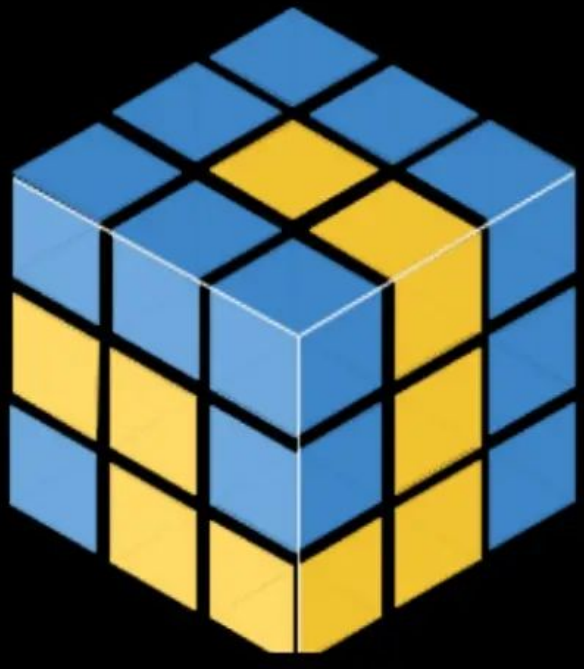
Quick Guide On
Python NumPy



01

Introduction:

NumPy stands for numerical python and it is the core library for numeric and scientific computing.

```
pip install numpy
```

pip command to install numpy in your system.

02

Creating Numpy Arrays

```python
import numpy as np
# creating numpy array

# Single-Dimensional array
array_1 = np.array([10, 20, 30, 40, 50])

# Multi-Dimensional array
array_2 = np.array([[10, 20, 30], [40, 50, 60]])

print("1D array : \n",array_1)
print("2D array : \n",array_2)
```

Code to create Numpy array using lists.

```
1D array :
 [10 20 30 40 50]

2D array :
 [[10 20 30]
 [40 50 60]]
```

03

Creating Arrays Using Functions:

```python
# numpy functions to create and initialize arrays
import numpy as np

# full((row, column), fill_value), returns: 2D array
n1_array = np.full((2,2), 3)
print("Using full function: \n",n1_array)

# zeros((row, column)), retunrs: 2D array with 0 as default value
n2_array = np.zeros((2,2))
print("Using zeros function: \n",n2_array)

# arange(start, stop, [step]), stop is exclusive, returns: 1D array
n3_array = np.arange(10,15)
print("Using arange function: \n",n3_array)

# random.rand_int(start, stop,total_element), stop is exclusive,
# returns: 1D array
n4_array = np.random.randint(10,20, 5)
print("Using random.randint function: \n",n4_array)
```

NumPy functions to create and initialize arrays.

```
Using full function:
 [[3 3]
 [3 3]]
Using zeros function:
 [[0. 0.]
 [0. 0.]]
Using arange function:
 [10 11 12 13 14]
Using random.randint function:
 [13 11 14 19 15]
```

04

Array Shape:

To check the shape of a NumPy array we can use the shape attribute and to change its shape we can use shape and reshape funnction.

```python
import numpy as np

array1 = np.array([[1, 2, 3], [4, 5, 6]])
print(array1)
print("Shape of array: ",array1.shape) # return (row, column)

# changing shape of array
# using shape
array1.shape = (3, 2)
print(array1)
print("Shape of array: ",array1.shape)

# using reshape function
array2 = array1.reshape(1,6)
print(array2)
print("Shape of array: ",array2.shape)
```

```
[[1 2 3]
 [4 5 6]]
Shape of array:  (2, 3)

[[1 2]
 [3 4]
 [5 6]]
Shape of array:  (3, 2)

[[1 2 3 4 5 6]]
Shape of array:  (1, 6)
```

05

Numpy Statistical functions

```
import numpy as np

np_array = np.random.randint(10, 20, 10)
print(np_array)

# mean
print("Mean = ",np.mean(np_array))

# median
print("Median = ",np.median(np_array))

# Standard Deviation
print("Std Deviation = ",np.std(np_array))

# cumulative sum
print("cumulative sum  = ",np.cumsum(np_array))
```

```
[15 19 19 12 16 19 13 18 17 18]
Mean =  16.6
Median =  17.5
Std Deviation =  2.4166091947189146
cumulative sum  =  [ 15  34  53  65...]
```