Q1.

""" Yes, there is a difference in the data type of the list_ and array_list variables. list_ is a Python list, and array_list is a NumPy array, so their data types are different.

"""

In [2]:
```
import numpy as np
```

In [6]:
```
list = ['1','2','3','4']
arr_lst = np.array(list)
```

In [7]:
```
type(list)
```

Out[7]:
```
list
```

In [8]:
```
type(arr_lst)
```

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

Q2.

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

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

In [11]:
```
for j in arr_lst:
    print(type(j))
```

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

Q3.

Yes

In [12]:
```
list = ['1','2','3','4']
arr_lst = np.array(list,dtype = int)
```

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

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

In [14]:
```
for j in arr_lst:
    print(type(j))
```

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

Q4.

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

In [17]:
```
num_array.shape
```

Out[17]:
```
(2, 3)
```

In [18]:
```
num_array.size
```

Out[18]:
```
6
```

Q5.

In [20]:
```
np.zeros((3,3))
```

Out[20]:
```
array([[0., 0., 0.],
       [0., 0., 0.],
       [0., 0., 0.]])
```

Q6.

In [24]:
```
np.eye(5)
```

Out[24]:
```
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.]])
```