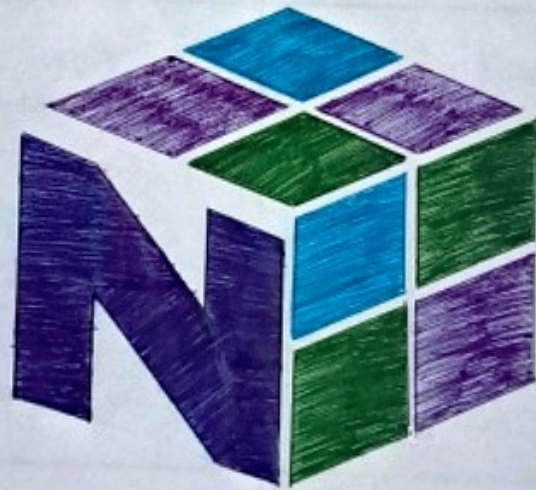# Important NumPy Methods For Data Scientists

NumPy is a Python library used for working with arrays. It also has functions for working in domain of linear algebra, fourier transform, and matrices. NumPy was created in 2005 by Travis Oliphant. It is an open source project and you can use it freely. NumPy stands for Numerical Python.
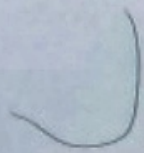
# NumPy Array Creation Methods

| Method | Description |
|---|---|
| np.array (< list >) | NumPy array from Python list |
| np.array (< list-of-lists >) | NumPy array from list of lists |
| np.array (< Pandas-series >) | NumPy array from PD Series |
| df.values | NumPy array from DataFrame |
| np.Zeros (< size >) | NumPy array from all zeros |
| np.ones (< size >) | NumPy array from all ones |
| np.eye (< size >) | Identity NumPy array |
| np.arange (< start >, < stop >, < step >) | Equally spaced NumPy array with specific step |
| np.linspace (< start >, < stop >, < count >) | Equally spaced NumPy array with specific size |
| np.random.randint (< low >, < high >, < size >) | NumPy array of random ints |
| np.random.random (< size >) | NumPy array of random floats |

# Mathematical Operations

| Method | Description |
|---|---|
| np.sin (<np-array>) | Trigonometric |
| np.cos (<np-array>) | Functions |
| np.tan (<np-array>) | |
| np.floor (<np-array>) | Element-wise floor value |
| np.ceil (<np-array>) | Element-wise ceiling value |
| np.rint (<np-array>) | Round to nearest int |
| np.round_ (<np-array>, <decimal-places>) | Round to decimal places |
| np.exp (<np-array>) | Element-wise exponent |
| np.log (<np-array>) | Element-wise logarithm |
| np.sqrt (<np-array>) | Element-wise square root |
| np.sum (<np-array>, <axis>) | Sum along an axis |
| np.mean(<np-array>, <axis>) | mean along an axis |
| np.std (<np-array>, <axis>) | Std. dev along on axis |

# NumPy Array Manipulation Methods

| Method | Description |
| --- | --- |
| array.reshape(&lt;new-shape&gt;) | Reshape NumPy Array |
| array.transpose() OR array.T | Transpose NumPy Array |
| np.concatenate (&lt;np-arrays&gt;, &lt;axis&gt;) | Concatenate NumPy Array |
| np.flatten(&lt;Nd-np-array&gt;) | Flatten a NumPy Array |
| np.unique (&lt;np-array&gt;, &lt;axis&gt;) | Find unique elements |
| array.tolist() | NumPy Array to List |

## Matrix and Vector Operations

| Method | Description |
| --- | --- |
| np.dot (&lt;np-array1&gt;, np-array2&gt;) | Dot Product |
| np.matmul(&lt;np-array1, np-array2&gt;) np-array1 @ np-array 2 | Matrix Multiplication |
| np.linalg.norm (&lt;np-array&gt;) | Vector |

# Search Methods

| Method | Description |
|---|---|
| np.argmax(<np-array>,<axis>) | Max Element Index |
| np.argmin(<np-array>,<axis>) | Min Element Index |
| np.where(<condition>,<true-return-value>,<false-return-value>) | Conditional search and Replacement |
| np.nonzero(<np-array>) | Index of non-zero elements |

# Sorting Methods

| Method | Description |
|---|---|
| np.sort(<np-array>,<axis>) | Sort Array |
| np.argsort(<np-array>,<axis>) | Return the order of indices that sort the array |