```
### intstall-=> pip install numpy
import numpy as np

### Simple Calculations
print(np.add(2,3))
print(np.multiply(2,3))
print(np.divide(2,3))


### Numpy array
a = np.array([1,2,3,4,5])
print(a)

### Search in numpy Array
v = np.array([3,4,5,6,-5,3,2,0])
w = np.where(v==-5)
print(w) #(array([4]),) <- find the index of the element
print(np.where(v%2 == 0)) #(array([1, 3, 6, 7]),)

## Sort()
print(np.sort(v)) #[-5  0  2  3  3  4  5  6]

## 1D join arrays
x = np.array([5, 4, 13])
y = np.array([0, 3, 2])

array = np.stack((x, y), axis=1) # paired horizontally
print(array)
'''
[[ 5  0]
 [ 4  3]
 [13  2]]
 '''
print(array.shape) # (3,2) => 2D array


array = np.stack((x, y), axis=0)  # paired vertically
print(array)

'''
[[ 5  4 13]
 [ 0  3  2]]
 '''
print(array.shape) # (2,3)

print(np.dstack((x, y)))
'''
[[[ 5  0]
  [ 4  3]
  [13  2]]]
'''
print(np.dstack((x, y)).shape) # (1, 3, 2)

print(np.hstack((x,y))) # (6,)
'''
[ 5  4 13  0  3  2]
 '''
print(np.hstack((x,y)).shape) # (2,3)


print(np.vstack((x,y))) # vertically stack arrays
'''
[[ 5  4 13]
 [ 0  3  2]]
```

```
 '''
print(np.vstack((x,y)).shape) # (2,3)


a=np.array([[1,2,3,4,5,6],[2,2,3,4,5,5]])
print(a.shape)
d=a.reshape(3,4)
print(d.shape)
print(d)

##Join two 2D arrays
a1=np.array([[1,2,3,4,5],[11,22,33,44,55]])
a2=np.array([[0,9,8,7,6],[00,99,88,77,66]])
print(a1.shape) # (2,5)
print(a2.shape) #(2,5)

mya=np.concatenate((a1,a2),axis=1) #  [[ 1  2  3  4  5  0  9  8  7  6]
                                        # [11 22 33 44 55  0 99 88 77 66]]
print(mya)
print(mya.shape) #(2,10)

mya2=np.concatenate((a1,a2),axis=0)
print(mya2)
'''
[[ 1  2  3  4  5]
 [11 22 33 44 55]
 [ 0  9  8  7  6]
 [ 0 99 88 77 66]]
'''
print(mya2.shape)# (4,5)




#### Random Number
print(np.random.randint(100)) # 0 to 100 (Integer)
print(np.random.rand()) # float 0-1


### intstall-=> pip install matplotlib

import matplotlib.pyplot as plt
import numpy as np

### Plotting ###
x = np.array([1, 2, 3, 10])
y = np.array([3,4,5,6])
plt.plot(x, y)
plt.show()

plt.plot(x, y, linestyle = 'dashed')
plt.show()

x = np.array(["KIA", "Honda","Toyota", "Mazda"])
y = np.array([100000, 200733, 30000, 20000])
plt.bar(x, y, color="red")
plt.show()

plt.pie(y, labels=x)
plt.show()
```