

NumPy Cheat Sheet

Creating Arrays

```
np.array([1,2,3])      -> From list  
np.zeros((2,3))        -> 2x3 array of 0s  
np.ones((2,2))         -> 2x2 array of 1s  
np.eye(3)              -> Identity matrix 3x3  
np.arange(0, 10, 2)    -> [0,2,4,6,8]  
np.linspace(0,1,5)     -> 5 evenly spaced values from 0 to 1  
np.random.rand(2,2)    -> Random floats 0-1  
np.random.randint(1,10,(2,2)) -> Random ints
```

Array Attributes

```
arr.shape   -> Shape (rows, cols)  
arr.ndim    -> Number of dimensions  
arr.size    -> Total number of elements  
arr.dtype   -> Data type of elements  
arr.itemsize -> Byte size of one element
```

Indexing & Slicing

```
arr[2]        -> Third element  
arr[1:3]      -> Slice  
arr[0,1]      -> 2D: Row 0, Col 1  
arr[arr > 2]  -> Boolean filter
```

Reshaping

```
arr.reshape((2,3)) -> Change shape  
arr.flatten()      -> Convert to 1D  
arr.T or arr.transpose() -> Transpose matrix
```

Math Operations

```
arr + 2, arr * 2  -> Element-wise math  
np.sum(arr), np.mean(arr) -> Aggregates  
np.max(arr), np.min(arr)  
np.std(arr), np.var(arr)
```

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Linear Algebra

```
np.dot(A, B)      -> Matrix multiplication  
np.linalg.inv(A) -> Inverse of matrix  
np.linalg.det(A) -> Determinant  
np.linalg.eig(A) -> Eigenvalues/vectors
```

Miscellaneous

```
np.unique(arr)    -> Unique values  
np.sort(arr)     -> Sorted array  
np.concatenate([a,b]) -> Join arrays  
np.split(arr, 2)  -> Split array in 2
```