CHINMAYA VIDYALAYA TARAPUR

Std: XII **Subject: Informatics Practices**

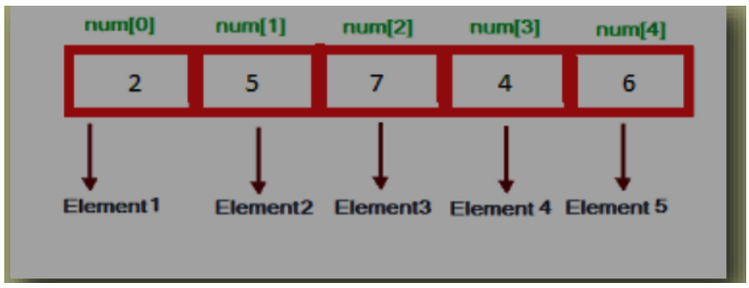
Chapter 1: Numpy Array

1. What is Numpy Array?

Ans: NumPy stands for Numerical Python.It is the core library for scientific computing in Python. It consist of multidimensional array objects, and tools for working with these arrays. Arrays Numpy Array is a grid of values with same type, and is indexed by a tuple of nonnegative integers. The number of dimensions of it ,is the rank of the array; the shape of an array depends upon a tuple of integers giving the size of the array along each dimension.

2. What is 1D array?

1 D ARRAY can be single or multidimensional. The number of subscript/index determines dimensions of the array. An array of one dimension is known as a one-dimensional array or 1-D array



In above diagram num is an array ,it's first element is at 0 index position ,next element is at 1 and so on till last element at n-1 index position.At 0 index position value is 2 and at 1 index position value is 5.

3. How will create a 1D array?

Creation of 1D array One dimension array can be created using array method with list object with one dimensional elements.

e.g.program

```
import numpy as np
a = np.array([500, 200, 300])          # Create a 1D Array
print(type(a))                         # Prints " <class ' numpy.ndarray'>"
print(a.shape)                         # Prints "(3,)" means dimension of array
print(a[0], a[1], a[2])                # Prints "500 200 300"
a[0] = 150                             # Change an element of the array
print(a)
```

4. Write Python code to create 1 D ARRAY using different numpy functions .

```
import numpy as np
p = np.empty(5)                # Create an array of 5 elements with random values
print(p)
a1 = np.zeros(5)               # Create an array of all zeros float values
print(a1)                      # Prints "[0. 0. 0. 0. 0.]"
a2 = np.zeros(5, dtype = np.int)   # Create an array of all zeros int values print(a2)
                               # Prints "[0. 0. 0. 0. 0.]"
b = np.ones(5)                 # Create an array of all ones
print(b)                       # Prints "[1. 1. 1. 1. 1.]"
c = np.full(5, 7)              # Create a constant array
print(c)                       # Prints "[7 7 7 7 7]"
e= np.random.random(5)         # Create an array filled with random values
print(e)
```

5. What is the difference between Numpy array and list.

NUMPY ARRAY	LIST
Numpy Array works on homogeneous types	Python list are made for heterogeneous types
Python list support adding and removing of elements	numpy.Array does not support adding and removing of elements
Can't contain elements of different types	can contain elements of different types
smaller memory consumption	more memory consumption
better runtime	Runtime not speedy

6. How will you create an array from already existing array?
Create 1D from array Copy function is used to create the copy of the existing array.
e.g.program

```
import numpy as np
x = np.array([1, 2, 3])
y = x
z = np.copy(x)
x[0] = 10
print(x)
print(y)
print(z)
```

7. Write Python code to create 1D from string.

```
import numpy as np
data =np.fromstring('1 2', dtype=int, sep=' ')
print(data)
```

➢ In fromstring dtype and sep argument can be changed.

8. How will you create a numpy array from a given range?
We can create an array using numpy.arange(start, stop, step, dtype) function

```
#program 1
import numpy as np
x = np.arange(5)                    #for float value specify dtype = float as argument
print(x)                            #print [0 1 2 3 4]

#program 2
import numpy as np
x = np.arange(10,20,2)
print (x)                           #print [10 12 14 16 18]
```