assignment=22

July 28, 2023

Consider the below code to answer further questions:

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

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.

[7]:
```
type(list_)
```

[7]:
```
list
```

[8]:
```
type(array_list)
```

[8]:
```
numpy.ndarray
```

[9]:
```
array_list.dtype
```

[9]:
```
dtype('<U1')
```

2 Q2. Write a code to print the data type of each and every element of both the variables list_ and arra_list.

[10]:
```
for i in list_:
    print(type(i))
```

```
<class 'str'>
<class 'str'>
<class 'str'>
<class 'str'>
<class 'str'>
```

[11]:
```
for i in array_list:
    print(type(i))
```

```
<class 'numpy.str_'>
<class 'numpy.str_'>
<class 'numpy.str_'>
<class 'numpy.str_'>
<class 'numpy.str_'>
```

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

[12]:
```
array_list = np.array(object = list_, dtype = int)
```

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.

[13]:
```
for i in list_:
    print(type(i))
```

```
<class 'str'>
<class 'str'>
<class 'str'>
<class 'str'>
<class 'str'>
```

[14]:
```
for i in array_list:
    print(type(i))
```

```
<class 'numpy.int64'>
<class 'numpy.int64'>
<class 'numpy.int64'>
<class 'numpy.int64'>
<class 'numpy.int64'>
```

Consider the below code to answer further questions:

[15]:
```
import numpy as np
num_list = [ [ 1 , 2 , 3 ] , [ 4 , 5 , 6 ] ]
num_array = np.array(object = num_list)
```

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

(i) shape
(ii) size

[16]:
```
num_array.shape
```

[16]:
```
(2, 3)
```

[17]:
```
num_array.size
```

[17]:
```
6
```

5 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).]

[18]:
```
np.zeros((3,3))
```

[18]:
```
array([[0., 0., 0.],
       [0., 0., 0.],
       [0., 0., 0.]])
```

6 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)
```

[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.]])
```

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