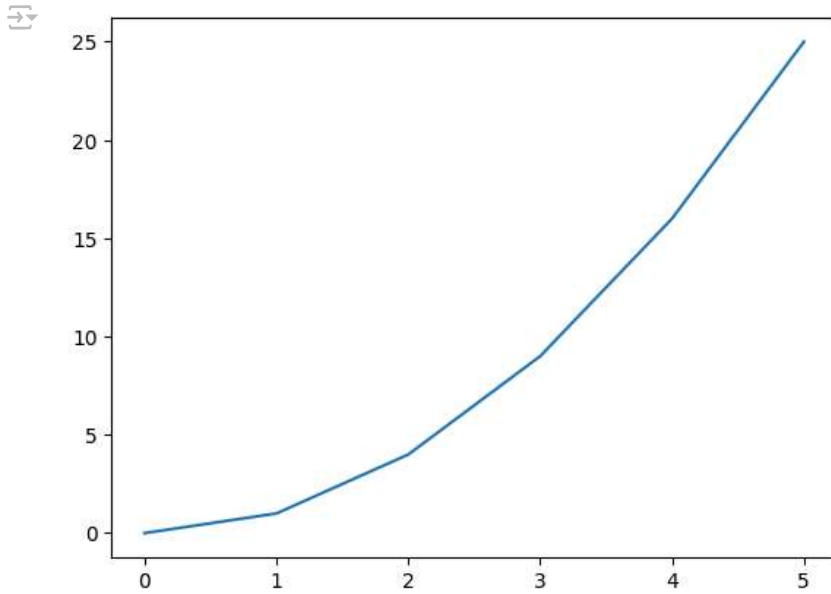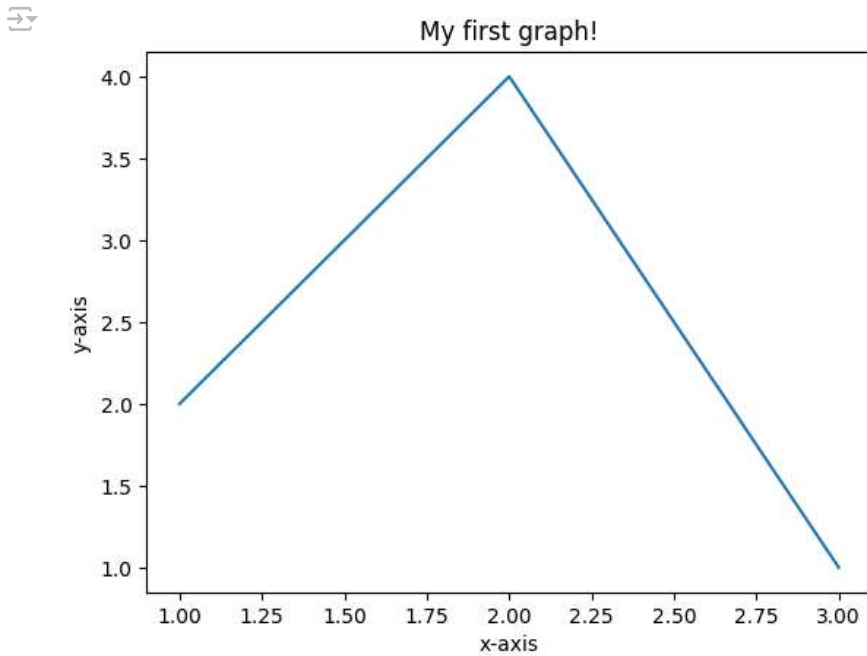```python
import matplotlib.pyplot as plt
x_values=[0,1,2,3,4,5]
y_values=[0,1,4,9,16,25]
plt.plot(x_values,y_values)
plt.show()
```
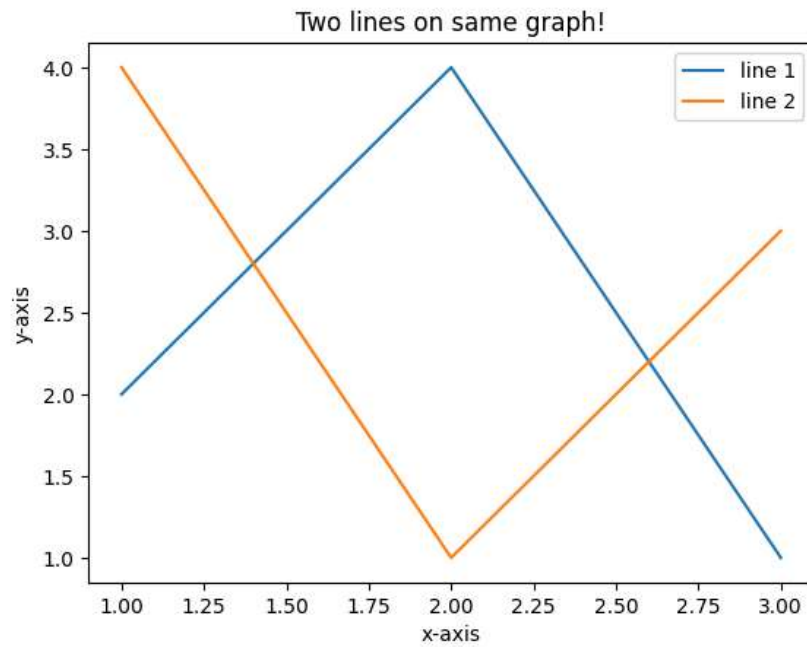


```python
import matplotlib.pyplot as plt
x=[1,2,3]
y=[2,4,1]
plt.plot(x,y)
plt.xlabel('x-axis')
plt.ylabel('y-axis')
plt.title('My first graph!')
plt.show()
```



```python
import matplotlib.pyplot as plt
x1=[1,2,3]
y1=[2,4,1]
plt.plot(x1,y1,label="line 1")
x2=[1,2,3]
y2=[4,1,3]
plt.plot(x2,y2,label="line 2")
plt.xlabel('x-axis')
```
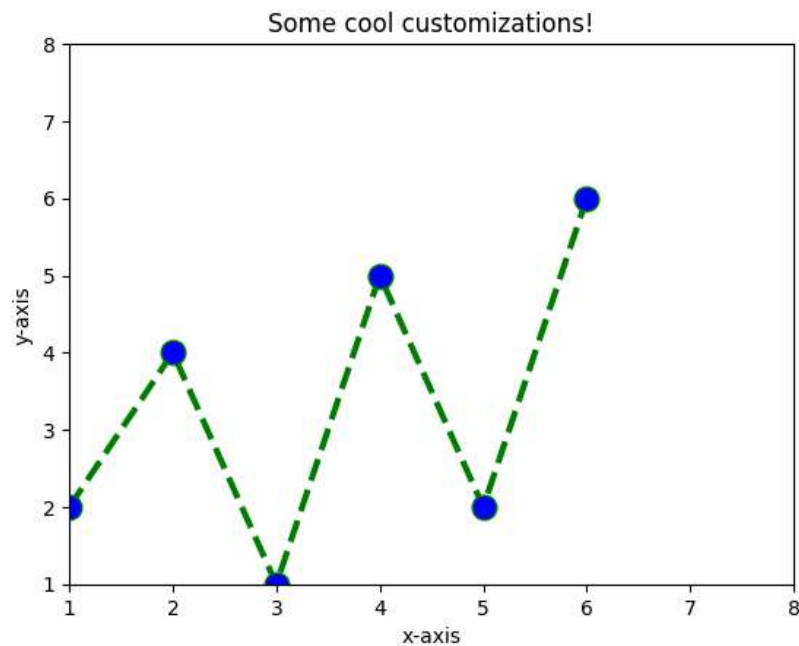
```
plt.ylabel('y-axis')
plt.title('Two lines on same graph!')
plt.legend()
plt.show()
```



```python
import matplotlib.pyplot as plt
x=[1,2,3,4,5,6]
y=[2,4,1,5,2,6]
plt.plot(x,y,color='green',linestyle='dashed',linewidth=3,marker='o',markerfacecolor='blue',markersize=12)
plt.ylim(1,8)
plt.xlim(1,8)

plt.xlabel('x-axis')
plt.ylabel('y-axis')
plt.title('Some cool customizations!')

plt.show()
```
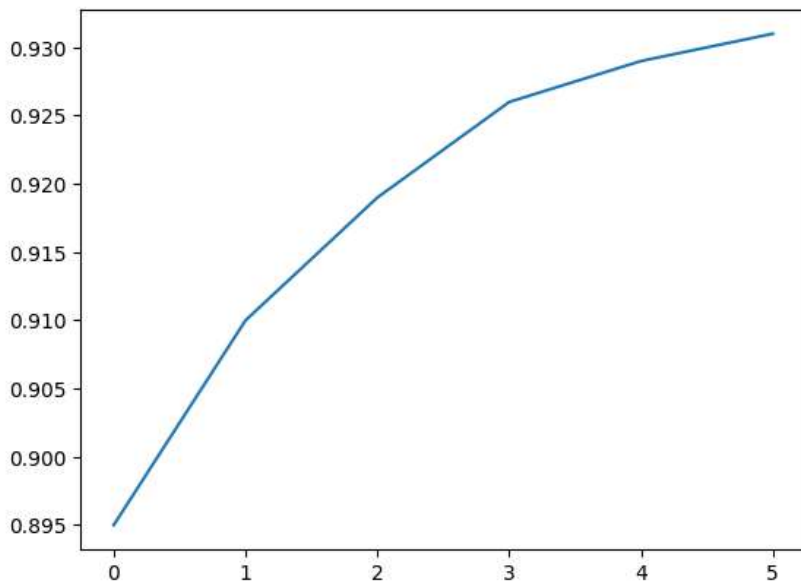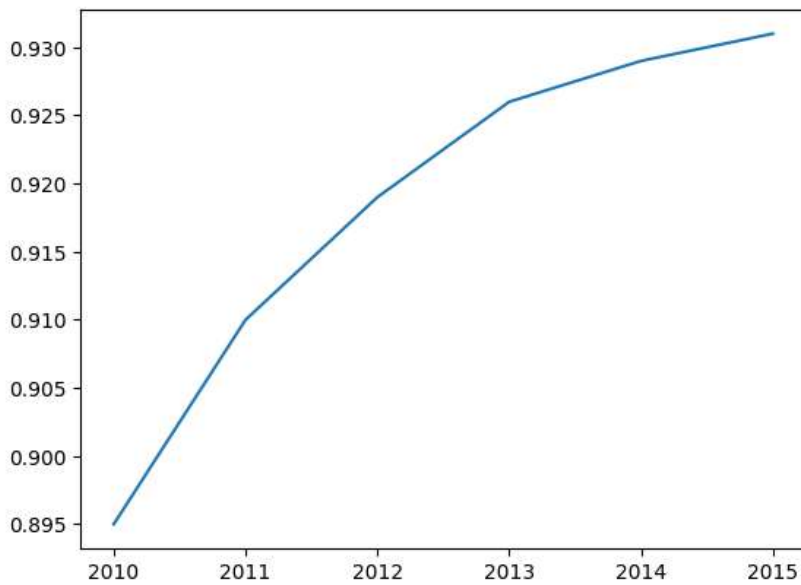


```python
yield_apples=[0.895,0.91,0.919,0.926,0.929,0.931]
plt.plot(yield_apples)
```
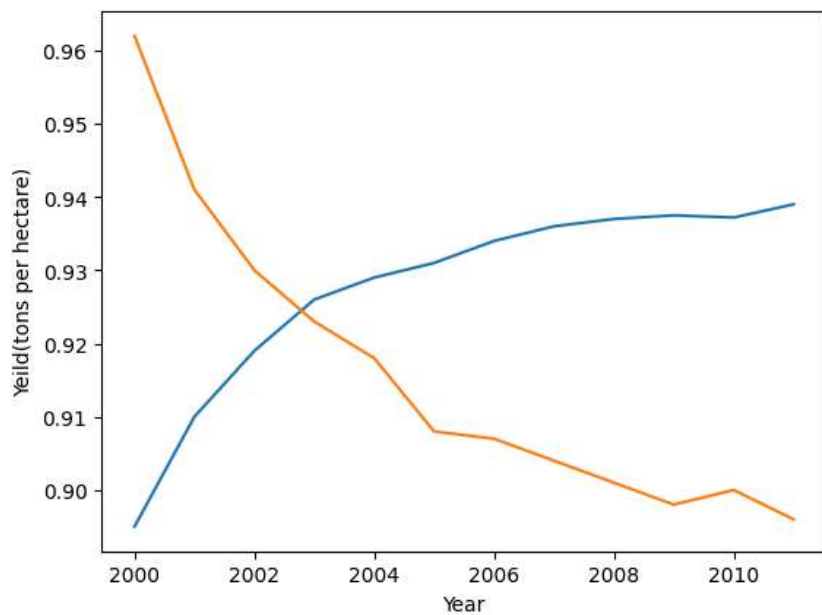
```
years=[2010,2011,2012,2013,2014,2015]
yeild_apples=[0.895,0.91,0.919,0.926,0.929,0.931]
plt.plot(years,yeild_apples)
```

```
years=range(2000,2012)
apples= [0.895,0.91,0.919,0.926,0.929,0.931,0.934,0.936,0.937,0.9375,0.9372,0.939]
oranges=[0.962,0.941,0.930,0.923,0.918,0.908,0.907,0.904,0.901,0.898,0.9,0.896,]
plt.plot(years,apples)
plt.plot(years,oranges)
plt.xlabel('Year')
plt.ylabel('Yeild(tons per hectare)');
```

```
plt.plot(years,apples)
plt.plot(years,oranges)
plt.xlabel('Year')
plt.ylabel('Yeild(tons per hectare)')
plt.title("Crop Yeilds in Kanto")
plt.legend(['Apples','Oranges']);
```
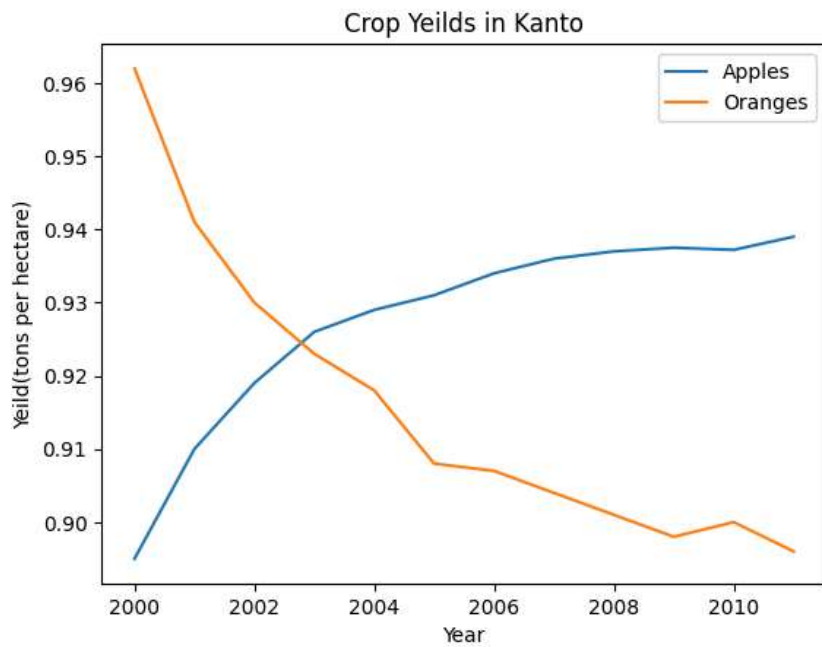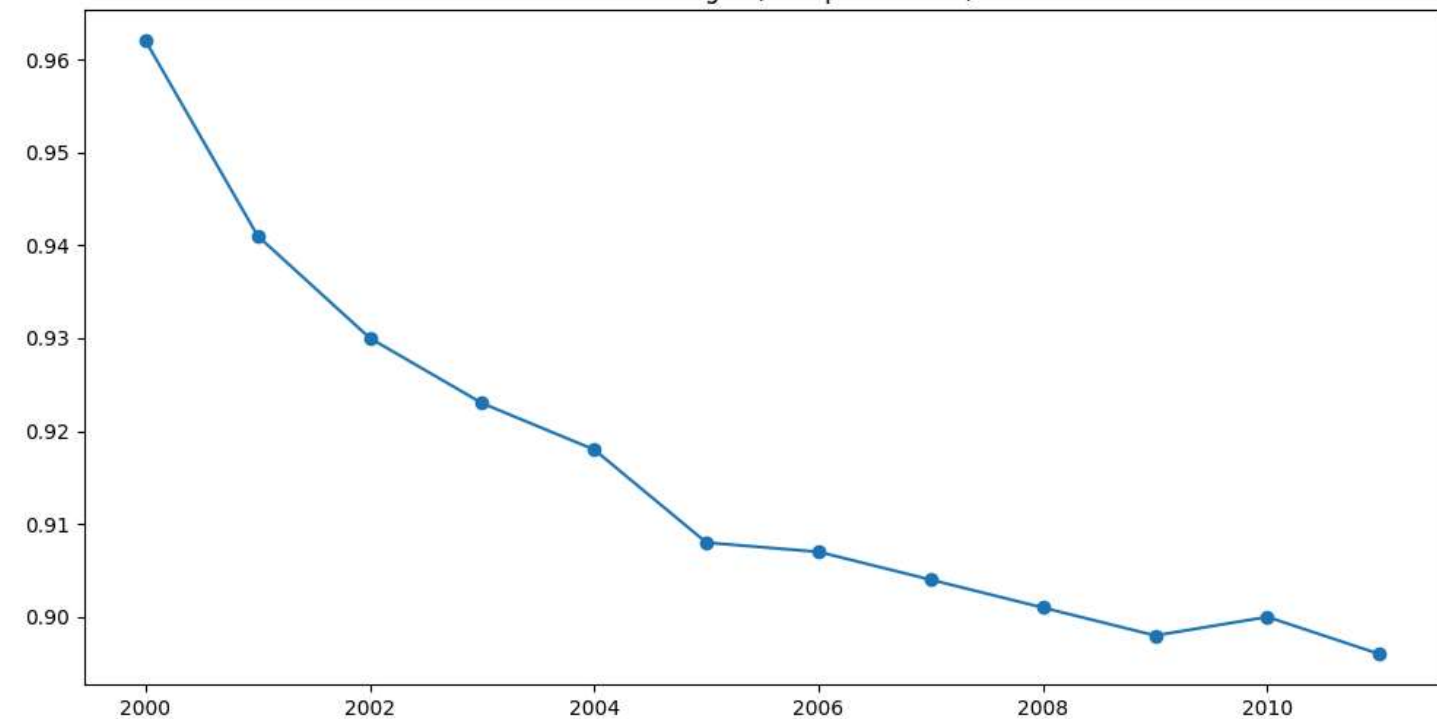


```
years=range(2000,2012)
oranges=[0.962,0.941,0.930,0.923,0.918,0.908,0.907,0.904,0.901,0.898,0.9,0.896,]
plt.figure(figsize=(12,6))
plt.plot(years,oranges,marker='o')
plt.title("Yeild of Oranges (tons per hectare)");
```

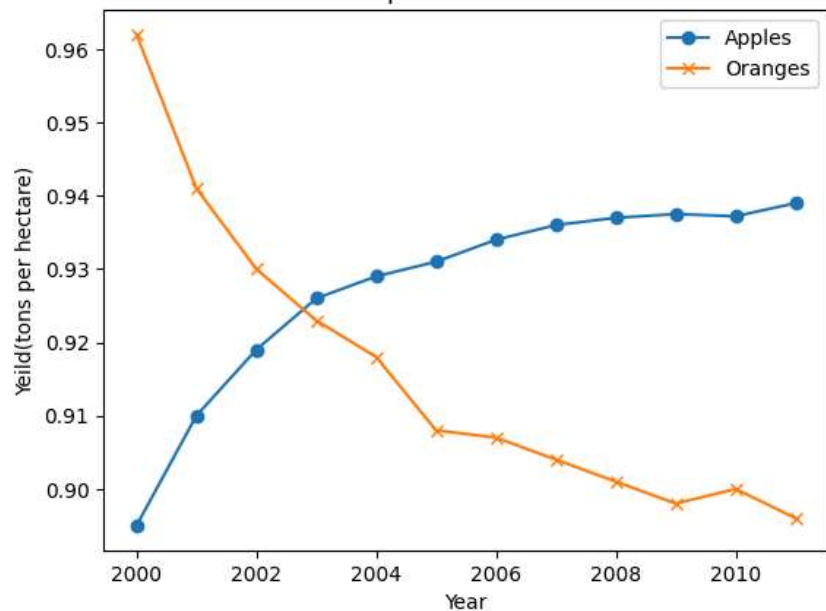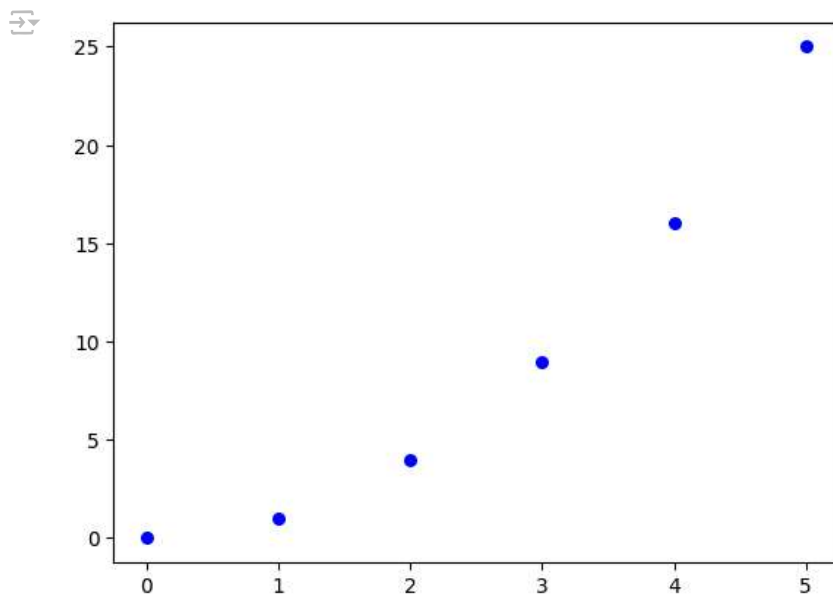Yeild of Oranges (tons per hectare)

```
plt.plot(years,apples,marker='o')
plt.plot(years,oranges,marker='x')
plt.xlabel('Year')
plt.ylabel('Yeild(tons per hectare)')
plt.title("Crop Yeilds in Kanto")
plt.legend(['Apples','Oranges']);
```
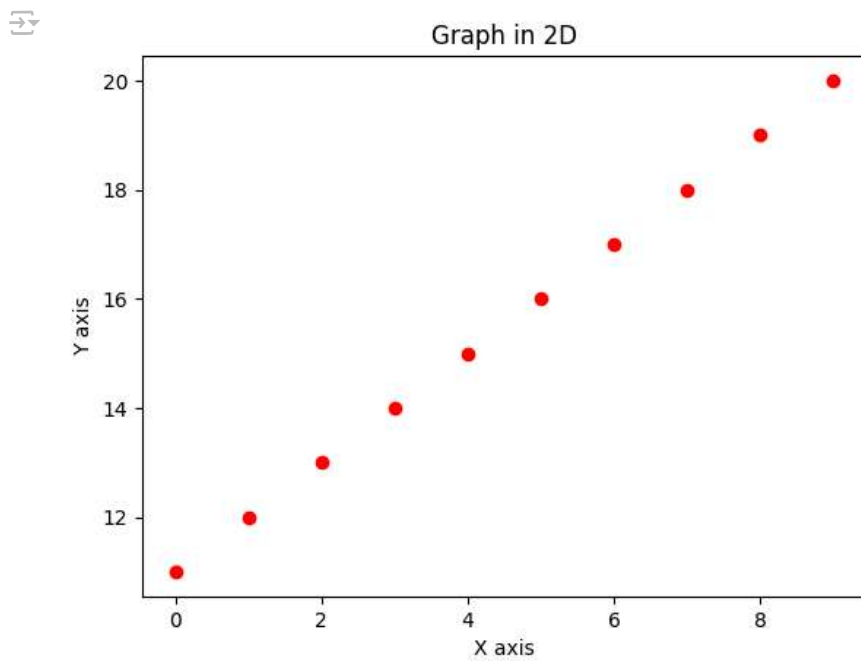

Crop Yeilds in Kanto

```
import matplotlib.pyplot as plt
x_values=[0,1,2,3,4,5]
y_values=[0,1,4,9,16,25]
plt.scatter(x_values,y_values,s=30,color="blue")
plt.show()
```

```
import matplotlib.pyplot as plt
import numpy as np
import pandas as pd
x=np.arange(0,10)
y=np.arange(11,21)
x
```

    array([0, 1, 2, 3, 4, 5, 6, 7, 8, 9])

```
plt.scatter(x,y,c='r')
plt.xlabel('X axis')
plt.ylabel('Y axis')
plt.title('Graph in 2D')
plt.savefig('Test.png')
```
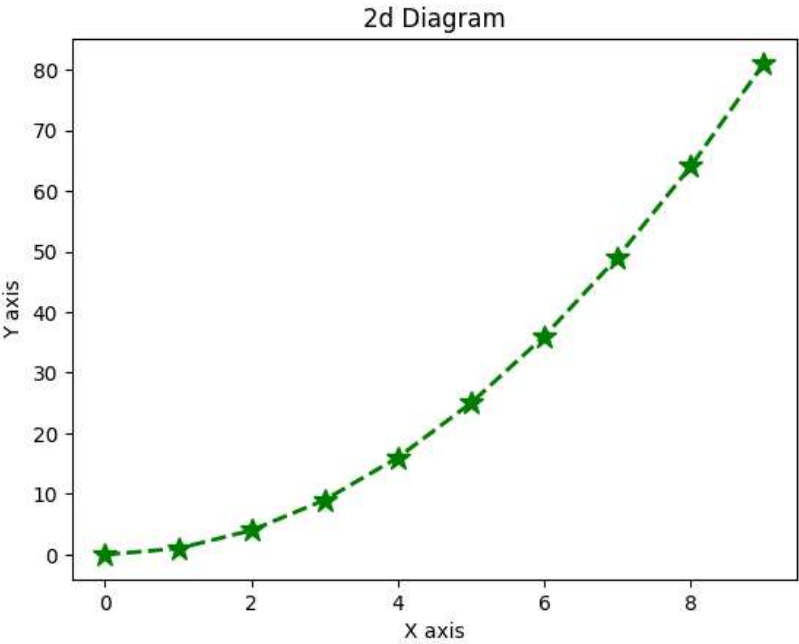


```
y=x*x
y
```

    array([0, 1, 4, 9, 16, 25, 36, 49, 64, 81])

```
plt.plot(x,y,'g*',linestyle='dashed',linewidth=2,markersize=12)
plt.xlabel('X axis')
plt.ylabel('Y axis')
```

```
plt.title('2d Diagram')
```

Text(0.5, 1.0, '2d Diagram')


```
np.pi
```

3.141592653589793

```
x=np.arange(0,4*np.pi,0.1)
y=np.sin(x)
plt.title("sine wave form")
plt.plot(x,y)
plt.show()
```
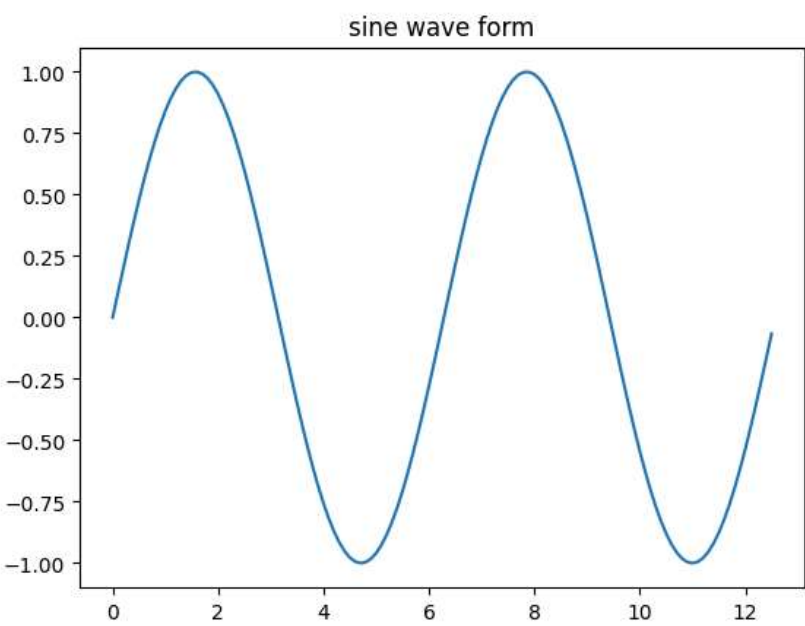


```
import matplotlib.pyplot as plt
import numpy as np
x=[1,2,3,4,5]
y1=[10,12,14,16,18]
y2=[5,7,9,11,13]
y3=[2,4,6,8,10]
plt.fill_between(x,y1,color="blue")
plt.fill_between(x,y2,color="green")
plt.plot(x,y1,color="red")
plt.plot(x,y2,color="black")
```

```
plt.legend(['y1','y2'])
plt.show()
```



```
import matplotlib.pyplot as plt
height=[10,24,36,40,5]
names=['one','two','three','four','five']
c1=['red','green']
c2=['b','g']
plt.bar(names,height,width=0.8,color=c1)
plt.xlabel('x-axis')
plt.ylabel('y-axis')
plt.title('My bar chart!')
plt.show()
```
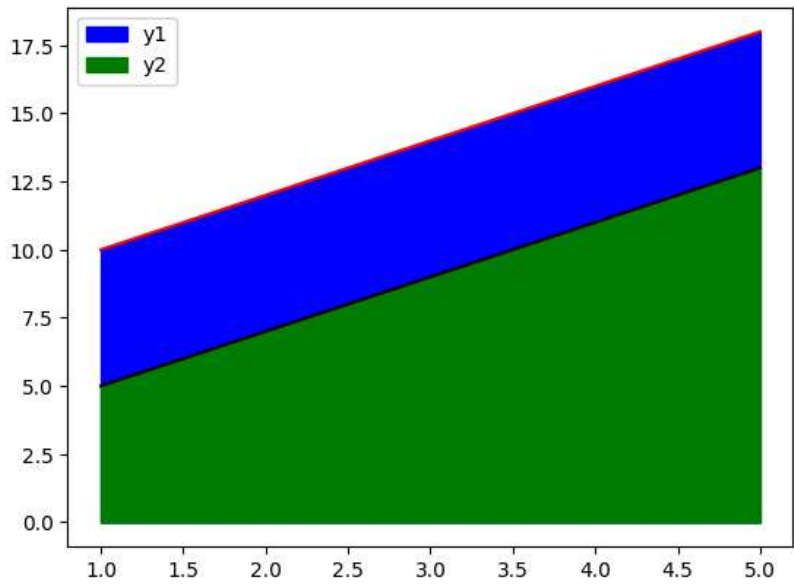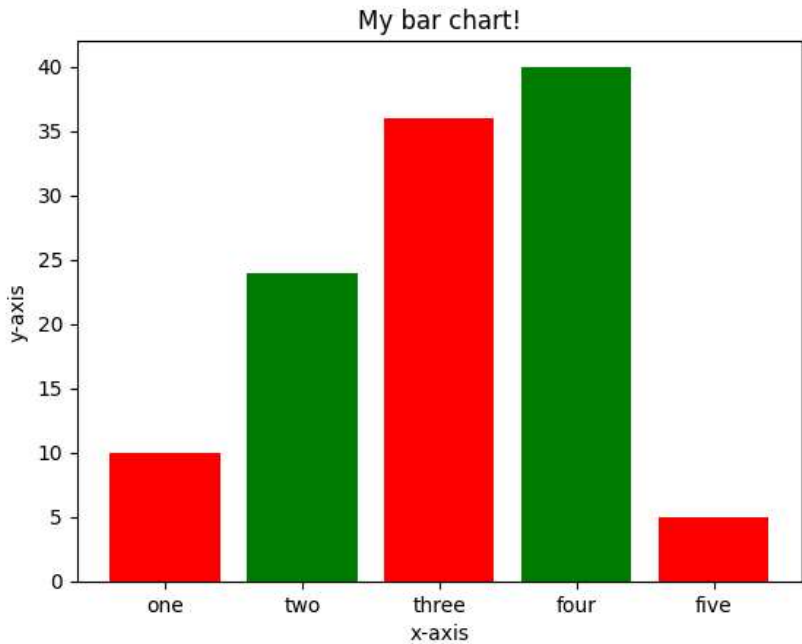


```
x=[2,8,10]
y=[11,16,9]
x2=[3,9,11]
y2=[6,15,11]
plt.bar(x,y,color='r')
plt.bar(x2,y2,color='g')
plt.title('Bar graph')
plt.ylabel('Y axis')
plt.xlabel('X axis')
plt.show()
```

Bar graph
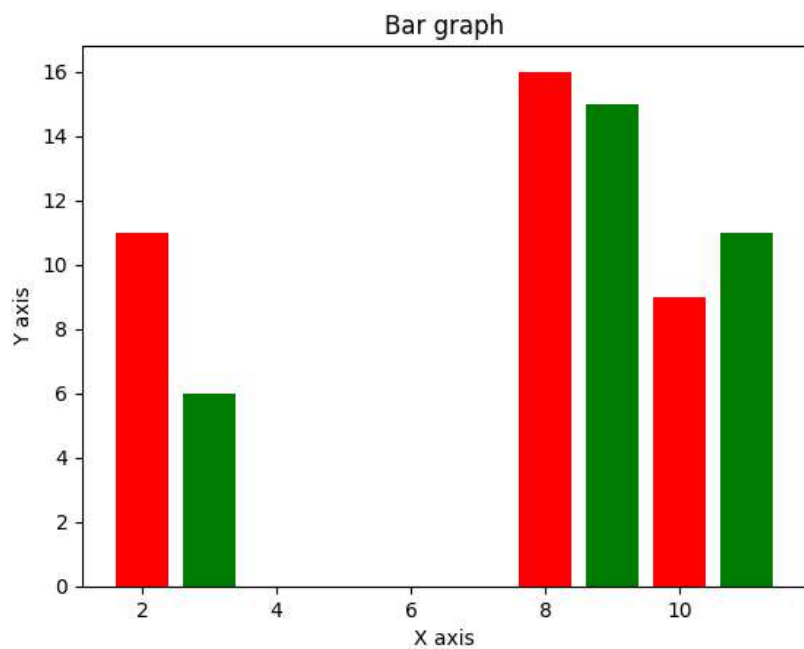

```
import matplotlib.pyplot as plt
ages=[2,5,70,40,30,45,50,45,50,45,43,40,44,60,7,13,57,18,90,77,32,21,20,40]
range=(0,100)
bins=10
plt.hist(ages,bins,range,color='green',histtype='bar',rwidth=0.8)
plt.xlabel('age')
plt.ylabel('No.of people')
plt.title('My histogram')
plt.show()
```
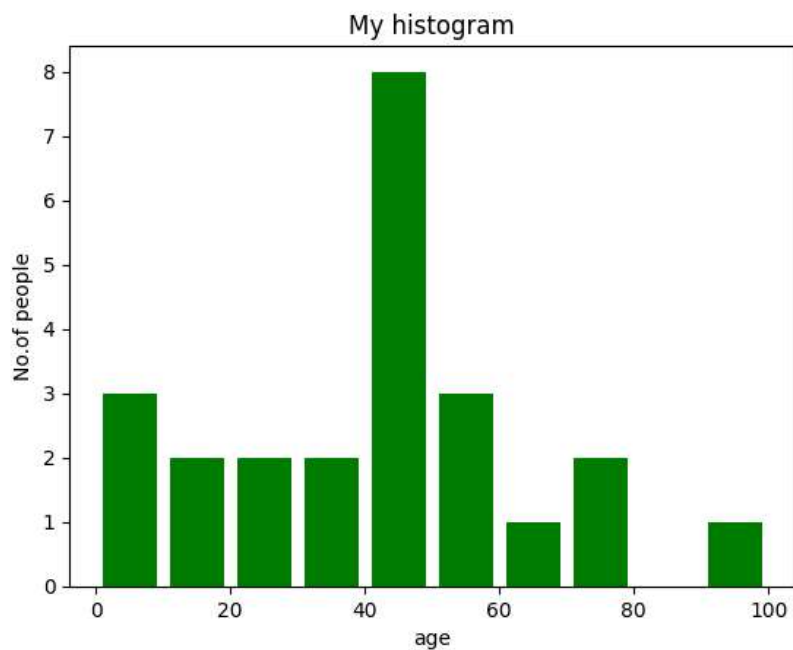
My histogram


```
import matplotlib.pyplot as plt
import numpy as np
np.random.seed(0)
data=np.random.normal(loc=0,scale=1,size=100)
data
```

```
array([ 1.76405235,  0.40015721,  0.97873798,  2.2408932 ,  1.86755799,
       -0.97727788,  0.95008842, -0.15135721, -0.10321885,  0.4105985 ,
        0.14404357,  1.45427351,  0.76103773,  0.12167502,  0.44386323,
        0.33367433,  1.49407907, -0.20515826,  0.3130677 , -0.85409574,
       -2.55298982,  0.6536186 ,  0.8644362 , -0.74216502,  2.26975462,
       -1.45436567,  0.04575852, -0.18718385,  1.53277921,  1.46935877,
        0.15494743,  0.37816252, -0.88778575, -1.98079647, -0.34791215,
```

```
       0.15634897,  1.23029068,  1.20237985, -0.38732682, -0.30230275,
      -1.04855297, -1.42001794, -1.70627019,  1.9507754 , -0.50965218,
      -0.4380743 , -1.25279536,  0.77749036, -1.61389785, -0.21274028,
      -0.89546656,  0.3869025 , -0.51080514, -1.18063218, -0.02818223,
       0.42833187,  0.06651722,  0.3024719 , -0.63432209, -0.36274117,
      -0.67246045, -0.35955316, -0.81314628, -1.7262826 ,  0.17742614,
      -0.40178094, -1.63019835,  0.46278226, -0.90729836,  0.0519454 ,
       0.72909056,  0.12898291,  1.13940068, -1.23482582,  0.40234164,
      -0.68481009, -0.87079715, -0.57884966, -0.31155253,  0.05616534,
      -1.16514984,  0.90082649,  0.46566244, -1.53624369,  1.48825219,
       1.89588918,  1.17877957, -0.17992484, -1.07075262,  1.05445173,
      -0.40317695,  1.22244507,  0.20827498,  0.97663904,  0.3563664 ,
       0.70657317,  0.01050002,  1.78587049,  0.12691209,  0.40198936])
```
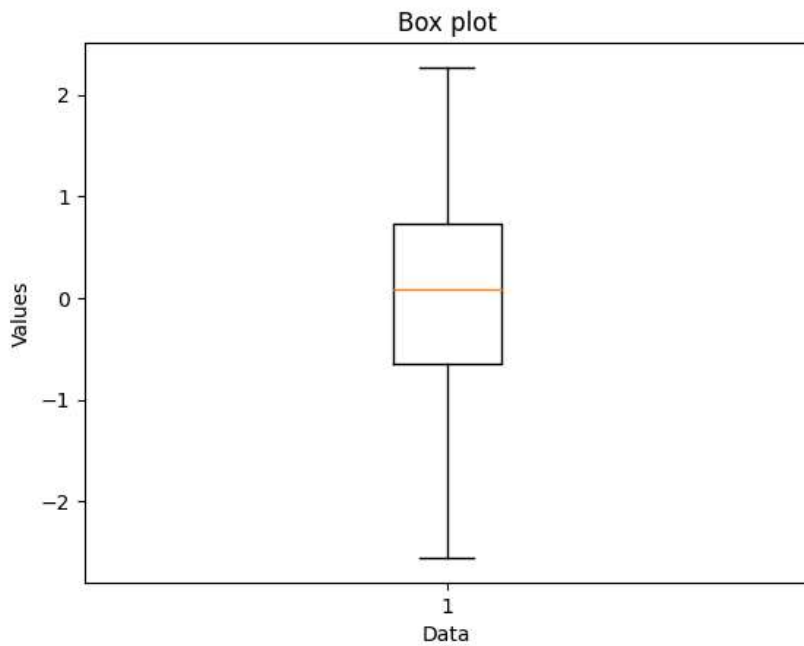
```python
fig,ax=plt.subplots()
ax.boxplot(data)
ax.set_xlabel('Data')
ax.set_ylabel('Values')
ax.set_title('Box plot')
```

Text(0.5, 1.0, 'Box plot')


```python
labels='Python','C++','Ruby','Java'
sizes=[215,130,245,210]
colors=['gold','yellowgreen','lightcoral','lightskyblue']
explode=(0,0.4,0,0.5)
plt.pie(sizes,explode=explode,labels=labels,colors=colors,
autopct='%1.1f%%',shadow=True)
plt.axis('equal')
plt.show()
```

```
activities=['eat','sleep','work','play']
slices=[3,7,8,6]
colors=['r','y','g','b']
plt.pie(slices,labels=activities,colors=colors,
        startangle=90,shadow=True,explode=(0,0,0.1,0),
        radius=1.2,autopct='%1.1f%%')
plt.legend()
```

<matplotlib.legend.Legend at 0x797452a2f640>