NAME : P.MOHITH PAVAN KUMAR

CLASS : CSE-B Group-B

ROLL NO : CH.EN.U4CSE20148

COGNIZANCE TASK 3

Amrita School of Engineering

Chennai

Question-1

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

Sample Input

```
First Number: 10
Last Number: 14
```

Sample Output

```
[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.]
```

CODE

```
import numpy as np
lst=input("enter the array numbers with gap : ").split()
nums = np.array(lst)
nums=[int(i) for i in nums]
print("Original array:")
print(nums)
new_nums = np.zeros(len(nums) + (len(nums)-1)*(5))
new_nums[::5+1] = nums
print("\nNew array:")
print(new_nums)
```

OUTPUT

```
enter the array numbers with gap : 10 11 12 13 14
Original array:
[10, 11, 12, 13, 14]

New array:
[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.]
```

Question-2

Consider two random array A anb B, check if they are equal

Sample Input

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

Sample Output

```
False
```

CODE

```
import numpy as np
lst1=input("enter the 1 st array : ").split()
x = np.array(lst1)
x=[int(i) for i in x]
lst2=input("enter the 2nd array  : ").split()
y = np.array(lst2)
y=[int(i) for i in y]
print("First array:")
print(x)
print("Second array:")
print(y)
print("Test above two arrays are equal or not!")
array_equal = True
if len(x) == len(y):
    for i in range(0,len(x)):
        if x[i]!=y[i]:
            array_equal =False
        else:
            pass
else:
    array_equal =False
print(array_equal)
```

OUTPUT

```
enter the 1 st array : 1 0 0 0 1 0
enter the 2nd array  : 0 0 1 1 0 1
First array:
[1, 0, 0, 0, 1, 0]
Second array:
[0, 0, 1, 1, 0, 1]
Test above two arrays are equal or not!
False
```

Question-3

What is the result of the following expression ?

```
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)
```

CODE

```
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
```

Question-4

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

Sample Input

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

Sample Output

```
Amrita School Of Engineering Chennai Campus
```

CODE

```
import pandas as pd
series = pd.Series(['amrita', 'school', 'of', 'engineering', 'chennai' , 'campus'])
newSeries = series.map(lambda x: x[0].upper() + x[1:])
print("\nResulting Series :")
string=""
for i in newSeries:
    string+=i+" "
print(string)
```

OUTPUT

```
Resulting Series :
Amrita School Of Engineering Chennai Campus
```

Question-5

Do any two Exercises using Numpy

1.addition of 2 numpy arrays

CODE

```
import numpy as np
x=np.array([[1,2,3],[4,5,6],[7,8,9]])
y=np.array([[1,4,9],[16,25,36],[49,64,81]])
print("x = \n",x,"\n","y = \n",y)
print("Addition of the arrays")
print("x+y =")
print(x+y)
```

OUTPUT:

```
x =
 [[1 2 3]
 [4 5 6]
 [7 8 9]]
 y =
 [[ 1  4  9]
 [16 25 36]
 [49 64 81]]
Addition of the arrays
x+y =
[[ 2  6 12]
 [20 30 42]
 [56 72 90]]
```

2.Multiplying a matrix

CODE

```
import numpy as np
x=np.array([[1,2,3],[4,5,6],[7,8,9]])
y=np.array([[1,4,9],[16,25,36],[49,64,81]])
print("x = \n",x,"\n","y = \n",y)
print("multiplication of the matrix")
print("x*y =")
#np.dot(x,y)
print(np.dot(x,y))
```

OUTPUT

```
x =
 [[1 2 3]
 [4 5 6]
 [7 8 9]]
 y =
 [[ 1  4  9]
 [16 25 36]
 [49 64 81]]
multiplication of the matrix
x*y =
[[ 180  246  324]
 [ 378  525  702]
 [ 576  804 1080]]
```

3.Identity Matrix

CODE

```
: np.identity(5)
```

OUTPUT:

```
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.]])
```

4.Array datatype conversion

CODE

```
import numpy as np
arr=np.array([[1,2,3],[4,5,6],[7,8,9]])
print("before : ",arr.dtype)
arr=arr.astype('float64')
print("After : ",arr.dtype)
```

OUTPUT :

```
import numpy as np
arr=np.array([[1,2,3],[4,5,6],[7,8,9]])
print("before : ",arr.dtype)
arr=arr.astype('float64')
print("After : ",arr.dtype)
```

```
before :  int32
After :  float64
```

5.Array re-dimensioning

CODE

OUTPUT :

```
import numpy as np
arr=np.array([1,2,3,4,5,6,7,8,9])
print(arr)
print("Before Redimensioning dimension is: ",arr.ndim)
arr2=arr.reshape(3,3)
print(arr2)
print("After Redimensioning dimension is  : ",arr2.ndim)
```

```
[1 2 3 4 5 6 7 8 9]
Before Redimensioning :  1
[[1 2 3]
 [4 5 6]
 [7 8 9]]
After Redimensioning :  2
```
