NumPy Functions Cheat Sheet

1. Creating Arrays

np.array() - Create an array from a Python list/tuple

np.zeros(shape) - Create array of zeros

np.ones(shape) - Create array of ones

np.full(shape, fill_value) - Create array with a constant value

np.eye(n) - Identity matrix

np.arange(start, stop, step) - Range array like range()

np.linspace(start, stop, num) - Evenly spaced values between start and stop

np.random.rand(dims) - Random values in [0, 1) (uniform distribution)

np.random.randn(dims) - Random values (normal distribution)

np.random.randint(low, high, size) - Random integers

2. Inspecting Arrays

arr.shape - Shape of array

arr.ndim - Number of dimensions

arr.size - Total elements

arr.dtype - Data type of elements

arr.itemsize - Size (in bytes) of each element

3. Reshaping & Flattening

arr.reshape(shape) - Reshape without changing data

arr.flatten() - Flatten to 1D

arr.ravel() - Flatten (returns view if possible)

np.resize(arr, shape) - Resize with repeated elements if needed

4. Indexing & Slicing

arr[index] - Access element

arr[start:stop:step] - Slice like lists

arr[1, 2] - Access row 1, col 2 in 2D

arr[:, i] - All rows, column i

arr[i, :] - Row i, all columns

arr[arr > 0] - Boolean indexing

5. Mathematical Operations

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np.add(x, y) / x + y - Element-wise addition

np.subtract(x, y) / x - y - Subtraction

np.multiply(x, y) / x * y - Multiplication

np.divide(x, y) / x / y - Division

np.power(x, y) - Element-wise power

np.sqrt(x) - Square root

np.exp(x) - Exponential

np.log(x) - Natural log

np.abs(x) - Absolute value

np.round(x) - Round values

6. Aggregation & Statistics

arr.sum() - Sum of all elements

arr.mean() - Mean

arr.std() - Standard deviation

arr.var() - Variance

arr.min() / arr.max() - Min/Max value

np.percentile(arr, q) - Percentile

np.median(arr) - Median

np.argmin() / np.argmax() - Index of min/max

7. Matrix Operations

np.dot(a, b) - Dot product

np.matmul(a, b) - Matrix multiplication

np.transpose(arr) / arr.T - Transpose

np.linalg.inv(arr) - Inverse of matrix

np.linalg.det(arr) - Determinant

np.linalg.eig(arr) - Eigenvalues & vectors

8. Sorting & Searching

np.sort(arr) - Returns sorted copy

arr.sort() - Sorts in-place

np.argsort(arr) - Indices of sorted array

np.where(condition) - Indices where condition is True

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np.searchsorted(arr, val) - Find indices to insert val

9. Set Operations

np.unique(arr) - Unique values

np.intersect1d(a, b) - Intersection

np.union1d(a, b) - Union

np.setdiff1d(a, b) - Elements in a but not in b

np.in1d(a, b) - Check if elements of a are in b

10. Copying Arrays

arr.copy() - Deep copy

arr.view() - Shallow copy (same data)