



**COGNIZANCE CLUB**

**PRELIMINARY**

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**Topic:** Task-3 (Python Programming)

## Task-3 (Python Programming)

1) Consider the vector [10, 11, 12, 13, 14], how to build a new vector with 5 consecutive zeros interleaved between each value?

### Code:

```
import numpy as np
a=int(input("First Number: "))
b=int(input("Last Number: "))
nums=np.arange(a,b+1)
new_nums=np.zeros(len(nums)+(len(nums)-1)*(5))
new_nums[::6]=nums
print(new_nums)
```

### Output:

```
First Number: 10
Last Number: 14
[10.  0.  0.  0.  0.  0. 11.  0.  0.  0.  0.  0. 12.  0.  0.  0.  0.  0.
 13.  0.  0.  0.  0.  0. 14.]
```

### Result:

Hence the program to add 5 consecutive Zeros in between the number is working successfully.

**2) Consider two random array A and B, check if they are equal**

**Code:**

```
import numpy as np
A=np.random.randint(0,2,6)
print("First array:")
print(A)
B=np.random.randint(0,2,6)
print("Second array:")
print(B)
array_equal=np.allclose(A, B)
print(array_equal)
```

**Output:**

```
First array:
[1 1 0 0 1 0]
Second array:
[0 0 0 1 1 0]
False
```

**Result:**

Hence the program to generate random two arrays and check for their equality is working successfully.

**3) What is the result of the following expression ?**

**Code:**

```
import numpy as np
print(0 * np.nan)
print(np.nan != np.nan)
print(np.inf > np.nan)
print(np.nan - np.nan)
print(0.3 == 3 * 0.1)
```

**Output:**

```
nan
True
False
nan
False
```

**Result:**

Hence the program to know the result of the following Commands is working successfully.

**4) Convert the first character of each element in a series to uppercase?**

**Code:**

```
import pandas as pd

ser=pd.Series(['amrita','school','of','engineering','chennai','campus'])

print("Before Changing")

print(list(ser))

newSeries=ser.map(lambda x: x[0].upper() + x[1:])

s=list(newSeries)

Str=' '.join([str(elem) for elem in s])

print("After changing")

print(Str)
```

**Output:**

```
Before Changing
['amrita', 'school', 'of', 'engineering', 'chennai', 'campus']
After changing
Amrita School Of Engineering Chennai Campus
```

**Result:**

Hence the program to convert the first character of each element in a series to uppercase is working successfully.

## 5) Do any two Exercises using Numpy

### 1) Addition of 2 numpy arrays

#### Code:

```
import numpy as np
arr1=np.array([2, -7, 5])
arr2=np.array([5, 8, -5])
print("1st Input array : ",arr1)
print("2nd Input array : ",arr2)
print("output added array : ",np.add(arr1,arr2))
```

#### Output:

```
1st Input array : [ 2 -7  5]
2nd Input array : [ 5  8 -5]
output added array : [7  1  0]
```

#### Result:

Hence the program to addition of two numpy arrays is working successfully.

### 3) Identity Matrix

#### Code:

```
import numpy as np
a=int(input("Enter the no.of rows/column : "))
mat=np.identity(a)
print("The Identity Matrix of",a,"rows and columns")
print(mat)
```

**Output:**

```
Enter the no.of rows/column : 6
The Identity Matrix of 6 rows and columns
[[1. 0. 0. 0. 0. 0.]
 [0. 1. 0. 0. 0. 0.]
 [0. 0. 1. 0. 0. 0.]
 [0. 0. 0. 1. 0. 0.]
 [0. 0. 0. 0. 1. 0.]
 [0. 0. 0. 0. 0. 1.]]
```

**Result:**

Hence the program to create an Identity Matrix is working successfully.