

## **NUMPY COMPLETE CHEATSHEET**

### **IMPORT**

```
import numpy as np
```

### **ARRAY CREATION**

```
np.array()
```

```
np.asarray()
```

```
np.copy()
```

```
np.zeros()
```

```
np.ones()
```

```
np.empty()
```

```
np.full()
```

```
np.eye()
```

```
np.identity()
```

```
np.diag()
```

```
np.arange()
```

```
np.linspace()
```

```
np.logspace()
```

```
np.meshgrid()
```

```
np.indices()
```

```
np.frombuffer()
```

```
np.fromfile()
```

```
np.fromfunction()
```

### **RANDOM (np.random)**

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

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

```
np.random.randint()
```

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

```
np.random.uniform()
```

np.random.normal()  
np.random.binomial()  
np.random.choice()  
np.random.permutation()  
np.random.shuffle()  
np.random.seed()  
RNG (modern API)  
np.random.default\_rng()  
rng.random()  
rng.integers()  
rng.normal()  
rng.uniform()

## DTYPES

arr.dtype  
arr.astype()  
np.int32  
np.int64  
np.float32  
np.float64  
np.bool\_  
np.complex64  
np.str\_  
np.finfo()  
np.iinfo()

## ARRAY INFO

arr.shape  
arr.ndim  
arr.size  
arr.itemsize  
arr.nbytes  
arr.strides  
arr.T  
arr.real

arr.imag  
arr.flat  
arr.flags

## INDEXING & SLICING

arr[i]  
arr[i:j]  
arr[i:j:k]  
arr[:, :]  
arr[:, 0]  
arr[0, :]  
arr[..., 1]  
arr[[1,5,7]]  
arr[arr > 0]  
np.where()  
np.take()  
np.put()  
np.nonzero()  
np.extract()  
np.choose()

## RESHAPING & DIMENSIONS

arr.reshape()  
arr.ravel()  
arr.flatten()  
arr.squeeze()  
np.expand\_dims()  
arr[..., np.newaxis]  
np.newaxis  
np.resize()  
arr.resize()  
np.transpose()  
np.moveaxis()  
np.swapaxes()

## MERGING & SPLITTING

np.concatenate()  
np.stack()  
np.vstack()  
np.hstack()  
np.dstack()  
np.column\_stack()  
np.row\_stack()  
np.block()  
np.split()  
np.array\_split()  
np.hsplit()  
np.vsplit()  
np.dsplit()

## ELEMENTWISE ARITHMETIC

np.add()  
np.subtract()  
np.multiply()  
np.divide()  
np.power()  
np.mod()

## BASIC MATH FUNCTIONS

np.abs()  
np.round()  
np.floor()  
np.ceil()  
np.trunc()  
np.sign()

## ADVANCED MATH

np.exp()  
np.log()  
np.log2()

np.log10()  
np.sqrt()  
np.square()  
np.sin()  
np.cos()  
np.tan()  
np.arcsin()  
np.arccos()  
np.arctan()  
np.arctan2()  
np.sinh()  
np.cosh()  
np.tanh()  
np.minimum()  
np.maximum()  
np.clip()

## STATISTICS

np.mean()  
np.median()  
np.std()  
np.var()  
np.sum()  
np.prod()  
np.min()  
np.max()  
np.argmin()  
np.argmax()  
np.percentile()  
np.quantile()  
np.cumsum()  
np.cumprod()

## LINEAR ALGEBRA (np.linalg)

np.linalg.dot()

np.dot()  
np.matmul()  
np.vdot()  
np.inner()  
np.outer()  
np.tensordot()  
np.linalg.norm()  
np.linalg.inv()  
np.linalg.det()  
np.linalg.eig()  
np.linalg.eigh()  
np.linalg.svd()  
np.linalg.solve()  
np.linalg.matrix\_rank()

## BROADCASTING

np.broadcast()  
np.broadcast\_to()  
np.expand\_dims()  
arr.reshape()  
(arr reshaping for compatible dims)

## SORTING

np.sort()  
arr.sort()  
np.argsort()  
np.partition()  
np.argpartition()

## SET OPERATIONS

np.unique()  
np.union1d()  
np.intersect1d()  
np.setdiff1d()  
np.setxor1d()

np.in1d()  
np.isin()

## LOGICAL OPS

np.logical\_and()  
np.logical\_or()  
np.logical\_not()  
np.logical\_xor()  
np.all()  
np.any()

## COMPARISON OPS

arr == x  
arr != x  
arr > x  
arr < x  
arr >= x  
arr <= x  
np.equal()  
np.not\_equal()  
np.greater()  
np.less()  
np.greater\_equal()  
np.less\_equal()

## MATRIX CREATION SHORTCUTS

np.tri()  
np.tril()  
np.triu()  
np.vander()  
np.fromiter()  
np.tile()  
np.repeat()

## I/O OPERATIONS

np.load()  
np.save()  
np.savez()  
np.savetxt()  
np.loadtxt()

#### BITWISE (rare but complete)

np.bitwise\_and()  
np.bitwise\_or()  
np.bitwise\_xor()  
np.invert()  
np.left\_shift()  
np.right\_shift()

#### SPECIAL FUNCTIONS (SciPy-like, NumPy subset)

np.gcd()  
np.lcm()

#### NUMPY PERFORMANCE

np.vectorize()  
np.frompyfunc()  
numpy broadcasting  
ufunc.reduce()  
ufunc.accumulate()  
ufunc.outer()

#### MASKING

np.ma.masked\_array()  
np.ma.masked\_where()  
np.ma.filled()

#### ADVANCED (ML-SIDE USAGE)

np.stack for batch tensors  
np.expand\_dims for channel dims  
np.tile for dataset augmentation



np.random.normal for weight init  
np.linalg.svd / eig for PCA  
np.mean(axis=0) for feature averaging  
np.where() for label mapping  
np.clip() for gradient clipping