

Numpy Assignment'

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```
[2]: import numpy as np
list_ = [ '1' , '2' , '3' , '4' , '5' ]
array_list = np.array(object = list_)
```

0.0.1 Q1. Is there any difference in the data type of variables `list_` and `array_list`? If there is then write a code to print the data types of both the variables.

0.0.2 ANS:

- Yes, there is a difference between the data types of `list_` and `array_list`. `list_` is a list object, whereas `array_list` is a numpy array object.

```
[3]: import numpy as np

list_ = [ '1' , '2' , '3' , '4' , '5' ]
array_list = np.array(object = list_)

print(f"The data type of list_ is {type(list_)}")
print(f"The data type of array_list is {type(array_list)}")
```

The data type of `list_` is <class 'list'>

The data type of `array_list` is <class 'numpy.ndarray'>

```
[ ]:
```

0.0.3 Q2. Write a code to print the data type of each and every element of both the variables `list_` and `array_list`.

```
[4]: import numpy as np

list_ = [ '1' , '2' , '3' , '4' , '5' ]
array_list = np.array(object = list_)

print("Data type of each element in list_:")
for element in list_:
    print(f" {element}: {type(element)}")

print("Data type of each element in array_list:")
```

```
for element in array_list:
    print(f" {element}: {type(element)}")
```

Data type of each element in list_:

```
1: <class 'str'>
2: <class 'str'>
3: <class 'str'>
4: <class 'str'>
5: <class 'str'>
```

Data type of each element in array_list:

```
1: <class 'numpy.str_'>
2: <class 'numpy.str_'>
3: <class 'numpy.str_'>
4: <class 'numpy.str_'>
5: <class 'numpy.str_'>
```

```
[ ]:
```

0.0.4 Q3. Considering the following changes in the variable, array_list:

```
[ ]: array_list = np.array(object = list_, dtype = int)
```

0.0.5 Will there be any difference in the data type of the elements present in both the variables, list_ and arra_list? If so then print the data types of each and every element present in both the variables, list_ and arra_list. Consider the below code to answer further questions:

```
[5]: import numpy as np
num_list = [ [ 1 , 2 , 3 ] , [ 4 , 5 , 6 ] ]
num_array = np.array(object = num_list)
```

```
[6]: num_list
```

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

```
[7]: num_array
```

```
[7]: array([[1, 2, 3],
           [4, 5, 6]])
```

```
[8]: print("Data type of each element in list_:")
for element in list_:
    print(f" {element}: {type(element)}")

print("Data type of each element in array_list:")
for element in array_list:
```

```
print(f" {element}: {type(element)}")
```

Data type of each element in list_:

```
1: <class 'str'>
2: <class 'str'>
3: <class 'str'>
4: <class 'str'>
5: <class 'str'>
```

Data type of each element in array_list:

```
1: <class 'numpy.str_'>
2: <class 'numpy.str_'>
3: <class 'numpy.str_'>
4: <class 'numpy.str_'>
5: <class 'numpy.str_'>
```

```
[ ]:
```

0.0.6 Q4. Write a code to find the following characteristics of variable, num_array:

- (i) shape
- (ii) size

```
[10]: num_array.shape
```

```
[10]: (2, 3)
```

```
[11]: num_array.size
```

```
[11]: 6
```

```
[ ]:
```

0.0.7 Q5. Write a code to create numpy array of 3*3 matrix containing zeros only, using a numpy array creation function.

[Hint: The size of the array will be 9 and the shape will be (3,3).]

```
[12]: import numpy as np
```

```
[17]: np.zeros((3,3))
```

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

```
[ ]:
```

0.0.8 Q6. Create an identity matrix of shape (5,5) using numpy functions?

[Hint: An identity matrix is a matrix containing 1 diagonally and other elements will be 0.]

```
[19]: np.eye(5,5)
```

```
[19]: array([[1., 0., 0., 0., 0.],  
           [0., 1., 0., 0., 0.],  
           [0., 0., 1., 0., 0.],  
           [0., 0., 0., 1., 0.],  
           [0., 0., 0., 0., 1.]])
```

```
[ ]:
```