# NumPy Library: Complete Modules, Functions & Examples

This document contains a comprehensive list of functions from the NumPy library with syntax examples.

Function: array(object)

```
import numpy as np

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

print(arr)
```

Function: zeros(shape)

```
import numpy as np

print(np.zeros((2,2)))  # 2x2 array of zeros
```

Function: ones(shape)

```
import numpy as np

print(np.ones((3,3)))  # 3x3 array of ones
```

Function: arange(start, stop, step)

```
import numpy as np

print(np.arange(0, 10, 2))  # Array from 0 to 10 with step 2
```

Function: linspace(start, stop, num)

```
import numpy as np

print(np.linspace(1, 10, 5))  # 5 evenly spaced numbers
```

Function: eye(n)

```
import numpy as np

print(np.eye(3))  # 3x3 identity matrix
```

Function: random.rand(d0, d1, ...)

```
import numpy as np

print(np.random.rand(2,2))  # 2x2 random values
```

Function: random.randint(low, high, size)

```
import numpy as np

print(np.random.randint(1, 10, size=5))  # 5 random integers
```

Function: random.choice(a, size)

```
import numpy as np

print(np.random.choice([1, 2, 3, 4], size=3))
```

Function: random.shuffle(arr)

```
import numpy as np

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

np.random.shuffle(arr)

print(arr)
```

Function: add(x1, x2)

```
import numpy as np

print(np.add(3, 5))
```

Function: subtract(x1, x2)

```
import numpy as np

print(np.subtract(10, 4))
```

Function: multiply(x1, x2)

```
import numpy as np

print(np.multiply(2, 3))
```

Function: divide(x1, x2)

```
import numpy as np

print(np.divide(8, 2))
```

Function: sqrt(x)

```
import numpy as np

print(np.sqrt(16))
```

Function: exp(x)

```
import numpy as np

print(np.exp(2))  # e^2
```

Function: mean(a)

```
import numpy as np

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

print(np.mean(arr))
```

Function: median(a)

```
import numpy as np

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

print(np.median(arr))
```

Function: std(a)

```
import numpy as np

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

print(np.std(arr))
```

Function: var(a)

```
import numpy as np

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

```
print(np.var(arr))
```

Function: sum(a)

```
import numpy as np

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

print(np.sum(arr))
```

Function: dot(a, b)

```
import numpy as np

a = np.array([1, 2])

b = np.array([3, 4])

print(np.dot(a, b))  # Dot product
```

Function: matmul(a, b)

```
import numpy as np

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

b = np.array([[5, 6], [7, 8]])

print(np.matmul(a, b))
```

Function: inv(a)

```
import numpy as np

from numpy.linalg import inv

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

print(inv(mat))  # Inverse matrix
```

Function: save(file, arr)

```
import numpy as np

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

np.save('array.npy', arr)
```

Function: load(file)

```
import numpy as np

arr = np.load('array.npy')

print(arr)
```