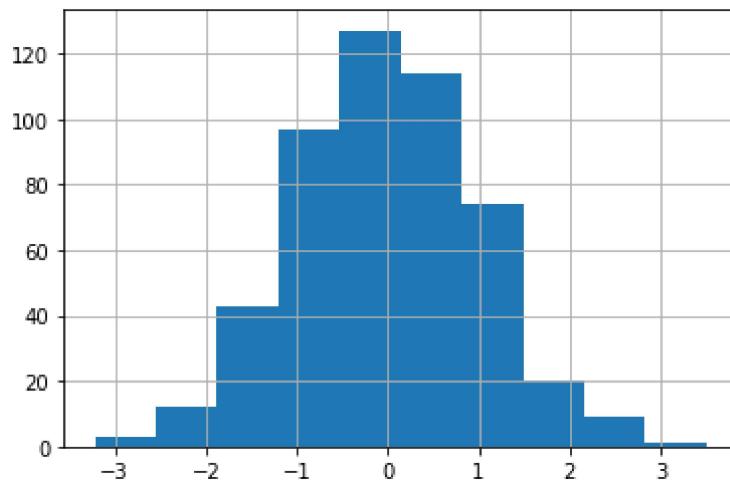
```
In [10]: 1 a.head()
```

Out[10]:

	length
0	0.399434
1	-1.275517
2	0.182991
3	0.267921
4	-0.819822

```
In [11]: 1 a['length'].hist()
```

Out[11]: <AxesSubplot:>



```
In [12]: 1 a={'Length':np.random.randn(250)}
```

```
In [13]: 1 df=pd.DataFrame(a)
2 df.head()
```

Out[13]:

	Length
0	-1.461581
1	-0.650914
2	0.104564
3	-0.072485
4	1.216828

In [14]: 1 df

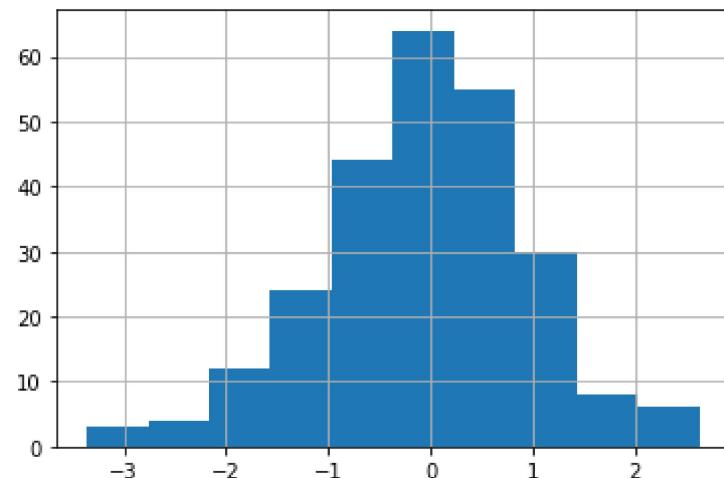
Out[14]:

	Length
0	-1.461581
1	-0.650914
2	0.104564
3	-0.072485
4	1.216828
...	...
245	0.684862
246	-2.054730
247	-0.967740
248	-0.050831
249	-0.462373

250 rows × 1 columns

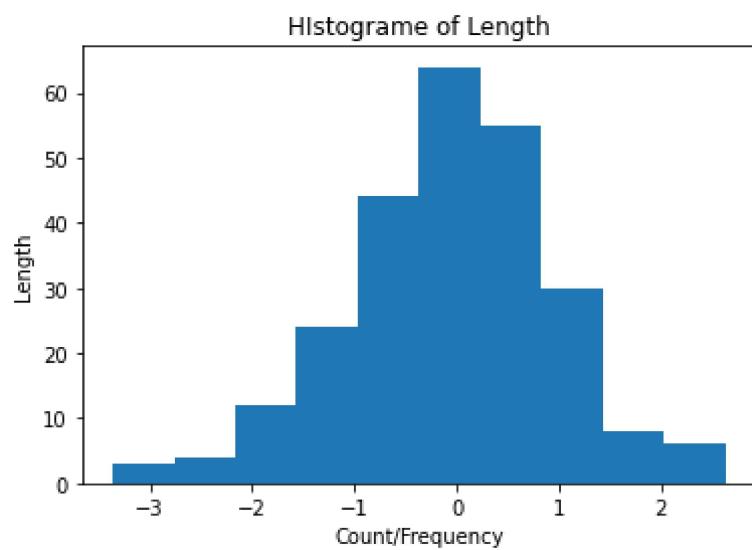
In [15]: 1 df['Length'].hist()

Out[15]: <AxesSubplot:>



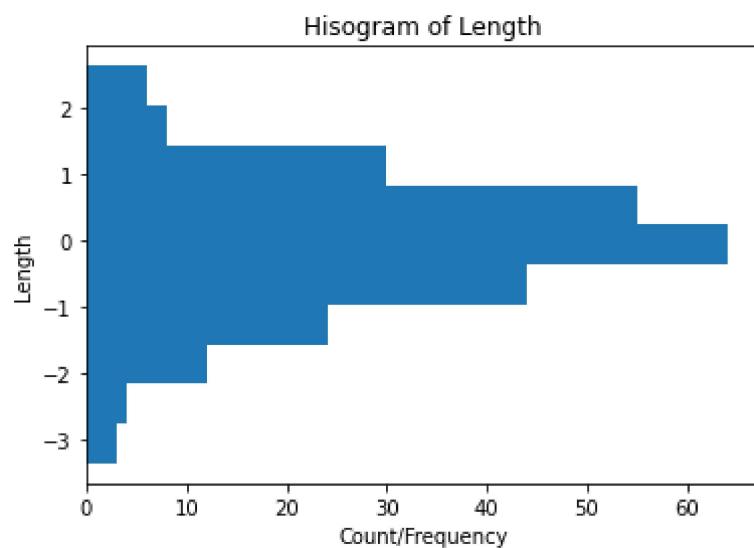
In [16]:

```
1 plt.hist(df['Length'])  
2 plt.xlabel('Count/Frequency')  
3 plt.ylabel('Length')  
4 plt.title('Histogram of Length')  
5 plt.show()
```



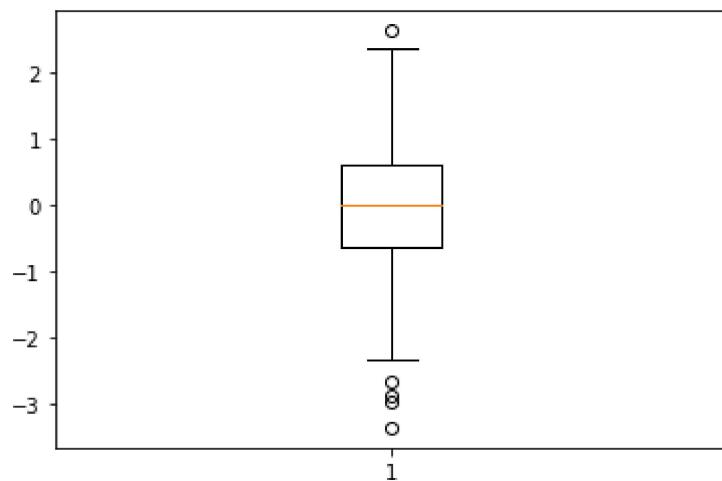
In [17]:

```
1 plt.hist(df['Length'], orientation='horizontal')#Horizontal orientation  
2 plt.xlabel('Count/Frequency')  
3 plt.ylabel('Length')  
4 plt.title('Hisogram of Length')  
5 plt.show()
```



Box plot

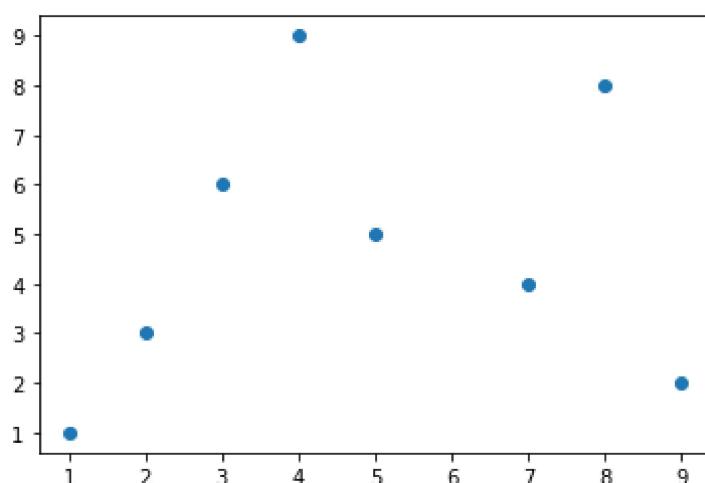
```
In [18]: 1 plt.boxplot(df['Length'])  
2 plt.show()
```



```
In [19]: 1 a=[1,2,3,5,9,7,8,4]
```

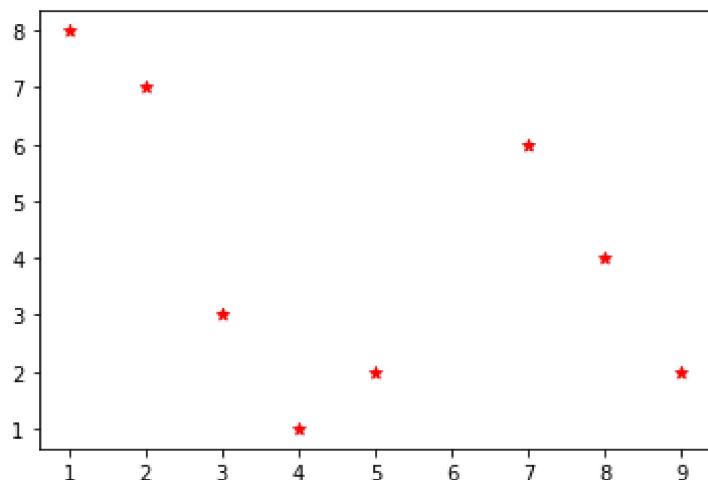
Scatter Plot

```
In [20]: 1 b=[1,3,6,5,2,4,8,9]  
2 plt.scatter(a,b)  
3 plt.show()
```



In [21]:

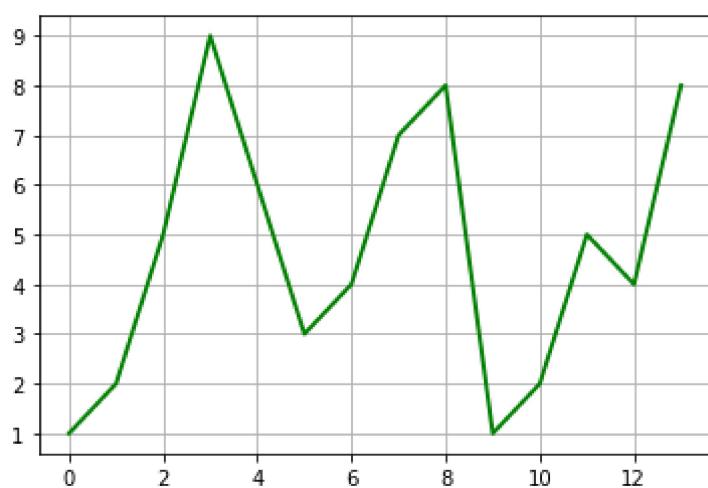
```
1 x=[4,5,3,8,1,2,7,9]
2 y=[1,2,3,4,8,7,6,2]
3 plt.scatter(x,y,c='red',marker='*')
4 plt.show()
```



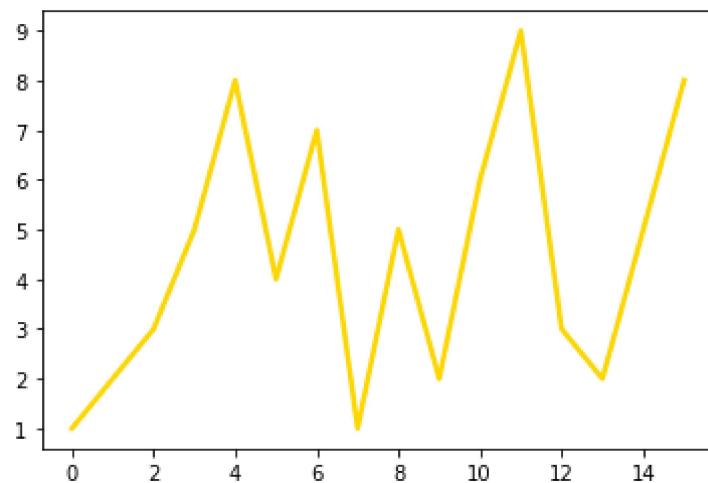
Line Plot

In [22]:

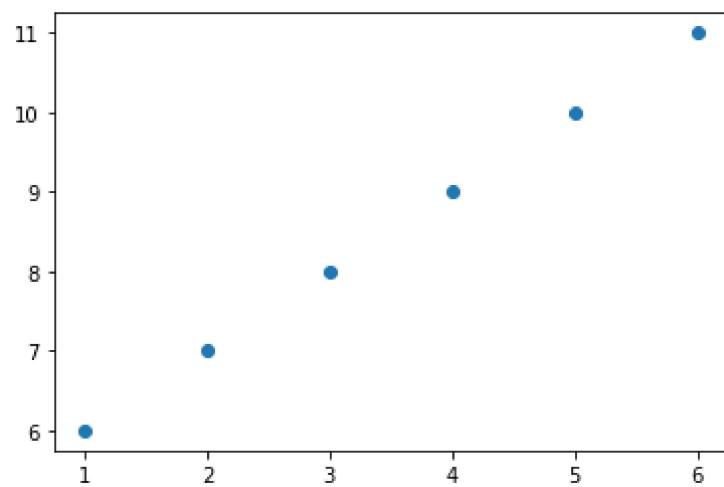
```
1 y=[1,2,5,9,6,3,4,7,8,1,2,5,4,8]
2 plt.plot(y,c='green',linewidth=2.0)
3 plt.grid()
4 plt.show()
```



```
In [23]: 1 new=[1,2,3,5,8,4,7,1,5,2,6,9,3,2,5,8]
          2 plt.plot(new,c='gold',linewidth=2.5)
          3 plt.show()
```



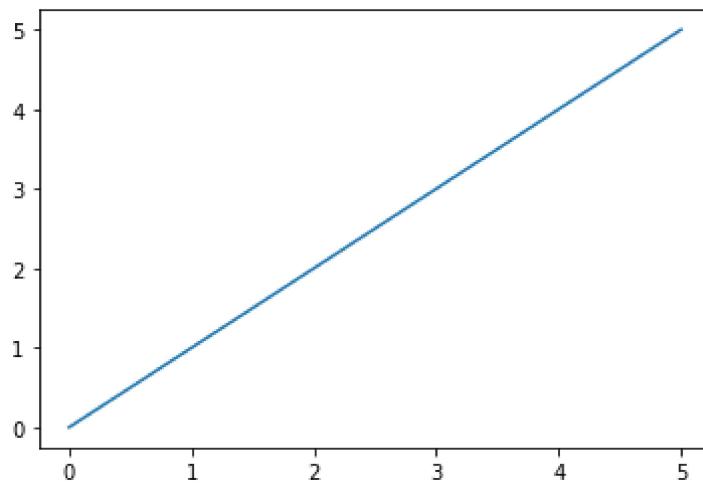
```
In [24]: 1 x=[1,2,3,4,5,6]
          2 y=[6,7,8,9,10,11]
          3 plt.scatter(x,y)
          4 plt.show()
```



```
In [25]: 1 x=np.arange(6)
          2 y=x
          3 z=x**2
          4 e=x**3
```

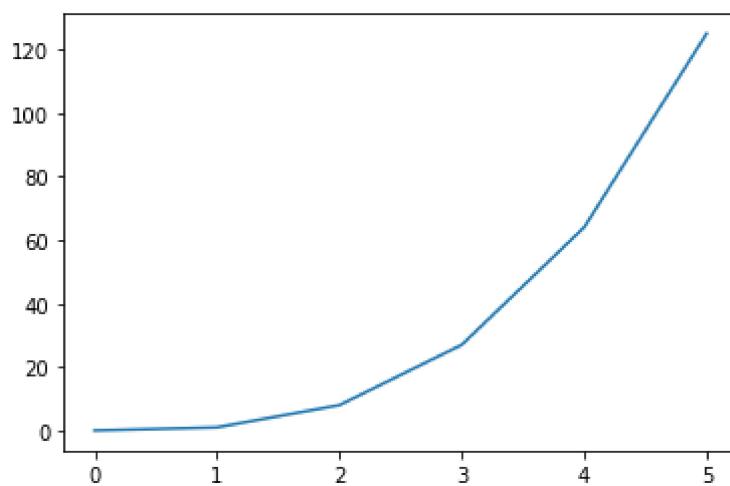
In [26]: 1 plt.plot(x,y)

Out[26]: [`<matplotlib.lines.Line2D at 0x1e27d47da90>`]



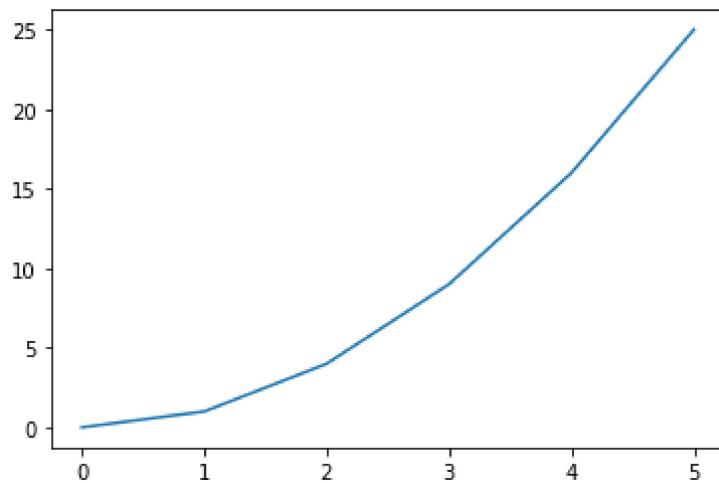
In [27]: 1 plt.plot(x,e)

Out[27]: [`<matplotlib.lines.Line2D at 0x1e27d4325e0>`]

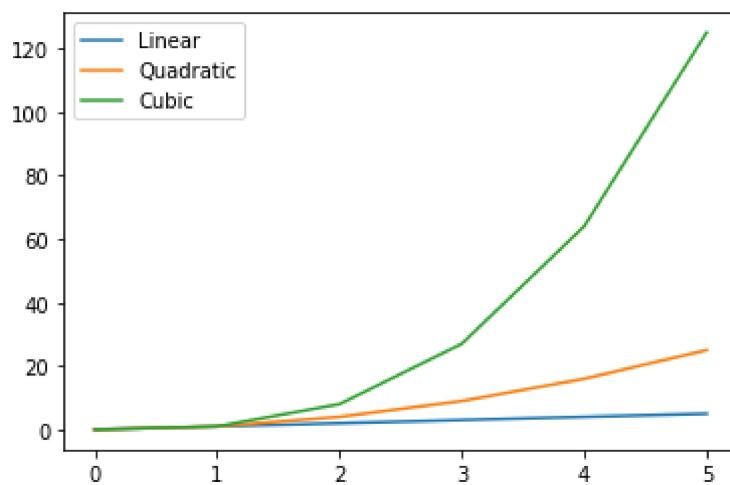


```
In [28]: 1 plt.plot(x,z)
```

```
Out[28]: [<matplotlib.lines.Line2D at 0x1e27d3abd30>]
```

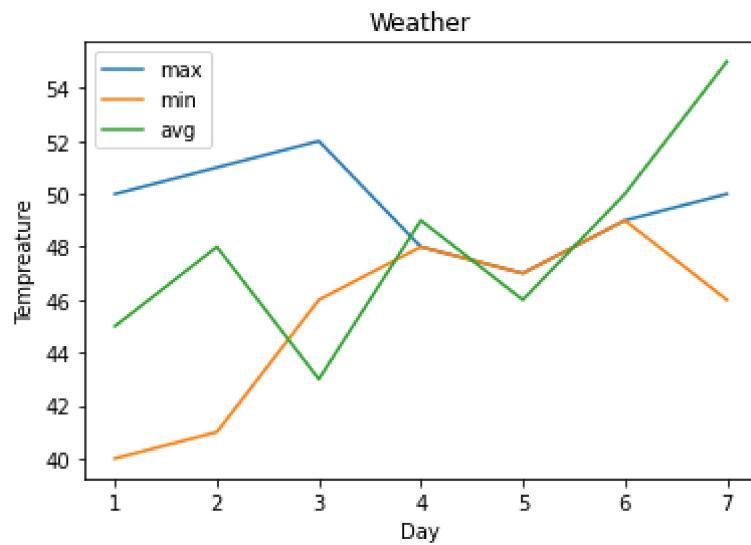


```
In [29]: 1 plt.plot(x,y,label='Linear')
  2 plt.plot(x,z,label='Quadratic')
  3 plt.plot(x,e,label='Cubic')
  4 plt.legend()
  5 plt.show()
```



In [30]:

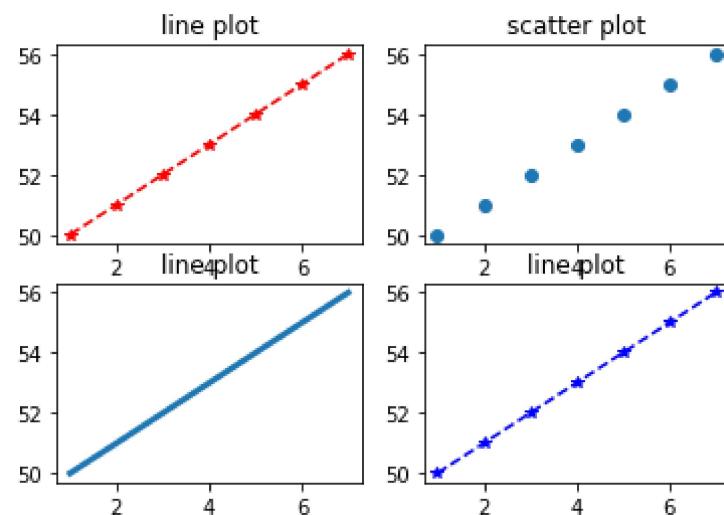
```
1 days=[1,2,3,4,5,6,7]
2 max_t=[50,51,52,48,47,49,50]
3 min_t=[40,41,46,48,47,49,46]
4 avg_t=[45,48,43,49,46,50,55]
5 plt.plot(days,max_t,label='max')
6 plt.plot(days,min_t,label='min')
7 plt.plot(days,avg_t,label='avg')
8 plt.xlabel('Day')
9 plt.ylabel('Tempreature')
10 plt.title('Weather')
11 plt.legend()
12 plt.show()
```



Subplot

In [31]:

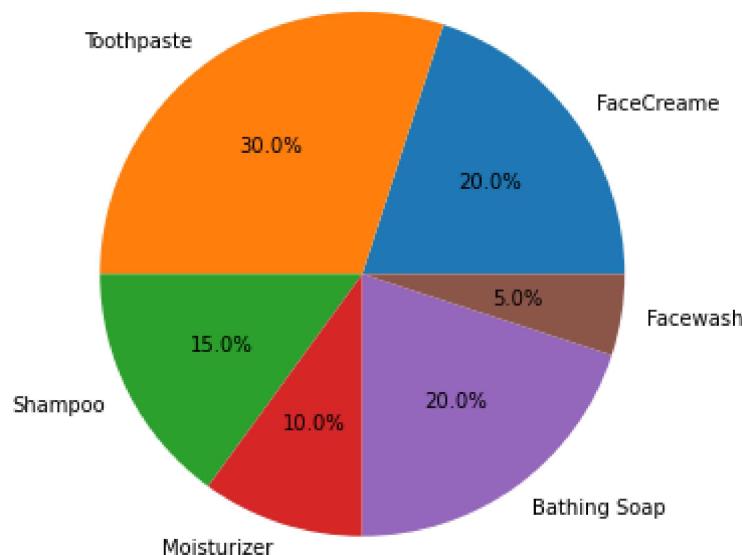
```
1 x=[1,2,3,4,5,6,7]
2 y=[50,51,52,53,54,55,56]
3
4 plt.subplot(2,2,1)
5 plt.plot(x,y,c='red',marker='*',linestyle='dashed')
6 plt.title('line plot')
7
8 plt.subplot(2,2,2)
9 plt.scatter(x,y)
10 plt.title('scatter plot')
11
12 plt.subplot(2,2,3)
13 plt.plot(x,y,linewidth=3)
14 plt.title('line plot')
15
16 plt.subplot(2,2,4)
17 plt.plot(x,y,c='blue',marker='*',linestyle='dashed')
18 plt.title('line plot')
19 plt.show()
```



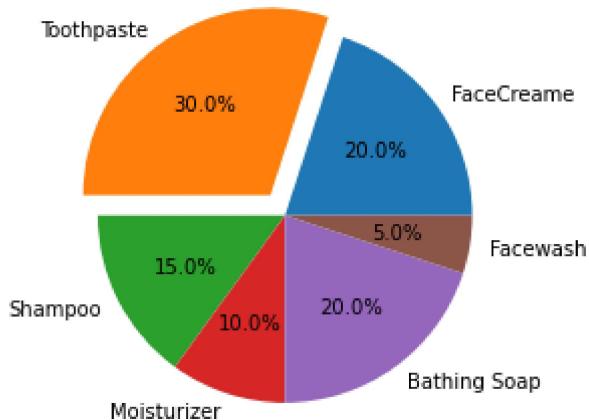
Pie Chart

In [32]:

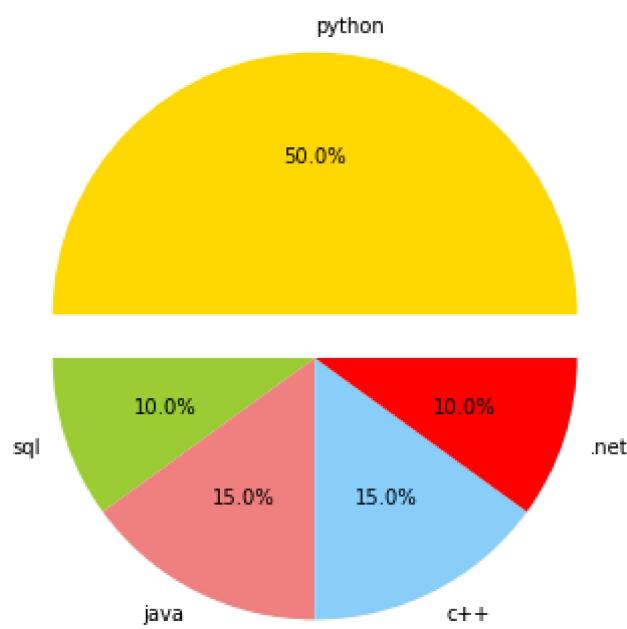
```
1 list=[20,30,15,10,20,5]
2 lbs=['FaceCreame','Toothpaste','Shampoo','Moisturizer','Bathing Soap','Facewash']
3 plt.pie(list,labels=lbs,autopct='%1.1f%%',radius=1.5)
4 plt.show()
```



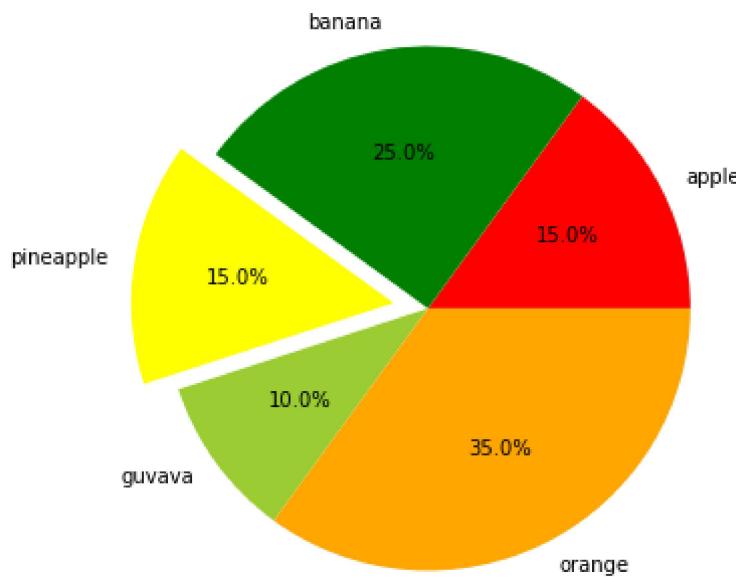
```
In [33]: 1 plt.pie(list,labels=lbs,autopct='%1.1f%%',radius=1.5,explode=[0,0.2,0,0,0,0])
2 plt.axis('equal')
3 plt.show()
```



```
In [34]: 1 lang=['python','sql','java','c++','.net']
2 contr=[50,10,15,15,10]
3 ex=[0.25,0,0,0,0]
4 c=['gold','yellowgreen','lightcoral','lightskyblue','red']
5 plt.pie(contr,labels=lang,radius=1.5,colors=c,explode=ex,autopct='%1.1f%%')
6 plt.show()
```

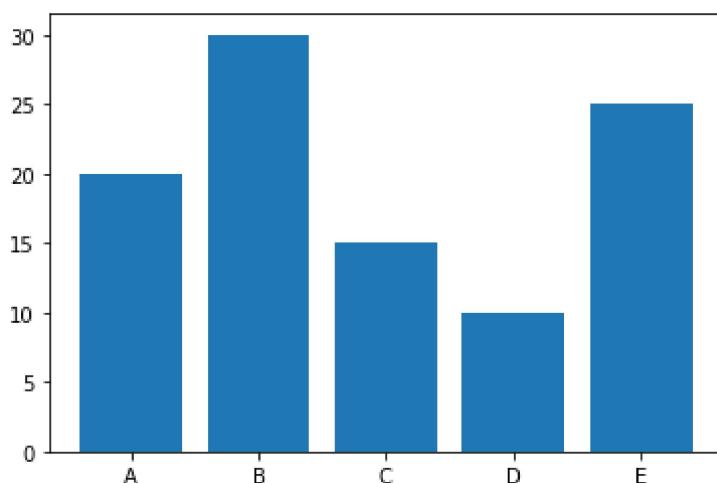


```
In [35]: 1 fruits=['apple','banana','pineapple','guvava','orange']
2 mrktshr=[15,25,15,10,35]
3 co=['red','green','yellow','yellowgreen','orange']
4 ec=[0,0,0.2,0,0]
5 plt.pie(mrktshr,labels=fruits,explode=ec,colors=co, radius=1.5, autopct='%.1f%%')
6 plt.show()
```



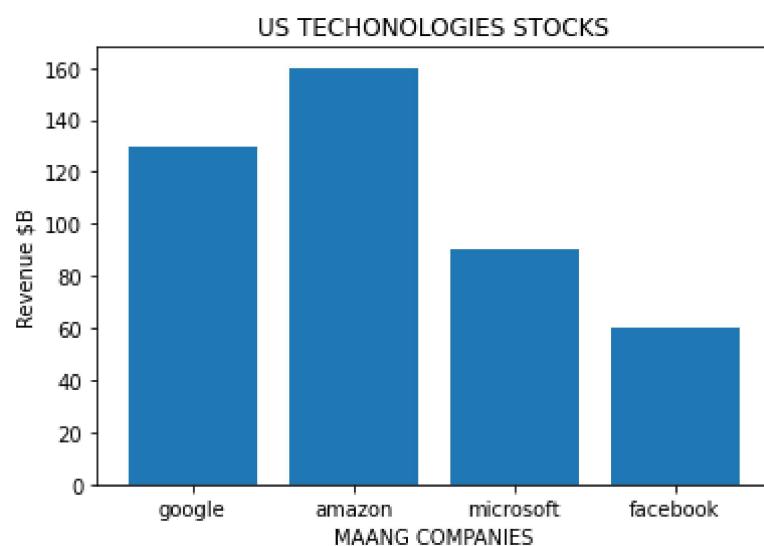
Bar Plot

```
In [36]: 1 list=[20,30,15,10,25]
2 lbs=['A','B',"C",'D','E']
3 plt.bar(lbs,list)
4 plt.show()
```



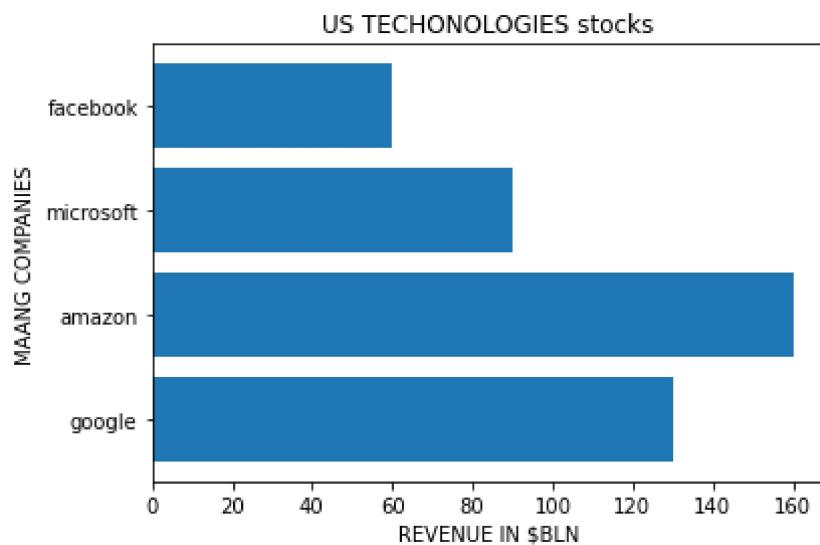
In [37]:

```
1 company=['google','amazon','microsoft','facebook']
2 revenue=[130,160,90,60]
3 plt.bar(company,revenue)
4 plt.xlabel('MAANG COMPANIES')
5 plt.ylabel('Revenue $B')
6 plt.title('US TECHONOLOGIES STOCKS')
7 plt.show()
```



In [38]:

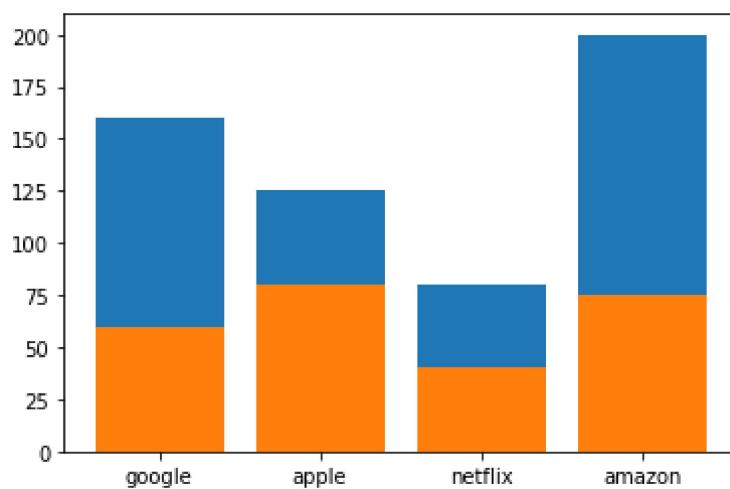
```
1 company=['google','amazon','microsoft','facebook']
2 revenue=[130,160,90,60]
3 plt.barh(company,revenue)
4 plt.xlabel('REVENUE IN $BLN')
5 plt.ylabel('MAANG COMPANIES')
6 plt.title('US TECHONOLOGIES stocks' )
7 plt.show()
```



Stacked Bar Plot

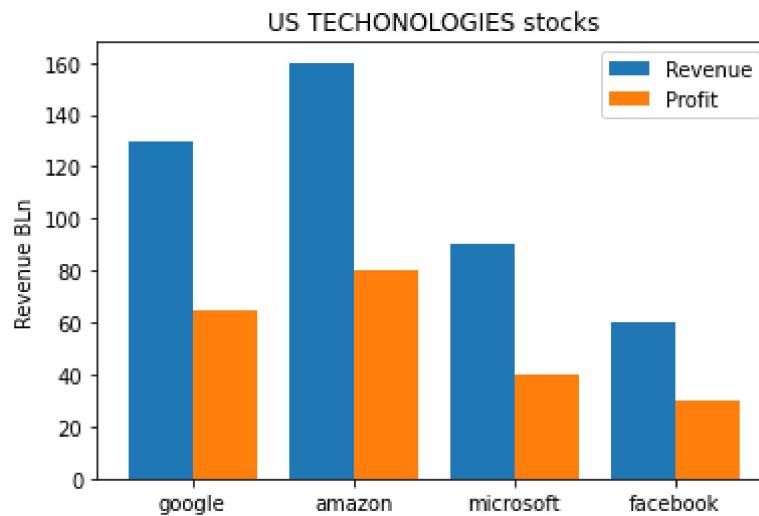
In [39]:

```
1 company=['google','apple','netflix','amazon']
2 revnue=[160,125,80,200]
3 profit=[60,80,40,75]
4 plt.bar(company,revnue,label='Revenue in BLN')
5 plt.bar(company,profit,label='Profit')
6 plt.show()
```



In [40]:

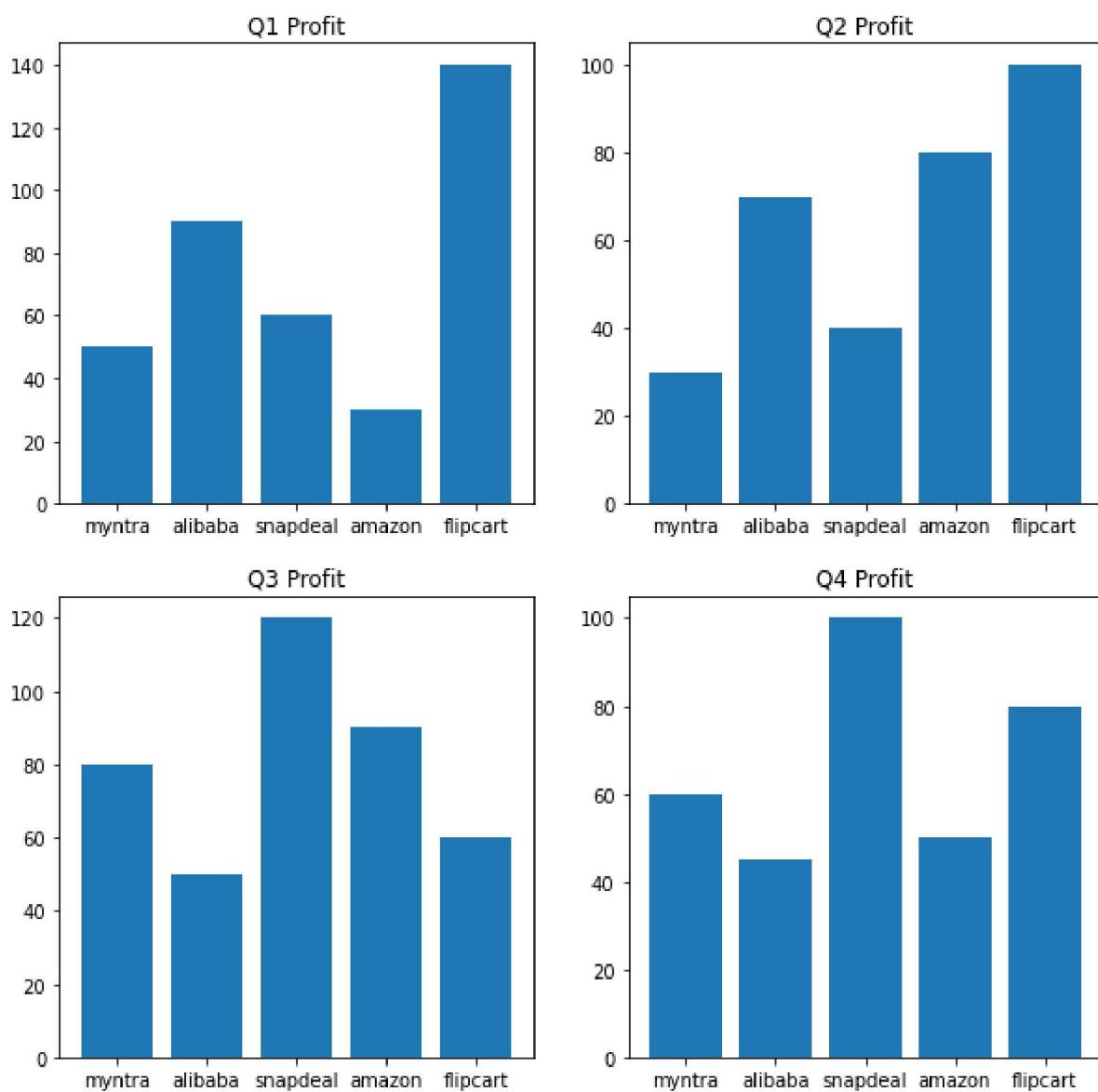
```
1 company=['google','amazon','microsoft','facebook']
2 revenue=[130,160,90,60]
3 profit=[65,80,40,30]
4 xpos=np.arange(len(company))
5 plt.bar(xpos-0.2,revenue,width=0.4,label='Revenue')
6 plt.bar(xpos+0.2,profit,width=0.4,label='Profit')
7 plt.xticks(xpos,company)
8 plt.ylabel('Revenue BLn')
9 plt.title('US TECHONOLOGIES stocks' )
10 plt.legend()
11 plt.show()
12
```



In [41]:

```
1 ecom=['myntra','alibaba','snapdeal','amazon','flipcart']
2 q1_p=[50,90,60,30,140]
3 q2_p=[30,70,40,80,100]
4 q3_p=[80,50,120,90,60]
5 q4_p=[60,45,100,50,80]
6 q5_p=[100,60,70,120,110]
7 plt.figure(1,figsize=(10,10))
8
9 plt.subplot(2,2,1)
10 plt.bar(ecom,q1_p)
11 plt.title('Q1 Profit')
12
13 plt.subplot(2,2,2)
14 plt.bar(ecom,q2_p)
15 plt.title('Q2 Profit')
16
17 plt.subplot(2,2,3)
18 plt.bar(ecom,q3_p)
19 plt.title('Q3 Profit')
20
21
22 plt.subplot(2,2,4)
23 plt.bar(ecom,q4_p)
24 plt.title('Q4 Profit')
25
26 plt.suptitle('Profit on Quatresly Basis')
27 plt.show()
```

Profit on Quatresly Basis



In []:

1