

P S SENIOR SECONDARY SCHOOL

INFORMATICS PRACTICES-NUMPY-WORKSHEET-I

- 1) What is the relationship between the rank of an array and the shape of the array?
- 2) What are array slices?
- 3) Write a code to extract elements in reverse order from array ARR which is created with the values ranging from 10 to 49 each spaced with a difference of three. The extracted elements should be spaced with 2 elements in between in the original array i.e., every 3rd element.

$$4) A = \begin{pmatrix} 1 & 1 & 2 \\ 3 & 5 & 8 \\ 13 & 21 & 34 \end{pmatrix} \quad B = \begin{pmatrix} 0 & 9 \\ 3 & 12 \\ 6 & 15 \end{pmatrix} \quad X = \begin{pmatrix} 1 \\ 3 \\ 2 \end{pmatrix} \quad Y = [1 \ 3 \ 2]$$

Write the commands along with the output to accomplish the following

- a) Array A's product of 2
 - b) Array B divided by 3
 - c) Array A's product with array X
 - d) Array Y's product with array A
- 5) An ndarray X contains the following data:
- ```
[[0 1 2 3]
 [4 5 6 7]
 [8 9 10 11]
 [12 13 14 15]]
```

What will be the returned by the statements?

- a) `print(x[0:2 , 0:2])`
- b) `print(x[2:0 , 2:0])`
- c) `print (x[ 2:0:-1 , 2:0:-1 ])`
- d) Extract horizontal rows separately
- e) Vertical columns separately
- f) `x[:2 , :3]`
- g) `x[:3 , :: 2]`
- f) `x[ :: -1 , :: -1]`

6) Create a 3x4 array X with values ranging from 1 to 13 and another 3x4 array Y with values ranging from 14 to 25. Concatenate array X and array Y

- a) Row wise,
- b) Column wise

7) Consider the Ndarrays X and Y given in the previous question . What will be the resultant array , if the following methods are used

- a) `hstack( )`
- b) `vstack( )`

8) Explain covariance in numpy array along with an example

9) Explain variance in numpy array along with an example

10) Explain correlation in numpy array along with an example

11) Difference between Numpy array and python list

12) Predict the output of the following code fragment

```
X= [1, 2, 3, 99, 3, 2, 1]
X1, X2 , X3 = np. split(X , [3 ,5])
print(X1, X2 ,X3)
```

13) Explain Mean and Median functions in Numpy.

14) Write a Numpy program to covert a 2D array of shape 5x6 in to 1D with 2 rows from the 2D array.

15) Write a Numpy program to create a random array with 1000 elements and compute the average, variance , standard deviation of the array elements

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