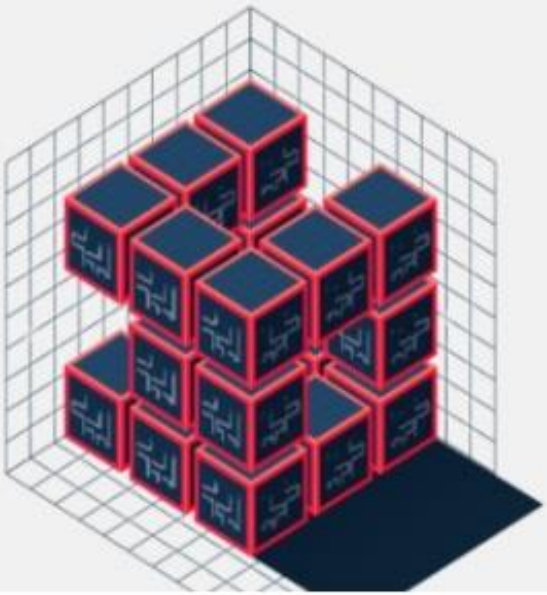
Complete **NumPy** *Cheat Sheet*



Complete NumPy Cheat Sheet

1/4

Array Creation and Manipulation

1. **Creating Arrays**
   - **np.arange(start, stop, step)** - Create an array with a range of values.
   - **np.linspace(start, stop, num)** - Create an array with evenly spaced values.
   - **np.zeros((2, 3))** - Create an array of zeros.
   - **np.ones((2, 3))** - Create an array of ones.
   - **np.eye(3)** - Create a 3x3 identity matrix.
2. **Reshaping and Transposing**
   - **arr.reshape(new_shape)** - Reshape an array.
   - **arr.flatten()** - Flatten an array to 1D.
   - **arr.T** - Transpose of an array.
3. **Concatenation and Splitting**
   - **np.concatenate((arr1, arr2), axis)** - Concatenate arrays along a specified axis.
   - **np.vstack((arr1, arr2))**, **np.hstack((arr1, arr2))** - Stack arrays vertically or horizontally.
   - **np.split(arr, indices_or_sections, axis)** - Split an array into multiple sub-arrays.

Complete NumPy Cheat Sheet

2/4

Mathematical Functions

1. **Trigonometric Functions**
   - **np.sin(arr), np.cos(arr), np.tan(arr)** - Trigonometric functions.
   - **np.arcsin(arr), np.arccos(arr), np.arctan(arr)** - Inverse trigonometric functions.
2. **Exponential and Logarithmic Functions**
   - **np.exp(arr)** - Exponential function.
   - **np.log(arr), np.log10(arr), np.log2(arr)** - Logarithmic functions.
3. **Hyperbolic Functions**
   - **np.sinh(arr), np.cosh(arr), np.tanh(arr)** - Hyperbolic functions.
4. **Rounding and Absolute Values**
   - **np.round(arr, decimals)** - Round elements to the specified number of decimals.
   - **np.floor(arr), np.ceil(arr)** - Floor and ceiling functions.
   - **np.abs(arr)** - Absolute values of elements.

Complete NumPy Cheat Sheet

3/4

Statistical Functions

1. **Aggregation Functions**
   - **np.sum(arr)**, **np.mean(arr)**, **np.median(arr)**, **np.std(arr)**, **np.var(arr)** - Statistical functions.
   - **arr.min()**, **arr.max()** - Minimum and maximum values.
   - **np.argmin(arr)**, **np.argmax(arr)** - Indices of minimum and maximum values.
2. **Interpolation**
   - **np.interp(x, xp, fp)** - 1-D linear interpolation.
   - **np.interp(x, xp, fp, left, right)** - Handles out-of-bounds values.

Linear Algebra

1. **Matrix Operations**
   - **np.dot(arr1, arr2)** - Dot product of two arrays.
   - **np.matmul(arr1, arr2)** - Matrix multiplication.
   - **np.linalg.inv(arr)** - Inverse of a matrix.
   - **np.linalg.det(arr)** - Determinant of a matrix.
2. **Eigenvalues and Eigenvectors**
   - **np.linalg.eig(arr)** - Eigenvalues and eigenvectors of a matrix.
   - **np.linalg.eigh(arr)** - Eigenvalues and eigenvectors of a Hermitian matrix.

Complete NumPy Cheat Sheet

4/4

Random Number Generation

1. **Random Sampling**
   - **np.random.rand(2, 3)** - Random samples from a uniform distribution.
   - **np.random.randn(2, 3)** - Random samples from a normal distribution.
   - **np.random.randint(low, high, size)** - Random integers.
2. **Random Permutations**
   - **np.random.permutation(arr)** - Randomly permute a sequence or array.

Advanced Functions

1. **Broadcasting**
   - Implicitly perform operations on arrays with different shapes.
2. **Vectorization**
   - Apply functions to arrays without explicit looping.
3. **Masking and Filtering**
   - **np.where(condition, x, y)** - Return elements chosen from x or y based on a condition.
   - **arr[arr > threshold]** - Filter elements based on a condition.