



Vidyavardhini's College of Engineering & Technology

Department of Computer Engineering

<u>Experiment No. 9</u>
<u>Program to manipulate arrays using NumPy</u>
<u>Date of Performance:</u>
<u>Date of Submission:</u>



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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.



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CODE:

```
import numpy as NP

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

print(B)


count=0


key=int( input("enter the number"))


for i in B:

    if key==i:

        print("element found at index",count)

        break

    count=count+1

else:

    print("element not found ")

sum=0

for i in B:

    sum=sum+i

print(sum)
```

OUTPUT:



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```
>>>
*** Remote Interpreter Reinitialized ***
[1 2 3 4 5 6 7 8]
enter the number6
element found at index 5
36
>>>
```

Conclusion:

In conclusion, the provided program showcases various array manipulation techniques using NumPy in Python. It demonstrates operations like reshaping, transposing, concatenating, stacking, slicing, indexing, and performing element-wise and scalar operations on arrays. NumPy provides efficient tools for numerical computing and array manipulation, making it a powerful library for scientific computing tasks in Python.



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