Task 10

Exercise 1: Create a simple NumPy array.

In [ ]:
```
import numpy as np

npArray=np.array([1,2,3,4,5,6,7,8,9,10])
npArray
```

Out[ ]:
```
array([ 1,  2,  3,  4,  5,  6,  7,  8,  9, 10])
```

Exercise 2: Create a multi-dimensional NumPy array using lists.

In [ ]:
```
data=[[1,2,3,4,5], [6,7,8,9,10]]
npArray=np.array(data)
npArray
```

Out[ ]:
```
array([[ 1,  2,  3,  4,  5],
       [ 6,  7,  8,  9, 10]])
```

Exercise 3a: Create a one-dimensional array containing element '0'.

In [ ]:
```
zeroArray=np.zeros(10)
zeroArray
```

Out[ ]:
```
array([0., 0., 0., 0., 0., 0., 0., 0., 0., 0.])
```

Exercise 3b: Create a multi-dimensional array containing element '0'.

In [ ]:
```
zeroArray=np.zeros((2,3))
zeroArray
```

Out[ ]:
```
array([[0., 0., 0.],
       [0., 0., 0.]])
```

Exercise 4: Create two arrays with different data types.

In [ ]:
```
npArray1=np.array([1,2,3,4,5], dtype=np.float64)
npArray2=np.array([1,2,3,4,5], dtype=np.int32)
print(npArray1.dtype)
print(npArray2.dtype)
```

```
float64
int32
```

Exercise 5: Arithmetic with NumPy Arrays.

Exercise 5a: Add two arrays.

In [ ]:
```
array=np.array([[1,2,3,4,5],[6,7,8,9,10]])
array+array
```

Out[ ]:
```
array([[ 2,  4,  6,  8, 10],
       [12, 14, 16, 18, 20]])
```

Exercise 5b: Subtract two arrays.

In [ ]:
```
array-array
```

Out[ ]:
```
array([[0, 0, 0, 0, 0],
       [0, 0, 0, 0, 0]])
```

Exercise 5c: Multiply two arrays.

In [ ]:
```
array*array
```

Out[ ]:
```
array([[  1,   4,   9,  16,  25],
       [ 36,  49,  64,  81, 100]])
```

Exercise 5d: Divide two arrays.

In [ ]:
```
array/array
```

Out[ ]:
```
array([[1., 1., 1., 1., 1.],
       [1., 1., 1., 1., 1.]])
```

Exercise 5e: Scalars and NumPy Arrays.

In [ ]:
```
1/array
```

Out[ ]:
```
array([[1.        , 0.5       , 0.33333333, 0.25      , 0.2       ],
       [0.16666667, 0.14285714, 0.125     , 0.11111111, 0.1       ]])
```

In [ ]:
```
array**2
```

Out[ ]:
```
array([[  1,   4,   9,  16,  25],
       [ 36,  49,  64,  81, 100]])
```

Exercise 5f: Comparison of NumPy Arrays.

In [ ]:
```
array2=np.array([[5,4,3,2,1],[10, 9, 8, 7, 6]])

array>array2
```

Out[ ]:
```
array([[False, False, False,  True,  True],
       [False, False, False,  True,  True]])
```