

how to import numpy

```
In [5]: import numpy as np

arr=np.array([1,2,3,4,5,5])

print(arr)

[1 2 3 4 5 5]
```

checking numpy version

```
In [7]: import numpy as np

print(np.__version__)

1.24.3
```

Create a NumPy ndarray Object

NumPy is used to work with arrays. The array object in NumPy is called ndarray.

We can create a NumPy ndarray object by using the array() function.

```
In [ ]: import numpy as np

arr = np.array([1, 2, 3, 4, 5])

print(arr)

print(type(arr))
```

```
In [9]: import numpy as np
```

```
arr = np.array(("a", "c", 3))
```

```
print(arr)
```

```
['a' 'c' '3']
```

```
In [11]: import numpy as np
```

```
arr = np.array((1, 2, 3, 4, 5))
```

```
print(arr)
```

```
[1 2 3 4 5]
```

Dimensions in Arrays

0-D Arrays

```
In [13]: import numpy as np
```

```
arr = np.array(42)
```

```
print(arr)
```

```
42
```

1-D Arrays

```
In [14]: import numpy as np
```

```
arr = np.array([1, 2, 3, 4, 5])
```

```
print(arr)
```

```
[1 2 3 4 5]
```

2-D Arrays

```
In [29]: import numpy as np
```

```
#
```

```
arr = np.array([[1, 2, 3], [4, 6, 7]])
```

```
print(arr)
print(type(arr))
print()
print(arr.shape)
```

```
[[1 2 3]
 [4 6 7]]
<class 'numpy.ndarray'>
```

```
(2, 3)
```

3-D arrays

```
In [31]: import numpy as np
#2*(2*3)
arr = np.array([[[2,5,6],[6,8,9]],[[1,3,4],[6,5,4]]])

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

```
[[[2 5 6]
  [6 8 9]]
```

```
 [[1 3 4]
  [6 5 4]]]
```

```
(2, 2, 3)
```

Check Number of Dimensions?

```
In [20]: import numpy as np
a = np.array(42)
b = np.array([1,2,3,4,5])
c = np.array([1,2,3],[4,5,6])
d = np.array([1, 2, 3], [4, 5, 6], [[1, 2, 3], [4, 5, 6]])
print(a.ndim)
print(b.ndim)
print(c.ndim)
print(d.ndim)
```

```
0
1
2
3
```

Higher Dimensional Arrays

```
In [19]: import numpy as np

arr = np.array([1, 2, 3, 4], ndmin=5)

print(arr)
print('number of dimensions :', arr.ndim)

[[[[[1 2 3 4]]]]]
number of dimensions : 5
```

NumPy Array Indexing

You can access an array element by referring to its index number.

```
In [21]: #Get the first element from the following array
import numpy as np

arr = np.array([1, 2, 3, 4])

print(arr[0])

1
```

```
In [22]: #Get the second element from the following array.
import numpy as np

arr = np.array([1, 2, 3, 4])

print(arr[1])

2
```

```
In [32]: #Get third and fourth elements from the following array and add them.
import numpy as np

arr = np.array([1, 2, 3, 4])

print(arr[2] + arr[3])

7
```

Access 2-D Arrays

```
In [36]: import numpy as np
         #array starts with 0
         arr = np.array([[1,2,3,4,5], [6,7,8,9,10]])

         print('2nd element on 1st row: ', arr[1, 3])
```

2nd element on 1st row: 9

```
In [37]: import numpy as np
         arr=np.array([[1,2,3,4,5],[6,7,8,9,10]])
         print("5th element on 2nd row:",arr[1,4])
```

5th element on 2nd row: 10

Access 3-D Arrays

```
In [40]: import numpy as np

         arr = np.array([[[1, 2, 3], [4, 5, 6]], [[7, 8, 9], [10, 11, 12]]])

         print(arr[0, 1, 2])
```

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Negative Indexing

```
In [45]: import numpy as np

         arr = np.array([[1,2,3,4,5], [6,7,8,9,10]])

         print('Last element from 2nd dim: ', arr[1, -4])
```

Last element from 2nd dim: 7