

```
In [1]: #To Check version of numpy
import numpy as np
print(np.__version__)
```

1.26.4

```
In [2]: #To Find any non-zero elements in an array
import numpy as np
x=np.array([1,0,0,0])
print(np.any(x))
y=np.array([0,0,0,0])
print(np.any(y))
```

True  
False

```
In [3]: #To Find Finiteness of an array
import numpy as np
x=np.array([1,0,np.nan,np.inf])
print(x)
print("Test the finiteness of elements of an array:")
print(np.isfinite(x))
```

[ 1. 0. nan inf]  
Test the finiteness of elements of an array:  
[ True True False False]

```
In [4]: #To Test element-wise positive or negative infinity
import numpy as np
x=np.array([1,-2,np.inf,-np.inf,0,3.5])
result_posinf=np.isposinf(x)
result_neginf=np.isneginf(x)
print(result_posinf)
print(result_neginf)
```

[False False True False False]  
[False False False True False False]

```
In [5]: #To print an array in a range
import numpy as np
arr=np.arange(30,71)
print(arr)
```

[30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53  
54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70]

```
In [6]: #To print an array of even numbers in a range
import numpy as np
arr=np.arange(30,71,2)
print(arr)
```

[30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62 64 66 68 70]

```
In [7]: #To print a 3x3 identity matrix
import numpy as np
arr=np.identity(3)
print(arr)
```

```
[[1. 0. 0.]
 [0. 1. 0.]
 [0. 0. 1.]]
```

```
In [8]: #To create a 5x5 diagonal matrix
import numpy as np
arr=np.diag([1,2,3,4,5])
print(arr)
```

```
[[1 0 0 0 0]
 [0 2 0 0 0]
 [0 0 3 0 0]
 [0 0 0 4 0]
 [0 0 0 0 5]]
```

```
In [12]: #To generate a matrix products of two arrays
import numpy as np
x=np.array([[1,0],[1,1]])
y=np.array([[3,1],[2,2]])
print("Matrix Products")
print(np.dot(x,y))
print("To cross-check")
print(np.matmul(x,y))
print("Matrix addition")
print(np.add(x,y))
print("Matrix Subtraction")
print(np.subtract(x,y))
```

Matrix Products

```
[[3 1]
 [5 3]]
```

To cross-check

```
[[3 1]
 [5 3]]
```

Matrix addition

```
[[4 1]
 [3 3]]
```

Matrix Subtraction

```
[[ -2 -1]
 [ -1 -1]]
```

```
In [1]: #To find mean of an array
import numpy as np
arr=np.array([10,20,30,40,50])
print(np.mean(arr))
```

30.0

```
In [5]: #To find mean of axis of an array
import numpy as np
arr=np.array([[10,30],[20,60]])
print(arr)
print("Mean of Each Column")
print(arr.mean(axis=0))
print("Mean of Each Rows")
print(arr.mean(axis=1))
```

```
[[10 30]
 [20 60]]
```

Mean of Each Column

```
[15. 45.]
```

Mean of Each Rows

[20. 40.]

```
In [2]: #To create an array in a range  
import numpy as np  
arr=np.arange(0,10)  
print(arr)
```

[0 1 2 3 4 5 6 7 8 9]

```
In [17]: #To convert 1D array to 2D array  
import numpy as np  
arr=np.array([10,20,30,40,50,60])  
arr_2D=arr.reshape(2,3)  
arr_3D=arr.reshape(3,1,2)  
print("Original 1D array:")  
print(arr)  
print("2D array thus created:")  
print(arr_2D)  
print("3D array created:")  
print(arr_3D)
```

Original 1D array:

[10 20 30 40 50 60]

2D array thus created:

[[10 20 30]

[40 50 60]]

3D array created:

[[[10 20]]

[[30 40]]

[[50 60]]]