

Numpy

Importing

```
import numpy as np
```

Numpy Array

```
1. a = np.array([1,2,3])
2. my_matrix = [[1,2,3],[4,5,6],[7,8,9]]
b = np.array(my_matrix)
m = np.asmatrix(b)
```

```
.ndim type(b)
```

Methods

```
np.zeros(3) np.zeros(3,3)
```

```
np.ones()
```

```
np.arange(0,10)
```

```
np.linspace(0,10)
```

```
np.eye(2)
```

Random Number Generation

```
np.random.rand()
```

```
np.random.randn()
```

```
np.random.randint(0,50,10)
```

Reshaping

```
arr = np.arange(25)
```

```
arr.reshape(5,5)
```

max

```
ranarr = np.random.randint(0,50,10)
ranarr.max()
ranarr.argmax()
```

Slicing

```
arr = np.arange(25)
slice_of_arr = arr[0:6]
```

Broadcasting

```
arr[0:6]=100
```

Copy

```
arr_copy = arr.copy()
```

Indexing

```
arr[8]
arr_2d = arr.reshape(5,5)
arr_2d[:2,:1]
```

Operations

```
arr>4
arr[arr>4]
arr+100
```

Operation with 0 as an element

```
arr[0]=0
arr/arr
np.sqrt(arr)
np.argmax(arr)
np.max(arr)

mat=np.arange(1,26).reshape(5,5)
mat[2:,1:]
mat.sum()
mat.sum(axis=0)
```

np.dot()

```
x = np.array([[1,2],[3,4]])
y = np.array([[5,6],[7,8]])

v = np.array([9,10])
w = np.array([11, 12])
x+v

v.dot(w)
v@w
np.dot(v,w)
```

	A_1	A_2
1	1	2
2	3	4

Fractional ▾	
	B_1
1	9
2	10

	C_1
1	29
2	67

`np.multiply()`

```
print(v*w)
print(np.multiply(v, w))

print(v.T)
```

Operations on 2d

```
#Set up matrix
arr2d = np.zeros((10,10))

#Length of array
arr_length = arr2d.shape[1]

#Set up array

for i in range(arr_length):
    arr2d[i] = i

arr2d[arr2d>2]
```