**NumPy exercises**

## **Array creation**

### Create a numpy array of size 10, filled with zeros

### Create a numpy array with values ranging from 10 to 49 and set its datatype to float

(*Hint*: *Remember that you can set a specific dtype while defining an array for e.g.*

*Arr1 =np.array([1,2,3,4,5]) #defines an int array by default*

*Arr2 =np.array([1,2,3,4,5], dtype = float) #specifying the dtype as an argument will create a float array*).

### Create a numpy matrix of 2\*2 integers, filled with ones.

### Create a numpy matrix of 3\*2 float numbers, filled with ones.

### Given the X numpy array, create a new numpy array with the same shape and type as X, filled with ones. (*#hint: search the function np.ones\_like( )* )

### Given the X numpy matrix, create a new numpy matrix with the same shape and type as X, filled with zeros. (*hint: similar function as above exists for zeros as well*)

### Create a numpy matrix of 4\*4 integers, filled with fives.

### Given the X numpy matrix, create a new numpy matrix with the same shape and type as X, filled with sevens.

### Create a 3\*3 identity numpy matrix with ones on the diagonal and zeros elsewhere.

### Create a numpy array, filled with 3 random integer values between 1 and 10.

### Create a 3\*3\*3 numpy matrix, filled with random float values.

### Create a numpy array with numbers from 1 to 10

### Create a numpy array with the odd numbers between 1 to 10

### Create a numpy array with numbers from 1 to 10, in descending order.

### Create a 3\*3 numpy matrix, filled with values ranging from 0 to 8

## **Array indexing:**

### Given the X numpy array, show its first element

X = np.array(['A','B','C','D','E'])

### Given the X numpy array, show its last element

X = np.array(['A','B','C','D','E'])

### Given the X numpy array, show its first three elements

X = np.array(['A','B','C','D','E'])

### Given the X numpy array, show all middle elements

X = np.array(['A','B','C','D','E'])

### Given the X numpy array, show the elements in reverse position.

X = np.array(['A','B','C','D','E'])

### Given the X numpy array, show the elements in an odd position.

X = np.array(['A','B','C','D','E'])

### Given the X numpy matrix, show the first row’s elements.

X = np.array([

[1, 2, 3, 4],

[5, 6, 7, 8],

[9, 10, 11, 12],

[13, 14, 15, 16]

])

### Given the X numpy matrix, show the last row elements.

X = np.array([

[1, 2, 3, 4],

[5, 6, 7, 8],

[9, 10, 11, 12],

[13, 14, 15, 16]

])

### Given the X numpy matrix, show the first element on first row

X = np.array([

[1, 2, 3, 4],

[5, 6, 7, 8],

[9, 10, 11, 12],

[13, 14, 15, 16]

])

### Given the X numpy matrix, show the last element on last row.

X = np.array([

[1, 2, 3, 4],

[5, 6, 7, 8],

[9, 10, 11, 12],

[13, 14, 15, 16]

])

### Given the X numpy matrix, show the first two elements on the first two rows.

X = np.array([

[1, 2, 3, 4],

[5, 6, 7, 8],

[9, 10, 11, 12],

[13, 14, 15, 16]

])

### Given the X numpy matrix, show the last two elements on the last two rows

X = np.array([

[1, 2, 3, 4],

[5, 6, 7, 8],

[9, 10, 11, 12],

[13, 14, 15, 16]

])

## **Array manipulation**

### Convert the given integer numpy array to float (*you need to google the function that will help you do this*)

X = [-5, -3, 0, 10, 40]

### Reverse the given numpy array (first element becomes last) through indexing

X = [-5, -3, 0, 10, 40]

### Given the X numpy array, set the fifth element equal to 1

X = np.zeros(10)

### Given the X numpy matrix, change the last row with all 1

X = np.array([

[1, 2, 3, 4],

[5, 6, 7, 8],

[9, 10, 11, 12],

[13, 14, 15, 16]

])

### Given the X numpy matrix, add 5 to every element

X = np.array([

[1, 2, 3, 4],

[5, 6, 7, 8],

[9, 10, 11, 12],

[13, 14, 15, 16]

])