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**SUBJECT CODE: IOT(2052)**

**SUBJECT: FOUNDATION OF DATA SCIENCE**

**ENROLL NO.: 0108IO211053**

**Q1. Write a Numpy program to get the Numpy version?**

**A1.**

```
In [16]: import numpy as np
         print(np.__version__)

1.21.5
```

```
In [ ]:
```

**Q2. Write a NumPy program to test whether none of the elements of a given array are zero?**

**A2.**

```
In [2]: import numpy as np
         x=np.array([1,2,3,4,])
         print ("array:")
         print(x)
         print("test if one of the elements of given array is zero:")
         print(np.all(x))
         import numpy as np
         x=np.array([0,1,2,3,4,])
         print ("array:")
         print(x)
         print("test if one of the elements of given array is zero:")
         print(np.all(x))

array:
[1 2 3 4]
test if one of the elements of given array is zero:
True
array:
[0 1 2 3 4]
test if one of the elements of given array is zero:
False
```

```
In [ ]:
```

Q3. Write a NumPy program to create an element-wise comparison (greater, greater\_equal, less and less\_equal) of two given arrays?

A3.

```
In [5]: import numpy as np
x=np.array([2,4])
y=np.array([1,6])
print ("numbers:")
print(x)
print(y)
print("comparision- greater")
print(np.greater(x,y))
print("comparision-greater_equal")
print(np.greater_equal(x,y))
print("comparision-less")
print(np.less(x,y))
print("comparision-less_equal")
print(np.less_equal(x,y))

numbers:
[2 4]
[1 6]
comparision- greater
[ True False]
comparision-greater_equal
[ True False]
comparision-less
[False  True]
comparision-less_equal
[False  True]
```

In [ ]:

Q4. Write a NumPy program to create an array with the values 1, 7, 13, 105 and determine the size of the memory occupied by the array?

A4.

```
In [7]: import numpy as np
x=np.array([1,7,13,105])
print("array:")
print(x)
print("size of the memory occupied by the array:")
print("%d bytes"%(x.size*x.itemsize))

array:
[ 1  7 13 105]
size of the memory occupied by the array:
16 bytes
```

In [ ]: +

Q5. Write a NumPy program to create an array of integers from 30 to 70?

A5.

```
In [10]: import numpy as np
array=np.arange(30,71)
print("array of the integers from 30 to 70")
print(array)

array of the integers from 30 to 70
[30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53
 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70]
```

In [ ]:

Q6. Write a NumPy program to create an array of all even integers from 30 to 70?

A6.

```
In [11]: import numpy as np
array=np.arange(30,71,2)
print("array of all even integers from 30 to 70")
print(array)

array of all even integers from 30 to 70
[30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62 64 66 68 70]
```

In [ ]:

Q7. Write a NumPy program to create a 3x3 identity matrix?

A7.

```
In [12]: import numpy as np
x=np.arange(2,11).reshape(3,3)
print(x)

[[ 2  3  4]
 [ 5  6  7]
 [ 8  9 10]]
```

In [ ]: