Basic `NumPy` functions

Basic `numpy` functions for computational linear algebra will be discussed here.

1D Array (Vector)

In NumPy, a one-dimensional (1D) array is similar to a list or vector in mathematics. It consists of a single row or column of numbers, making it an ideal structure for storing sequences of values.

```python
import numpy as np

# Creating a 1D array
arr = np.array([1, 2, 3, 4])
print(arr)
```

```
[1 2 3 4]
```

2D Array (Matrix)

A two-dimensional (2D) array is equivalent to a matrix in mathematics. It consists of rows and columns and is often used to store tabular data or perform matrix operations.

```python
from IPython.display import display, HTML
# Creating a 2D array (Matrix)
matrix = np.array([[1, 2, 3], [4, 5, 6]])
print(matrix)
```

```
[[1 2 3]
 [4 5 6]]
```

Zero Arrays

Zero arrays are used to initialize matrices or arrays with all elements set to zero. This can be useful when creating placeholder arrays where the values will be computed or updated later.

```python
# Creating an array of zeros
zero_matrix = np.zeros((3, 3))
print(zero_matrix)
```

```
[[0. 0. 0.]
 [0. 0. 0.]
 [0. 0. 0.]]
```

Task: Create a 10×10 empty matrix.

```python
EM=np.zeros((10,10))
print(EM)
```

```
[[0. 0. 0. 0. 0. 0. 0. 0. 0. 0.]
 [0. 0. 0. 0. 0. 0. 0. 0. 0. 0.]
 [0. 0. 0. 0. 0. 0. 0. 0. 0. 0.]
 [0. 0. 0. 0. 0. 0. 0. 0. 0. 0.]
 [0. 0. 0. 0. 0. 0. 0. 0. 0. 0.]
 [0. 0. 0. 0. 0. 0. 0. 0. 0. 0.]
 [0. 0. 0. 0. 0. 0. 0. 0. 0. 0.]
 [0. 0. 0. 0. 0. 0. 0. 0. 0. 0.]
 [0. 0. 0. 0. 0. 0. 0. 0. 0. 0.]
 [0. 0. 0. 0. 0. 0. 0. 0. 0. 0.]]
```

```python
print(EM+5)
```

```
[[5. 5. 5. 5. 5. 5. 5. 5. 5. 5.]
 [5. 5. 5. 5. 5. 5. 5. 5. 5. 5.]
 [5. 5. 5. 5. 5. 5. 5. 5. 5. 5.]
 [5. 5. 5. 5. 5. 5. 5. 5. 5. 5.]
 [5. 5. 5. 5. 5. 5. 5. 5. 5. 5.]
 [5. 5. 5. 5. 5. 5. 5. 5. 5. 5.]
 [5. 5. 5. 5. 5. 5. 5. 5. 5. 5.]
 [5. 5. 5. 5. 5. 5. 5. 5. 5. 5.]
 [5. 5. 5. 5. 5. 5. 5. 5. 5. 5.]
 [5. 5. 5. 5. 5. 5. 5. 5. 5. 5.]]
```