



Vidyavardhini's College of Engineering & Technology

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Experiment No. 9
Program to manipulate arrays using NumPy
Date of Performance:
Date of Submission:



## Experiment No. 9

**Title:** Program to manipulate arrays using NumPy

**Aim:** To study and implement arrays manipulation using NumPy

**Objective:** To introduce NumPy package

### Theory:

**Numpy** is a general-purpose array-processing package. It provides a high-performance multidimensional array object, and tools for working with these arrays. It is the fundamental package for scientific computing with Python.

Besides its obvious scientific uses, Numpy can also be used as an efficient multi-dimensional container of generic data.

### *Arrays in Numpy*

Array in Numpy is a table of elements (usually numbers), all of the same type, indexed by a tuple of positive integers. In Numpy, number of dimensions of the array is called rank of the array. A tuple of integers giving the size of the array along each dimension is known as shape of the array. An array class in Numpy is called as **ndarray**. Elements in Numpy arrays are accessed by using square brackets and can be initialized by using nested Python Lists.

### Creating a Numpy Array

Arrays in Numpy can be created by multiple ways, with various number of Ranks, defining the size of the Array. Arrays can also be created with the use of various data types such as lists, tuples, etc. The type of the resultant array is deduced from the type of the elements in the sequences.

**Note:** Type of array can be explicitly defined while creating the array.

### Code:

```
import numpy
np = numpy.array([1,2,3,4,5])
x = int(input("enter the index of the number you want too search: "))
print("Element:",np[x])
total = sum(np)
print("sum:",total)
```



**output:**

enter the index of the number you want to search: 3

Element: 4

sum: 15

**Conclusion:**

The experiment involves manipulating a 1D array using NumPy. We first added 2 to each element of the array and then multiplied each element by 3. Finally, we found the sum of all elements in the array. This experiment demonstrates the ease of performing mathematical operations on arrays using NumPy.