Function/Operation	Description	Example
Array Creation	Various functions to create NumPy arrays	`np.array([1, 2, 3])` `np.zeros((2, 3))` (creates a 2x3 array filled with zeros) `np.ones((3, 4))` (creates a 3x4 array filled with ones)
Reshaping	Change the shape of an array	`arr = np.arange(12).reshape(3, 4)` (reshapes a 1D array into a 3x4 2D array)
Data Type Casting	Convert data types of elements	`arr.astype(float)` (converts all elements in the array to float data type)
Indexing and Slicing	Access specific elements or sub-arrays	`arr[1, 2]` (accesses the element at row 1, column 2) `arr[1:]` (selects all elements from row 1 onwards)
Arithmetic Operations	Perform element-wise arithmetic operations	`arr1 + arr2` (adds corresponding elements of two arrays) `arr * 2` (multiplies each element of the array by 2)
Comparison Operations	Compare elements and return boolean arrays	`arr > 5` (returns True for elements greater than 5)
Logical Operations	Perform logical operations on boolean arrays	`arr1 & arr2` (element-wise AND operation on two boolean arrays)
Statistical Functions	Calculate statistics of the array	`np.mean(arr)` (calculates the mean of all elements) `np.std(arr)` (calculates the standard deviation)
Linear Algebra Functions (if NumPy has linear algebra module installed)	Perform matrix operations	`np.dot(arr1, arr2)` (matrix multiplication of two arrays)
Random Number Generation	Generate random numbers	`np.random.rand(2, 2)` (creates a 2x2 array of random floats between 0 and 1)
Sorting	Sort elements of the array	`np.sort(arr)` (sorts the array in ascending order)
Searching	Find elements within the array	`np.where(arr > 10)` (returns indices of elements greater than 10)
Array Splitting	Divide an array into multiple sub-arrays	`np.split(arr, 3)` (splits the array into three sub-arrays)
Concatenating Arrays	Join multiple arrays together	`np.concatenate((arr1, arr2))` (concatenates two arrays along the first axis) -

		`np.vstack((arr1, arr2))` (stacks arrays vertically) `np.hstack((arr1, arr2))` (stacks arrays horizontally)
Universal Functions (ufuncs)	Apply mathematical functions element-wise	`np.sqrt(arr)` (calculates the square root of each element) `np.sin(arr)` (calculates the sine of each element)
Inversion	Invert the elements of the array (reciprocal)	`np.reciprocal(arr)` (calculates the reciprocal of each element)
Maximum/Minimum	Find the minimum or maximum value(s)	- `np.max(arr)` (returns the maximum value in the array) `np.min(arr)` (returns the minimum value in the array) `np.argmax(arr)` (returns the index of the first maximum value) `np.argmin(arr)` (returns the index of the first minimum value)
Zeros/Ones	Create arrays filled with zeros or ones	As mentioned previously: `np.zeros((2, 3))`,`np.ones((3, 4))`
Eye	Create an identity matrix	`np.eye(4)` (creates a 4x4 identity matrix)
Diagonal	Get or set the diagonal elements of an array	`np.diag(arr)` (extracts the diagonal elements as a 1D array) `np.diag([1, 2, 3])` (creates a diagonal matrix with specified elements)