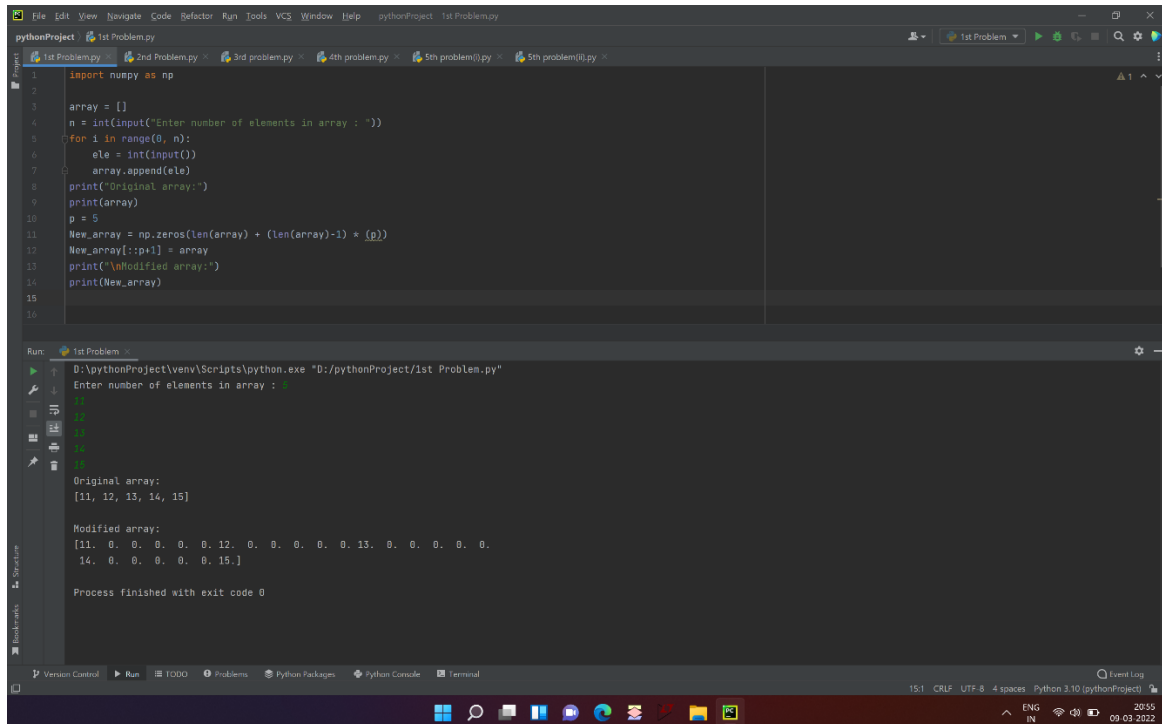


TASK-8

- 1) A program for building a new vector with 5 consecutive zeros interleaved between each value of the given vector:



```
1 import numpy as np
2
3 array = []
4 n = int(input("Enter number of elements in array : "))
5 for i in range(0, n):
6     ele = int(input())
7     array.append(ele)
8
9 print("Original array:")
10 print(array)
11
12 p = 5
13 New_array = np.zeros(len(array) + (len(array)-1) * (p))
14 New_array[::p+1] = array
15 print("\nModified array:")
16 print(New_array)
```

Run: 1st Problem

D:\pythonProject\venv\Scripts\python.exe "D:/pythonProject/1st Problem.py"

Enter number of elements in array : 4

Original array:

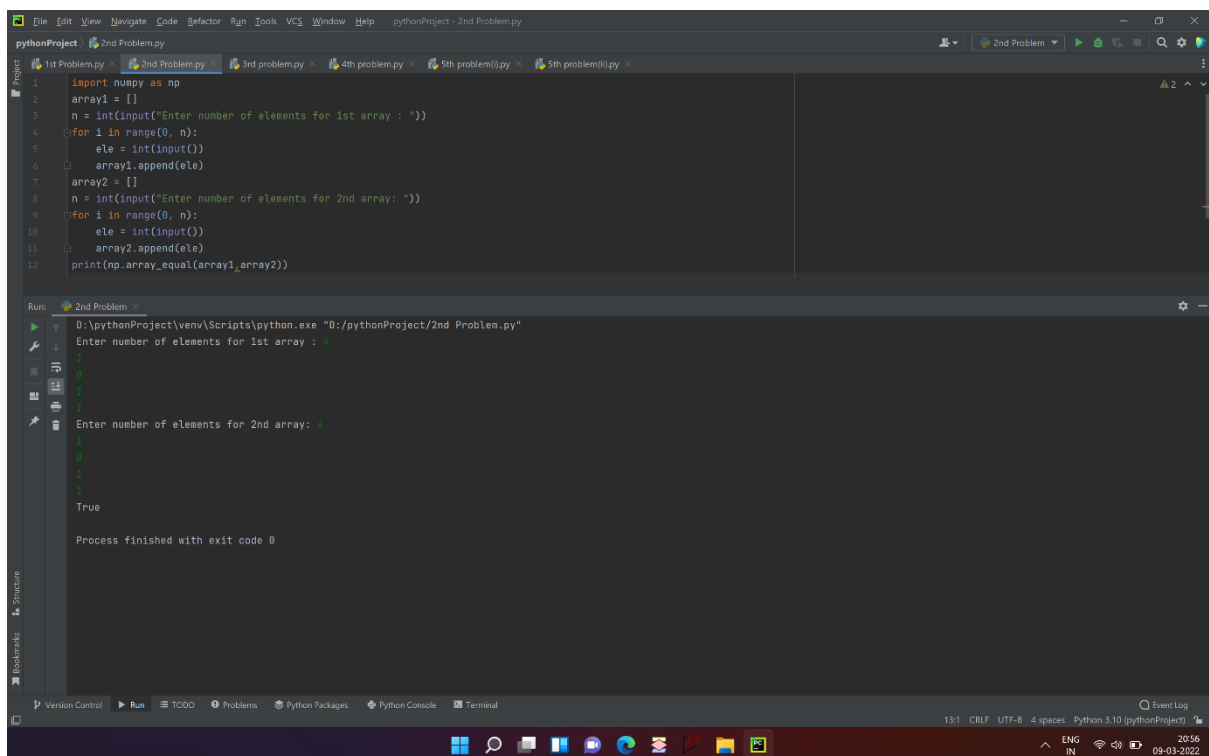
[11, 12, 13, 14, 15]

Modified array:

[11. 0. 0. 0. 0. 12. 0. 0. 0. 0. 13. 0. 0. 0. 0. 14. 0. 0. 0. 0. 15.]

Process finished with exit code 0

- 2) A program for checking two arrays are equal or not:



```
1 import numpy as np
2 array1 = []
3 n = int(input("Enter number of elements for 1st array : "))
4 for i in range(0, n):
5     ele = int(input())
6     array1.append(ele)
7
8 array2 = []
9 n = int(input("Enter number of elements for 2nd array : "))
10 for i in range(0, n):
11     ele = int(input())
12     array2.append(ele)
13
14 print(np.array_equal(array1,array2))
```

Run: 2nd Problem

D:\pythonProject\venv\Scripts\python.exe "D:/pythonProject/2nd Problem.py"

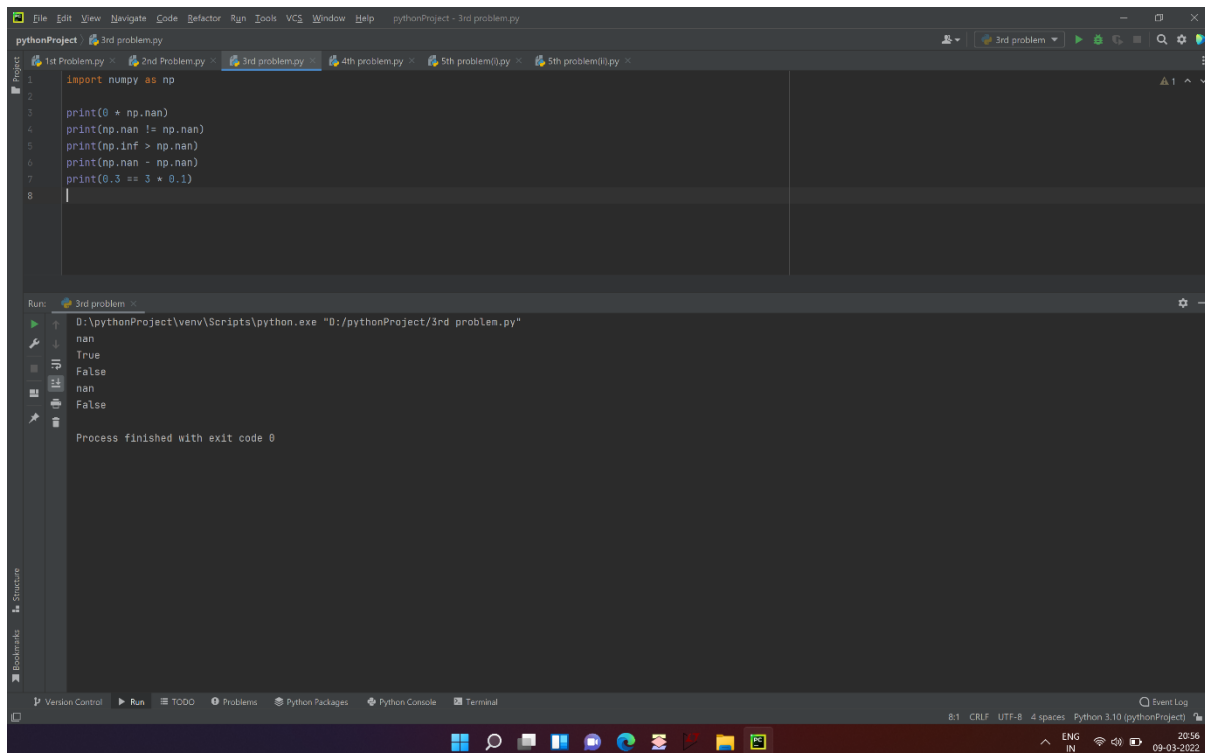
Enter number of elements for 1st array : 4

Enter number of elements for 2nd array : 4

True

Process finished with exit code 0

3) Output for the given expression:



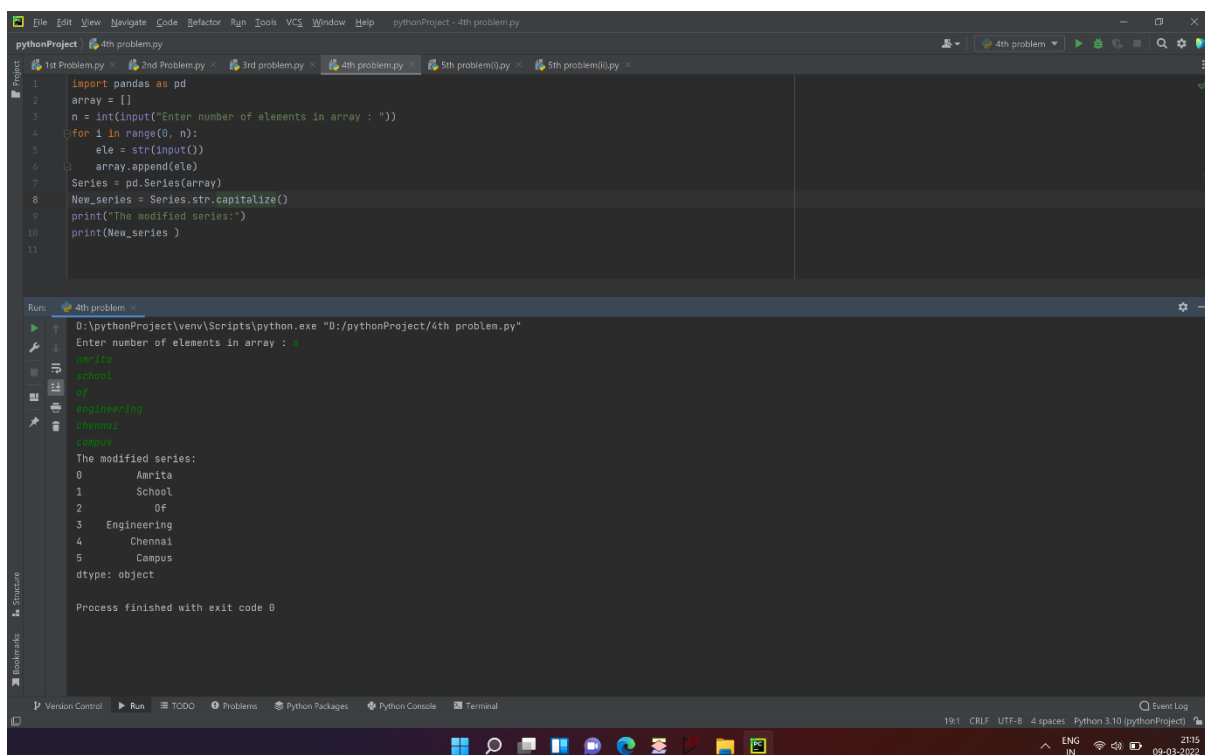
```
pythonProject 3rd problem.py
1 import numpy as np
2
3 print(0 + np.nan)
4 print(np.nan != np.nan)
5 print(np.inf > np.nan)
6 print(np.nan - np.nan)
7 print(0.3 == 3 * 0.1)
8
```

Run: 3rd problem

```
D:\pythonProject\venv\Scripts\python.exe "D:/pythonProject/3rd problem.py"
nan
True
False
nan
False

Process finished with exit code 0
```

4) A program for converting the first character of each element in a series to uppercase.



```
pythonProject 4th problem.py
1 import pandas as pd
2 array = []
3 n = int(input("Enter number of elements in array : "))
4 for i in range(0, n):
5     ele = str(input())
6     array.append(ele)
7 Series = pd.Series(array)
8 New_series = Series.str.capitalize()
9 print("The modified series:")
10 print(New_series)
11
```

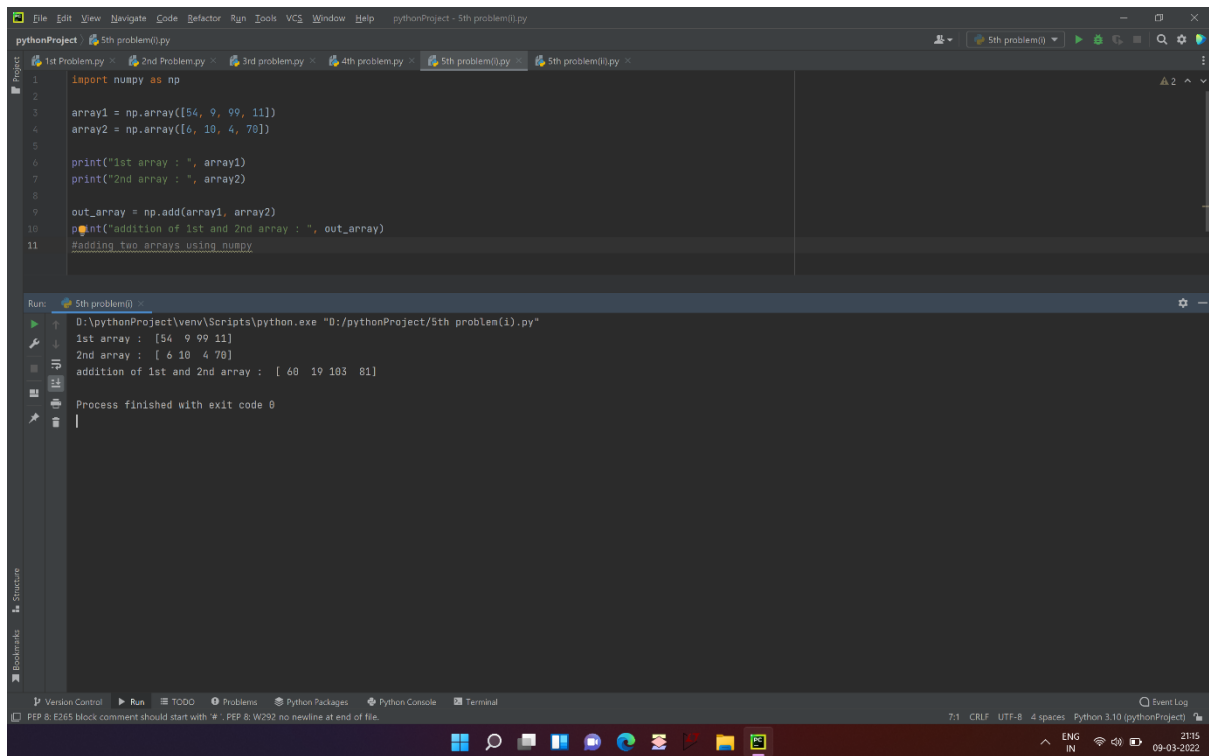
Run: 4th problem

```
D:\pythonProject\venv\Scripts\python.exe "D:/pythonProject/4th problem.py"
Enter number of elements in array : 6
Aarita
School
Of
Engineering
Chennai
Campus

The modified series:
0    Aarita
1    School
2        Of
3  Engineering
4    Chennai
5     Campus
dtype: object

Process finished with exit code 0
```

5) 1. Adding two NumPy arrays by Numpy:



The screenshot shows a Python script in VS Code that imports NumPy, creates two arrays, and adds them. The output in the Run console shows the arrays and their sum.

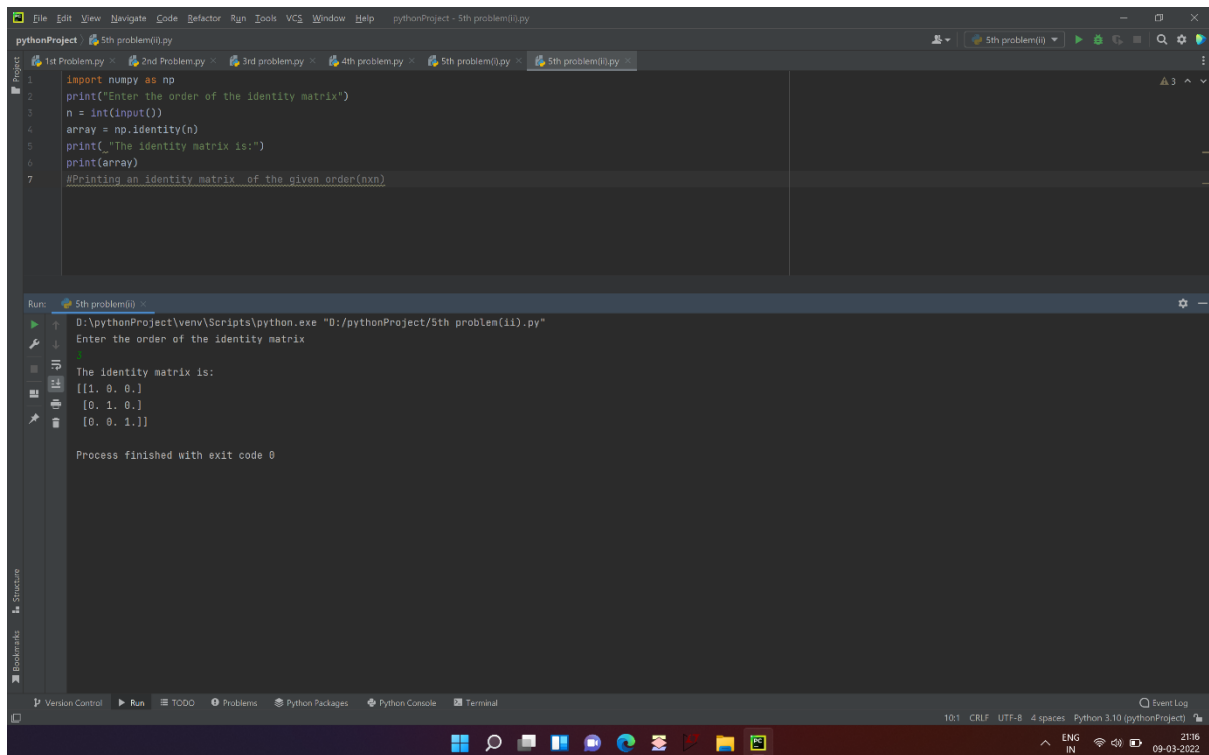
```
pythonProject 5th problem(i).py
1 import numpy as np
2
3 array1 = np.array([54, 9, 99, 11])
4 array2 = np.array([6, 10, 4, 70])
5
6 print("1st array : ", array1)
7 print("2nd array : ", array2)
8
9 out_array = np.add(array1, array2)
10 print("addition of 1st and 2nd array : ", out_array)
11 #adding two arrays using numpy
```

Run: 5th problem(i) x

```
D:\pythonProject\venv\Scripts\python.exe "D:/pythonProject/5th problem(i).py"
1st array : [54  9 99 11]
2nd array : [ 6 10  4 70]
addition of 1st and 2nd array : [ 60 19 103 81]

Process finished with exit code 0
```

5) 3. Identity Matrix



The screenshot shows a Python script in VS Code that prompts the user for the order of an identity matrix, creates it using NumPy, and prints it. The output in the Run console shows the input and the resulting identity matrix.

```
pythonProject 5th problem(ii).py
1 import numpy as np
2 print("Enter the order of the Identity matrix")
3 n = int(input())
4 array = np.identity(n)
5 print("The Identity matrix is:")
6 print(array)
7 #Printing an Identity matrix of the given order(nxn)
```

Run: 5th problem(ii) x

```
D:\pythonProject\venv\Scripts\python.exe "D:/pythonProject/5th problem(ii).py"
Enter the order of the Identity matrix
The Identity matrix is:
[[1.  0.  0.]
 [0.  1.  0.]
 [0.  0.  1.]]

Process finished with exit code 0
```