**NumPy Statistical and String Functions**

**1. Statistical Functions**

NumPy provides various statistical functions to perform mathematical and statistical computations on arrays.

**Basic Statistical Functions**

| **Function** | **Description** |
| --- | --- |
| np.mean(arr) | Returns the mean (average) of array elements. |
| np.median(arr) | Returns the median of array elements. |
| np.std(arr) | Returns the standard deviation. |
| np.var(arr) | Returns the variance. |
| np.min(arr) | Returns the minimum value in the array. |
| np.max(arr) | Returns the maximum value in the array. |
| np.sum(arr) | Returns the sum of all elements in the array. |
| np.prod(arr) | Returns the product of all elements. |
| np.percentile(arr, q) | Returns the q-th percentile of the array. |
| np.quantile(arr, q) | Returns the q-th quantile value of the array. |
| np.corrcoef(arr1, arr2) | Returns the correlation coefficient between two arrays. |
| np.cov(arr1, arr2) | Computes the covariance matrix of two arrays. |

**2. String Functions**

NumPy provides vectorized string operations via numpy.char module.

**Basic String Functions**

| **Function** | **Description** |
| --- | --- |
| np.char.add(str1, str2) | Concatenates two strings element-wise. |
| np.char.multiply(str, n) | Repeats the string n times. |
| np.char.upper(str) | Converts string to uppercase. |
| np.char.lower(str) | Converts string to lowercase. |
| np.char.capitalize(str) | Capitalizes the first letter of the string. |
| np.char.title(str) | Capitalizes the first letter of each word. |
| np.char.strip(str, chars) | Removes leading/trailing characters. |
| np.char.split(str, sep) | Splits string based on a separator. |
| np.char.replace(str, old, new) | Replaces occurrences of old with new. |
| np.char.count(str, sub) | Counts occurrences of a substring. |

NumPy's statistical and string functions make data analysis and processing more efficient by enabling fast computations on large datasets. These functions are widely used in data science, machine learning, and data engineering tasks.