

UPES PYTHON LAB ASSIGNMENT

EXPERIMENT- 14

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BATCH- B8

Q1.

- Convert numbers =[1, 2.0, 3] to numpy array and convert all elements to string type.
- Create a 2 D array through list and set dtype as int32
- Find the rows and columns of the 2d array created in part b
- Print 10 random numbers between 1 and 100.

Sol:-

a)

```
import numpy as np
l1 = [1, 2, 3]
a = np.array(l1)
print ("List: ", l1)
print ("Array: ", a)
a=np.array([1,2,3],dtype=str)
print("string type of array is :",a)
```

Output:-

```
List:  [1, 2, 3]
Array:  [1 2 3]
string type of array is : ['1' '2' '3']
```

Part- b and c)

```
import numpy as np
a = np.array([(1,2,3),(4,5,6),(7,8,9)], dtype='int32')
print(a)
print("Number of rows and column are: ")
print(a.shape)
```

Output:-

```
[[1 2 3]
 [4 5 6]
 [7 8 9]]
Number of rows and column are:
(3, 3)
```

Part -d)

```
import numpy as np
x = np.random.randint(low=1, high=100, size=10)
print("random numbers b/w 1 and 100 :",x)
```

Output:

```
random numbers b/w 1 and 100 : [ 9 92 29 68 78 85 11 55  9 65]
```

Q2.

- a) Write a NumPy program to get help on the add function
- b) Write a NumPy program to test whether none of the elements of a given array is zero
- c) Write a NumPy program to test whether any of the elements of a given array is non-zero
- d) Write a NumPy program to generate an array of 15 random numbers from a standard normal distribution

Sol:-

Part- a)

```
import numpy as np
print(np.info(np.add))
```

Output:

```
add(x1, x2[, out])
Add arguments element-wise.

Parameters
-----
x1, x2 : array_like
    The arrays to be added.  If ``x1.shape != x2.shape``, they must be
    broadcastable to a common shape (which may be the shape of one or
    the other).

Returns
-----
add : ndarray or scalar
    The sum of `x1` and `x2`, element-wise.  Returns a scalar if
    both `x1` and `x2` are scalars.

Notes
-----
Equivalent to `x1` + `x2` in terms of array broadcasting.

Examples
-----
>>> np.add(1.0, 4.0)
5.0
>>> x1 = np.arange(9.0).reshape((3, 3))
>>> x2 = np.arange(3.0)
>>> np.add(x1, x2)
array([[ 0.,  2.,  4.],
       [ 3.,  5.,  7.],
       [ 6.,  8., 10.]])
None
```

Part –b and c)

```
import numpy as np
x = np.array([1, 2, 3, 4])
print("array:",x)
print("Test if none of the elements of the said array is zero:")
print(np.all(x))

import numpy as np
x = np.array([1, 0, 0, 0])
print("array:",x)
print("Test whether any of the elements of a given array is non-zero:")
print(np.any(x))
```

Output:

```
array: [1 2 3 4]
Test if none of the elements of the said array is zero:
True
array: [1 0 0 0]
Test whether any of the elements of a given array is non-zero:
True
```

Part d)

```
import numpy as np
random_num = np.random.normal(0,1,15)
print("15 random numbers from a standard normal distribution:")
print(random_num)
```

Output:

```
15 random numbers from a standard normal distribution:
[ 1.99058157  0.15417405 -0.39391025 -1.48489948  0.29855518 -1.35373947
  1.02102382  0.64103623  0.50760565 -0.13879922 -0.08017875 -1.69494824
  1.0248076   0.75403721  0.92778857]
```