Assignment-1

1. What makes NumPy.shape() different from NumPy.size()?

Solution:- The NumPy.shape() gives us the number of elements in each dimension of an array.

Example:-
```
import numpy

arr = numpy.array([[1, 2, 3, 4], [5, 6, 7, 8]])

print(numpy.shape(arr))
```

OUTPUT:-(2,4)

The NumPy.size() returns the size of a given array.

Example:-
```
import numpy

arr = numpy.array([[1, 2, 3, 4], [5, 6, 7, 8]])

print(numpy.size(arr))
```

OUTPUT:-8

2. In NumPy, describe the idea of broadcasting.

Solution:- broadcasting refers to the ability of NumPy to treat arrays of different shapes during arithmetic operations. Arithmetic operations on arrays are usually done on corresponding elements.
If the dimensions of two arrays are dissimilar, element-to-element operations are not possible. However, operations on arrays of non-similar shapes is still possible in NumPy, because of the broadcasting capability.

3. What makes Python better than other libraries for numerical computation?

Solution:-in Python there are so many library for numerical computation .

I am explaining some libraries:

(i) Pandas is the most important data analysis library of Python. Being open source, it is used for analysing data with Python.it consist so many math function like mean , median,mode ,count,std,min,max etc.

(ii) NumPy:- Numpy assures accurate calculations with matrices and arrays.it consist mathematical function for calculation.

(iii) Natural language toolkit:- library for mathematical analysis

4. How does NumPy deal with files?

Solution:- The ndarray objects can be saved to and loaded from the disk files. The IO functions available are −

- **load()** and **save()** functions handle /numPy binary files (with **npy** extension)
- **loadtxt()** and **savetxt()** functions handle normal text files.

NumPy introduces a simple file format for ndarray objects. This **.npy** file stores data, shape, dtype and other information required to reconstruct the ndarray in a disk file such that the array is correctly retrieved even if the file is on another machine with different architecture.

```
Example:- import numpy as np
    a = np.array([1,2,3,4,5])
    np.save('outfile',a)
```

5. Mention the importance of NumPy.empty().

Solution:- The empty() function is used to create a new array of given shape and type, without initializing entries.

```
Example:-
         import numpy as np
        np.empty(2)
        array([  6.95033087e-310,   1.69970835e-316])
```