NumPy Functions Summary

1. Array Creation Functions

Function	Description
np.array()	Creates an array from a Python list or tuple
np.zeros()	Creates an array filled with zeros
np.ones()	Creates an array filled with ones
np.full()	Creates an array filled with a specified value
np.arange()	Creates evenly spaced values within a range
np.linspace()	Creates evenly spaced numbers over a range
np.eye()	Creates an identity matrix
np.random.rand()	Creates random array of given shape
np.random.randint()	Creates random integers

2. Array Inspection / Information

Function	Description
arr.shape	Returns array dimensions
arr.size	Total number of elements
arr.ndim	Number of dimensions
arr.dtype	Data type of elements
arr.itemsize	Bytes per element

3. Array Manipulation

Function	Description
np.reshape()	Changes shape without changing data
np.ravel()	Flattens array
np.transpose()	Transposes dimensions
np.concatenate()	Joins arrays
np.vstack() / np.hstack()	Stack vertically / horizontally
np.split()	Splits an array
np.expand_dims()	Adds new axis
np.squeeze()	Removes single-dimensional axes

4. Mathematical Functions

Function	Description
np.add(), np.subtract(), np.multiply(), np.divide()	Element-wise operations
np.power()	Element-wise power
np.sqrt()	Square root
np.exp()	Exponential
np.log(), np.log10()	Logarithms
np.sin(), np.cos(), np.tan()	Trigonometric functions
np.round(), np.floor(), np.ceil()	Rounding functions

5. Statistical Functions

Function	Description
np.mean()	Average of elements
np.median()	Median
np.std()	Standard deviation
np.var()	Variance
np.min(), np.max()	Minimum and maximum
np.sum()	Sum of all elements
np.cumsum()	Cumulative sum
np.percentile()	Percentile value

6. Logical / Comparison Functions

Function	Description
np.equal(), np.not_equal()	Element-wise comparison
np.greater(), np.less()	Greater or less comparison
np.logical_and(), np.logical_or(), np.logical_not()	Logical operations
np.all(), np.any()	Check if all/any elements meet condition

7. Sorting and Searching

Function	Description
np.sort()	Sorts array
np.argsort()	Returns indices that sort array
np.where()	Returns indices where condition is true
np.argmax(), np.argmin()	Index of max/min value
np.unique()	Returns unique elements

8. Linear Algebra

Function	Description
np.dot()	Dot product
np.matmul()	Matrix multiplication
np.linalg.inv()	Inverse of matrix
np.linalg.det()	Determinant
np.linalg.eig()	Eigenvalues & eigenvectors
np.linalg.norm()	Vector/matrix norm

9. Random Module (np.random)

Function	Description
np.random.rand()	Random floats [0,1)
np.random.randn()	Random normal distribution
np.random.randint()	Random integers
np.random.choice()	Randomly pick from list
np.random.shuffle()	Shuffle elements
np.random.seed()	Set seed for reproducibility

10. Input and Output

Function	Description
np.save()	Save array to binary file (.npy)
np.load()	Load array from file
np.savetxt()	Save array to text file
np.loadtxt()	Load array from text file