

Python NumPy Exercise

Nguồn: <https://pynative.com>

Lưu ý:

- Các bài tập dưới đây để luyện tập kỹ năng sử dụng thư viện Numpy.
- Các em nên tự làm trước
- Trường hợp cần giúp đỡ, truy cập vào website nguồn ở trên để xem solution.

Exercise 1: Create a 4X2 integer array and Prints its attributes

Note: The element must be a type of unsigned int16. And print the following Attributes: –

- The shape of an array.
- Array dimensions.
- The Length of each element of the array in bytes.

Expected Output:

```
Printing Array

[[64392 31655]
 [32579    0]
 [49248  462]
 [    0    0]]

Printing NumPy array Attributes

Array Shape is: (4, 2)
Array dimensions are 2
Length of each element of array in bytes is 2
```

Exercise 2: Create a 5X2 integer array from a range between 100 to 200 such that the difference between each element is 10

Expected Output:

```
Creating 5X2 array using numpy.arange

[[100 110]
 [120 130]
 [140 150]
 [160 170]
 [180 190]]
```

Exercise 3: Following is the provided numPy array. Return array of items by taking the third column from all rows

```
sampleArray = numpy.array([[11 ,22, 33], [44, 55, 66], [77, 88, 99]])
```

Expected Output:

```
Printing Input Array
[[11 22 33]
 [44 55 66]
 [77 88 99]]

Printing array of items in the third column from all rows
[33 66 99]
```

Exercise 4: Return array of odd rows and even columns from below numpy array

```
sampleArray = numpy.array([[3 ,6, 9, 12], [15 ,18, 21, 24],
 [27 ,30, 33, 36], [39 ,42, 45, 48], [51 ,54, 57, 60]])
```

Expected Output:

```
Printing Input Array
[[ 3  6  9 12]
 [15 18 21 24]
 [27 30 33 36]
 [39 42 45 48]
 [51 54 57 60]]

Printing array of odd rows and even columns
[[ 6 12]
 [30 36]
 [54 60]]
```

Exercise 5: Create a result array by adding the following two NumPy arrays. Next, modify the result array by calculating the square of each element

```
arrayOne = numpy.array([[5, 6, 9], [21 ,18, 27]])
arrayTwo = numpy.array([[15 ,33, 24], [4 ,7, 1]])
```

Expected Output:

```
addition of two arrays is

[[20 39 33]
 [25 25 28]]

Result array after calculating the square root of all elements

[[ 400 1521 1089]
 [ 625  625  784]]
```

Exercise 6: Split the array into four equal-sized sub-arrays

Note: Create an 8X3 integer array from a range between 10 to 34 such that the difference between each element is 1 and then Split the array into four equal-sized sub-arrays.

Expected Output:

```
Creating 8X3 array using numpy.arange
[[10 11 12]
 [13 14 15]
 [16 17 18]
 [19 20 21]
 [22 23 24]
 [25 26 27]
 [28 29 30]
 [31 32 33]]

Dividing 8X3 array into 4 sub array

[array([[10, 11, 12],[13, 14, 15]]),
 array([[16, 17, 18],[19, 20, 21]]),
 array([[22, 23, 24],[25, 26, 27]]),
 array([[28, 29, 30],[31, 32, 33]])]
```

Exercise 7: Sort following NumPy array

- **Case 1:** Sort array by the second row
- **Case 2:** Sort the array by the second column

```
sampleArray = numpy.array([[34,43,73],[82,22,12],[53,94,66]])
```

Expected Output:

```
Printing Original array
[[34 43 73]
 [82 22 12]
 [53 94 66]]

Sorting Original array by second row
[[73 43 34]
 [12 22 82]
 [66 94 53]]

Sorting Original array by second column
[[82 22 12]
 [34 43 73]
 [53 94 66]]
```

Exercise 8: Print max from axis 0 and min from axis 1 from the following 2-D array.

```
sampleArray = numpy.array([[34,43,73],[82,22,12],[53,94,66]])
```

Expected Output:

```
Printing Original array
[[34 43 73]
 [82 22 12]
 [53 94 66]]

Printing amin Of Axis 1
[34 12 53]

Printing amax Of Axis 0
[82 94 73]
```

Exercise 9: Delete the second column from a given array and insert the following new column in its place.

```
sampleArray = numpy.array([[34,43,73],[82,22,12],[53,94,66]])
newColumn = numpy.array([[10,10,10]])
```

Expected Output:

```
Printing Original array
```

```
[[34 43 73]
 [82 22 12]
 [53 94 66]]
```

```
Array after deleting column 2 on axis 1
```

```
[[34 73]
 [82 12]
 [53 66]]
```

```
Array after inserting column 2 on axis 1
```

```
[[34 10 73]
 [82 10 12]
 [53 10 66]]
```

Exercise 10: Create two 2-D arrays and Plot them using matplotlib