```
import numpy as np
```

```
print(np.__version__)
```

```
1.26.4
```

```
A1=np.array([1,2,34,])
print(A1)
type(A1)
```

```
[ 1  2 34]
numpy.ndarray
```

```
A1.size
```

```
3
```

```
A2=np.array([[1,2,3],[4,5,6]])
print(A2)
```

```
[[1 2 3]
 [4 5 6]]
```

```
A3=np.array([[[1,2,3],[4,5,6],[7,8,9]]])
print(A3)
```

```
[[[1 2 3]
  [4 5 6]
  [7 8 9]]]
```

```
A3.size
```

```
9
```

```
z1=np.zeros(3)
z1
```

```
array([0., 0., 0.])
```

```
z1=np.zeros(3,dtype=int)
z1
```

```
array([0, 0, 0])
```

```
z1.shape
```

```
(3,)
```

```
z1.size
```

```
3
```

```
z1.ndim
```

```
1
```

```
type(z1)
```

```
numpy.ndarray
```

```
z2=np.zeros((3,4))
z2
```

```
array([[0., 0., 0., 0.],
       [0., 0., 0., 0.],
       [0., 0., 0., 0.]])
```

```
z2=np.zeros((12,13),dtype='int')
print(z2)
```

```
[[0 0 0 0 0 0 0 0 0 0 0 0 0]
 [0 0 0 0 0 0 0 0 0 0 0 0 0]
 [0 0 0 0 0 0 0 0 0 0 0 0 0]
 [0 0 0 0 0 0 0 0 0 0 0 0 0]
```

```
       [0 0 0 0 0 0 0 0 0 0 0 0 0]
       [0 0 0 0 0 0 0 0 0 0 0 0 0]
       [0 0 0 0 0 0 0 0 0 0 0 0 0]
       [0 0 0 0 0 0 0 0 0 0 0 0 0]
       [0 0 0 0 0 0 0 0 0 0 0 0 0]
       [0 0 0 0 0 0 0 0 0 0 0 0 0]
       [0 0 0 0 0 0 0 0 0 0 0 0 0]
       [0 0 0 0 0 0 0 0 0 0 0 0 0]]
```

```
a1=np.ones(3)
a1
```

```
array([1., 1., 1.])
```

```
a1.size
```

```
3
```

a2=np.ones([3,4]) a2

```
a3=np.ones([4,2,3])
a3
```

```
array([[[1., 1., 1.],
        [1., 1., 1.]],

       [[1., 1., 1.],
        [1., 1., 1.]],

       [[1., 1., 1.],
        [1., 1., 1.]],

       [[1., 1., 1.],
        [1., 1., 1.]]])
```

```
type(a3)
```

```
numpy.ndarray
```

```
a3.size
```

```
24
```

a3.shape

```
f1=np.full(3,9)
f1
```

```
array([9, 9, 9])
```

```
f1=np.full(3,9,dtype=float)
f1
```

```
array([9., 9., 9.])
```

```
f2=np.full([2,3],9)
f2
```

```
array([[9, 9, 9],
       [9, 9, 9]])
```

```
f3=np.full([4,2,3],5)
f3
```

```
array([[[5, 5, 5],
        [5, 5, 5]],

       [[5, 5, 5],
        [5, 5, 5]],

       [[5, 5, 5],
        [5, 5, 5]],

       [[5, 5, 5],
        [5, 5, 5]]])
```

```
a=np.array([1,2,3])
b=np.array([1,2,3])
add=np.add(a,b)
add
```

```
array([2, 4, 6])
```

```
a=np.array([13,25,332])
b=np.array([1,2,3])
sub=np.subtract(a,b)
sub
```

```
array([ 12,  23, 329])
```

```
a=np.array([1,2,3])
b=np.array([1,2,3])
add=np.multiply(a,b)
add
```

```
array([1, 4, 9])
```

```
a=np.array([1,2,3])
b=np.array([1,2,3])
add=np.mod(a,b)
add
```

```
array([0, 0, 0])
```

```
!pip install matplotlib
```

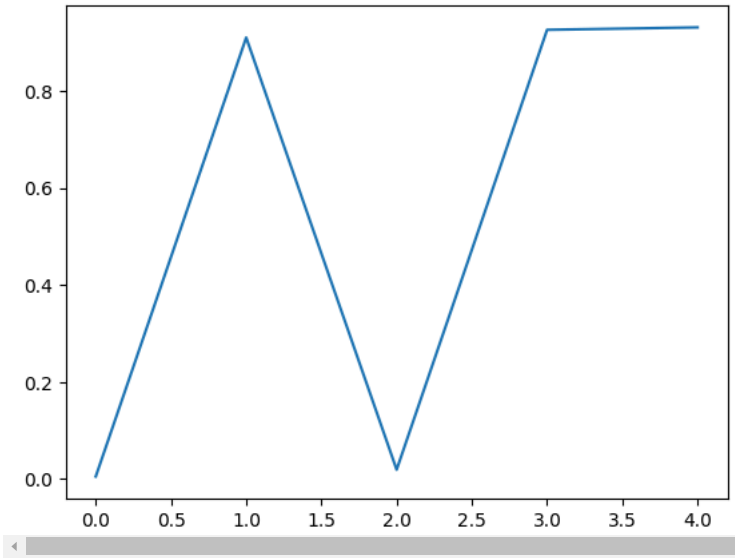
```
Requirement already satisfied: matplotlib in /usr/local/lib/python3.10/dist-packages (3.7.1)
Requirement already satisfied: contourpy>=1.0.1 in /usr/local/lib/python3.10/dist-packages (from matplotlib) (1.2.1)
Requirement already satisfied: cycler>=0.10 in /usr/local/lib/python3.10/dist-packages (from matplotlib) (0.12.1)
Requirement already satisfied: fonttools>=4.22.0 in /usr/local/lib/python3.10/dist-packages (from matplotlib) (4.53.1)
Requirement already satisfied: kiwisolver>=1.0.1 in /usr/local/lib/python3.10/dist-packages (from matplotlib) (1.4.5)
Requirement already satisfied: numpy>=1.20 in /usr/local/lib/python3.10/dist-packages (from matplotlib) (1.26.4)
Requirement already satisfied: packaging>=20.0 in /usr/local/lib/python3.10/dist-packages (from matplotlib) (24.1)
Requirement already satisfied: pillow>=6.2.0 in /usr/local/lib/python3.10/dist-packages (from matplotlib) (9.4.0)
Requirement already satisfied: pyparsing>=2.3.1 in /usr/local/lib/python3.10/dist-packages (from matplotlib) (3.1.4)
Requirement already satisfied: python-dateutil>=2.7 in /usr/local/lib/python3.10/dist-packages (from matplotlib) (2.8.2)
Requirement already satisfied: six>=1.5 in /usr/local/lib/python3.10/dist-packages (from python-dateutil>=2.7->matplotlib) (1.16.0)
```

```
yield_Apples=[0.005,0.91,0.019,0.926,0.931]
```

```
import matplotlib.pyplot as plt
```

```
plt.plot(yield_Apples)
```

```
[<matplotlib.lines.Line2D at 0x7a4871dc6b60>]
```

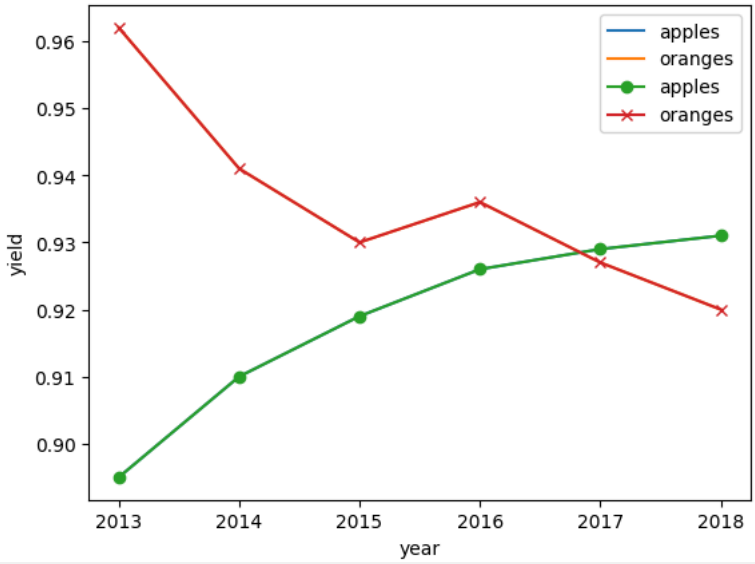



```
year=range(2000,2008)
apples=[0.895,0.91,0.919,0.926,0.939,0.934,0.937]
oranges=[0.962,0.941,0.930,0.918,0.907,0.901]
```

```
apples=[0.895,0.91,0.919,0.926,0.929,0.931]
oranges=[0.962,0.941,0.93,0.936,0.927,0.92]
```

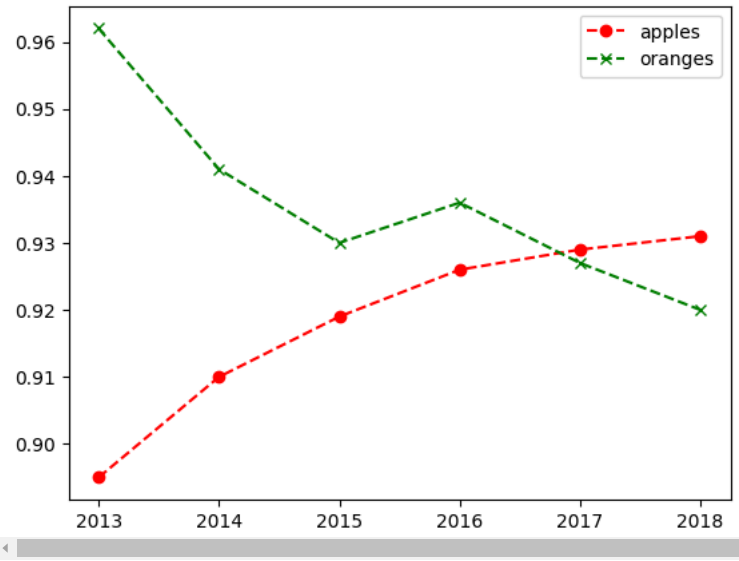
```
year=range(2013,2019)
apples=[0.895,0.91,0.919,0.926,0.929,0.931]
oranges=[0.962,0.941,0.93,0.936,0.927,0.92]

plt.plot(year,apples,label='apples')
plt.plot(year,oranges,label='oranges')
plt.legend()

plt.plot(year,apples,label='apples',marker='o')
plt.plot(year,oranges,label='oranges',marker='x')
plt.legend()
plt.xlabel('year')
plt.ylabel('yield')
```

```
Text(0, 0.5, 'yield')
```



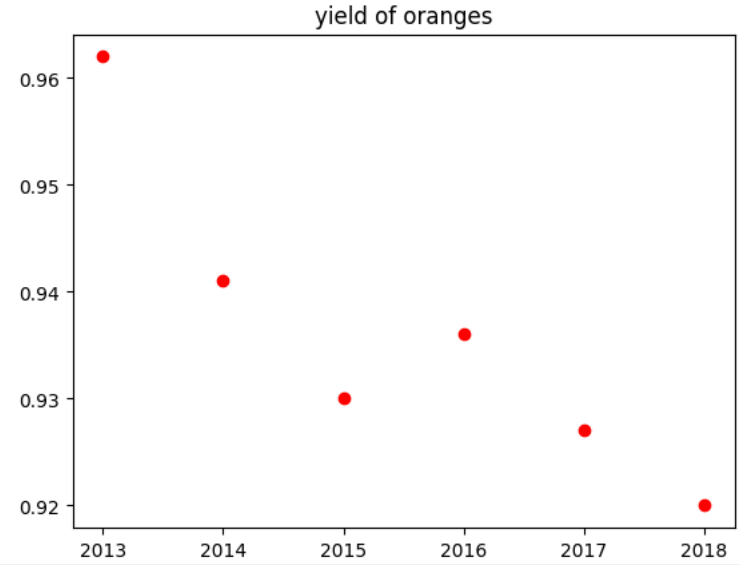

```
plt.plot(year,apples,marker='o',linestyle='--',color='r',label='apples')
plt.plot(year,oranges,marker='x',linestyle='--',color='g',label='oranges')
plt.legend()
```

```
<matplotlib.legend.Legend at 0x7a487199ad70>
```



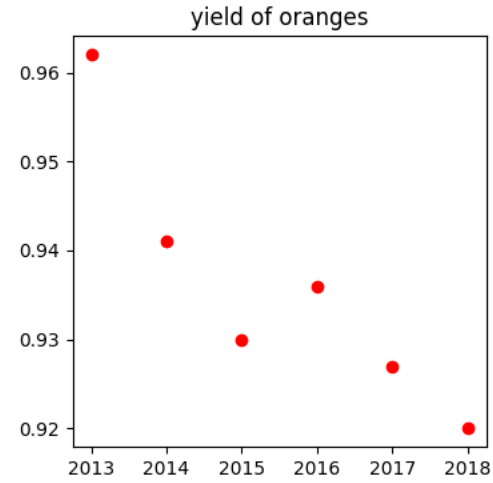

```
plt.plot(year,oranges,'or')
plt.title('yield of oranges')
```

```
Text(0.5, 1.0, 'yield of oranges')
```



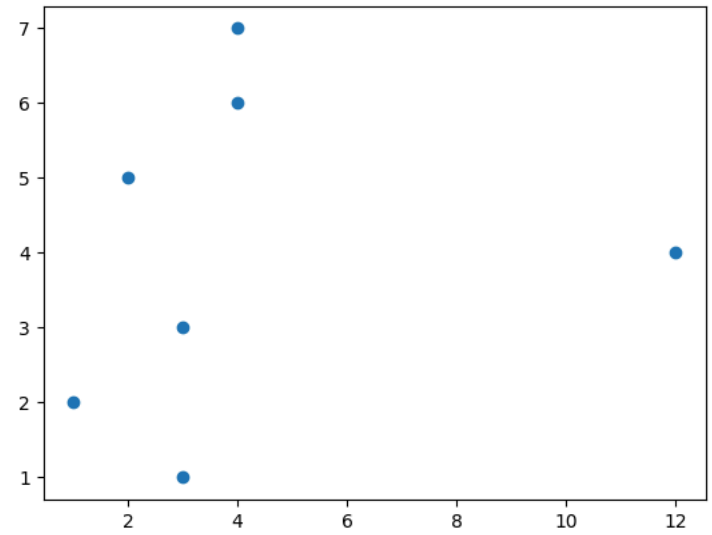

```
plt.figure(figsize=(4,4))
plt.plot(year,oranges,'or')
plt.title('yield of oranges')
```

```
Text(0.5, 1.0, 'yield of oranges')
```




```
x=[3,1,3,12,2,4,4]
y=[3,2,1,4,5,6,7]
plt.scatter(x,y)
```

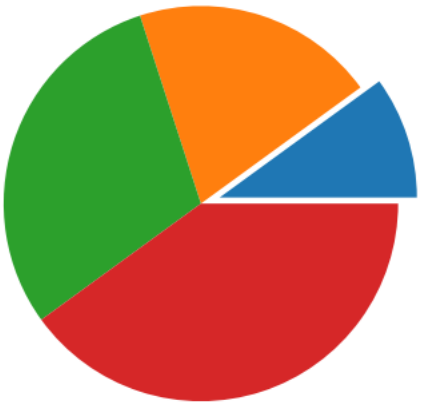
```
<matplotlib.collections.PathCollection at 0x7a4871cd4be0>
```




```
x=[1,2,3,4]
e=(0.1,0,0,0)
```

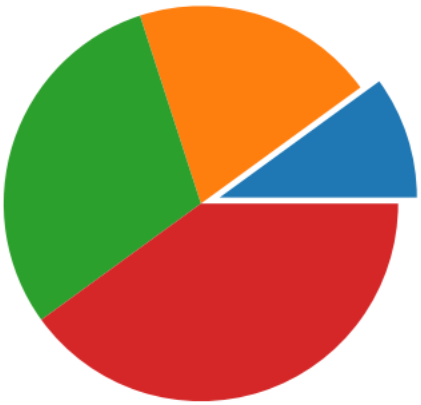
```
plt.pie(x,explode=e
```

```
([<matplotlib. atches.Wedge at 0x7a4871897a00>,
  <matplotlib.patches.Wedge at 0x7a4871897910>,
  <matplotlib.patches.Wedge at 0x7a48718122c0>,
  <matplotlib.patches.Wedge at 0x7a4871812830>],
 [Text(1.1412678178182487, 0.3708203985925972, ''),
  Text(0.33991867422268784, 1.0461621742897658, ''),
  Text(-1.0461621902025062, 0.3399186252483017, ''),
  Text(0.3399188211458418, -1.0461621265515308, '')])
```



```
x=[1,2,3,4]
e=(0.1,0,0,0)
plt.pie(x,explode=e)
```

```
([<matplotlib.patches.Wedge at 0x7a4871554ac0>,
  <matplotlib.patches.Wedge at 0x7a48715549d0>,
  <matplotlib.patches.Wedge at 0x7a4871555270>,
  <matplotlib.patches.Wedge at 0x7a48715556f0>],
 [Text(1.1412678178182487, 0.3708203985925972, ''),
  Text(0.33991867422268784, 1.0461621742897658, ''),
  Text(-1.0461621902025062, 0.3399186252483017, ''),
  Text(0.3399188211458418, -1.0461621265515308, '')])
```



Start coding or generate with AI.