26th Feb Assignment

March 11, 2023

1 Assignment 25

1.0.1 Consider the below code to answer further questions:

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

```python
[3]: array_list
```

```python
[3]: array(['1', '2', '3', '4', '5'], dtype='<U1')
```

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.

Ans.

```python
[4]: print(type(list_))
```

```
<class 'list'>
```

```python
[5]: print(type(array_list))
```

```
<class 'numpy.ndarray'>
```

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

Ans.

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

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

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

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

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

- 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 array_list? If so then print the data types of each and every element present in both the variables, list_ and arra_list.

Ans.

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

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

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

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

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

1.0.2   Consider the below code to answer further questions:

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

```
[13]:  num_array
```

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

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

- shape
- size

Ans.

```
[14]: #shape of num_array
      num_array.shape
```

```
[14]: (2, 3)
```

```
[15]: #size of num_array
      num_array.size
```

```
[15]: 6
```

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).]

Ans.

```
[20]: array=np.zeros(shape=(3,3),dtype=int)
```

```
[21]: array
```

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

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.]

Ans.

```
[27]: identity_matrix=np.eye(5,dtype=int)
```

```
[28]: identity_matrix
```

```
[28]: 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]])
```