The NumPy library is the core library for scientific computing in Python. It provides a high-performance multidimensional array object, and tools for working with these arrays.

### NumPy Basics

**1D array**

```python
>>> a = np.array([1,2,3])
```

**2D array**

```python
>>> b = np.array([[1,2,3],[4,5,6]])
```

**3D array**

```python
>>> c = np.array([[[1,2,3],[4,5,6]],[[7,8,9],[10,11,12]]])
```

**Create an empty array**

```python
>>> np.empty((2,2))
```

**Create an array of zeros**

```python
>>> np.zeros((2,2))
```

**Create an array of ones**

```python
>>> np.ones((2,2))
```

**Create a 2X2 identity matrix**

```python
>>> np.eye(2)
```

**Create an array of spaced values**

```python
>>> np.linspace(1,10,10)
```

**Create a constant array**

```python
>>> np.full((2,2),1)
```

**Create a view of the array with the same data**

```python
>>> h = a.view()
```

**Create a deep copy of the array**

```python
>>> h = a.copy()
```

**Create stacked column-wise arrays**

```python
>>> np.c_[a,d]
```

**Stack arrays vertically (row-wise)**

```python
>>> np.vstack((a,d))
```

**Stack arrays horizontally (column-wise)**

```python
>>> np.hstack((a,d))
```

**Concatenate arrays**

```python
>>> np.concatenate((a,d),axis=0)
```

**Reshape, but don't change data**

```python
>>> g.reshape(3,-2)
```

**Sort the elements of an array's axis**

```python
>>> a.sort()  # Sort an array
>>> b.sort(axis=1)  # Sort items at rows 0 and 1 in column 1
>>> c.sort(axis=0)  # Sort the elements of an array's axis
```

**Sort an array**

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**Create an array of evenly spaced values (number of samples)**

```python
>>> np.linspace(1,10,10)
```

**Create an array of eveny spaced values (step value)**

```python
>>> np.arange(0,10,2)
```

**Create a 2D identity matrix**

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```

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