



ARTIFICIAL INTELLIGENCE(AI)

BSCYS-3rd Semester

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Lab Report # 5

Submitted To:Sir Mubashir Iqbal

Submitted By: M.Umer

Reg No: (24-CyS-024)

Department:Cyber Security (A)

BS CYBER SECURITY PROGRAM

DEPARTMENT OF COMPUTER SCIENCE HITEC UNIVERSITY TAXILA

Task 1:

Code:

The screenshot shows the Visual Studio Code interface. The top navigation bar has tabs for 'Welcome', 'task1.py' (which is the active tab), 'task 2.py', and 'import numpy as np Untitled-1'. The main editor area contains the following Python code:

```
1 import numpy as np
2
3 arr = np.array([[0, 1], [2, 3]])
4 print("Original array:\n", arr)
5 print("Maximum value:", arr.max())
6 print("Minimum value:", arr.min())
```

Below the editor, the terminal window displays the output of the code:

```
[[ 2  3  4]
 [ 5  6  7]
 [ 0  1  0]]
```

The bottom navigation bar includes tabs for 'PROBLEMS', 'OUTPUT', 'DEBUG CONSOLE', 'TERMINAL' (which is underlined in blue), and 'PORTS'. On the right side, there is a sidebar with a '+' icon and a list of available environments: 'Python' (selected), 'powershell', and another 'Python' entry.

Output:

The screenshot shows the VS Code interface with the terminal tab selected. The terminal window displays the following output:

```
[[ 2  3  4]
 [ 5  6  7]
 [ 8  9 10]]
PS C:\Users\FAIZAN COMPUTER>
```

The terminal also shows some blue square icons on the left side. The status bar at the bottom indicates the following information: Ln 6, Col 35, Spaces: 4, UTF-8, CRLF, {}, Python, 3.14.0, and a small icon.

Task2:

Code:

A screenshot of the Visual Studio Code interface. At the top, there are tabs for 'Welcome', 'task1.py', 'task 2.py' (which is currently active), and 'import numpy as np Untitled-1'. Below the tabs, the code editor shows the following Python script:

```
C: > Users > FAIZAN COMPUTER > task 2.py > ...
1 import numpy as np
2
3 matrix = np.arange(2, 11).reshape(3, 3)
4 print("3x3 matrix with values from 2 to 10:")
5 print(matrix)
```

The terminal tab is selected at the bottom, showing the output of the script:

```
[[ 2  3  4]
 [ 5  6  7]
 [ 8  9 10]]
PS C:\Users\FAIZAN COMPUTER>
```

On the right side, there is a sidebar with a '+' icon and three listed sessions: 'Python', 'powershell', and another 'Python' session.

Output:

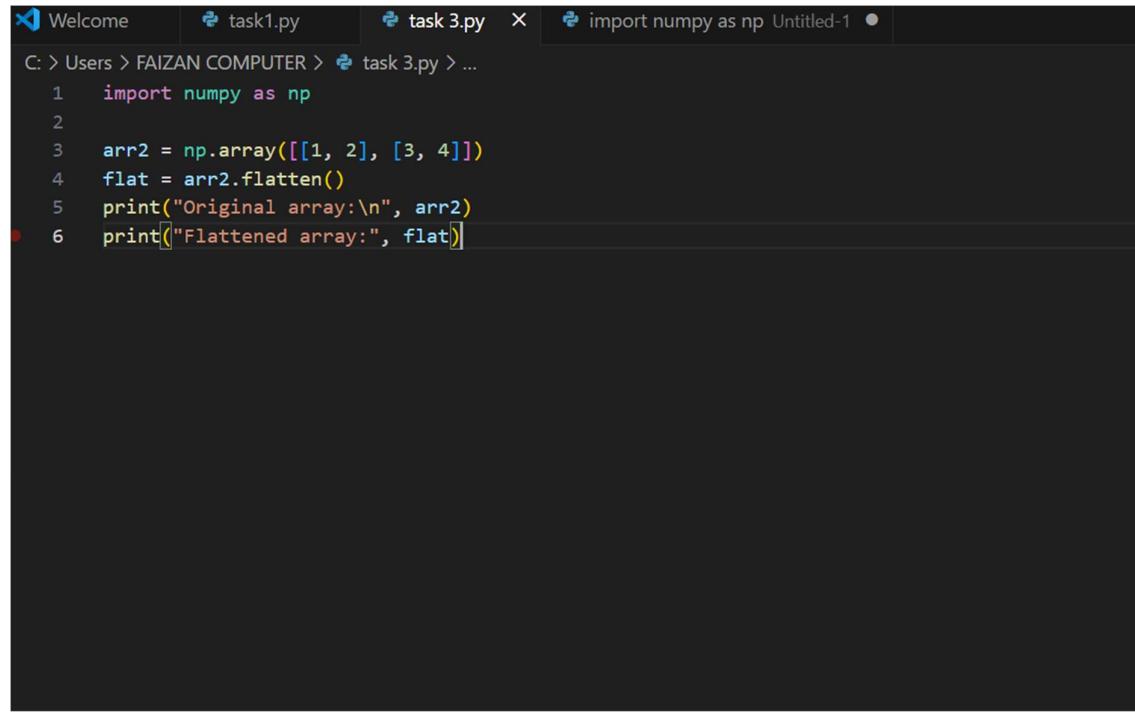
A screenshot of the Visual Studio Code interface, identical to the one above it. It shows the same code editor with the Python script and the same terminal output:

```
[[ 2  3  4]
 [ 5  6  7]
 [ 8  9 10]]
PS C:\Users\FAIZAN COMPUTER>
```

The sidebar on the right also shows the same three sessions: 'Python', 'powershell', and another 'Python' session.

Task 3:

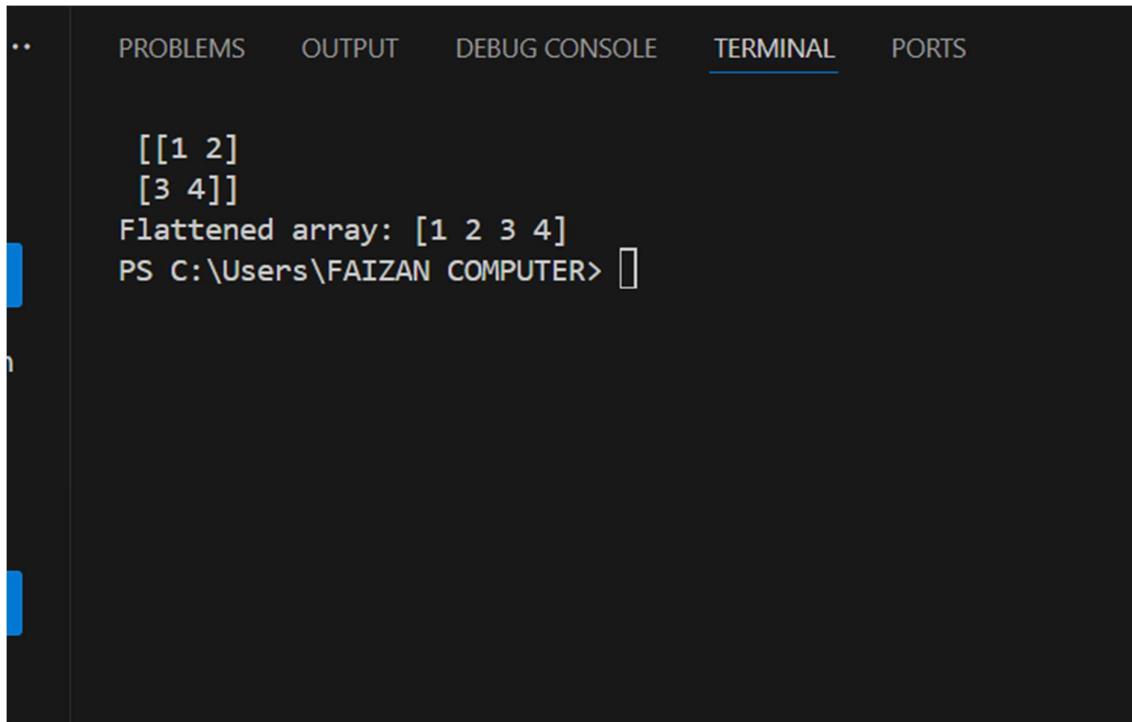
Code:



The screenshot shows a code editor window with four tabs at the top: "Welcome", "task1.py", "task 3.py", and "import numpy as np Untitled-1". The "task 3.py" tab is active. The code in the editor is as follows:

```
C: > Users > FAIZAN COMPUTER > task 3.py > ...
1 import numpy as np
2
3 arr2 = np.array([[1, 2], [3, 4]])
4 flat = arr2.flatten()
5 print("Original array:\n", arr2)
6 print("Flattened array:", flat)
```

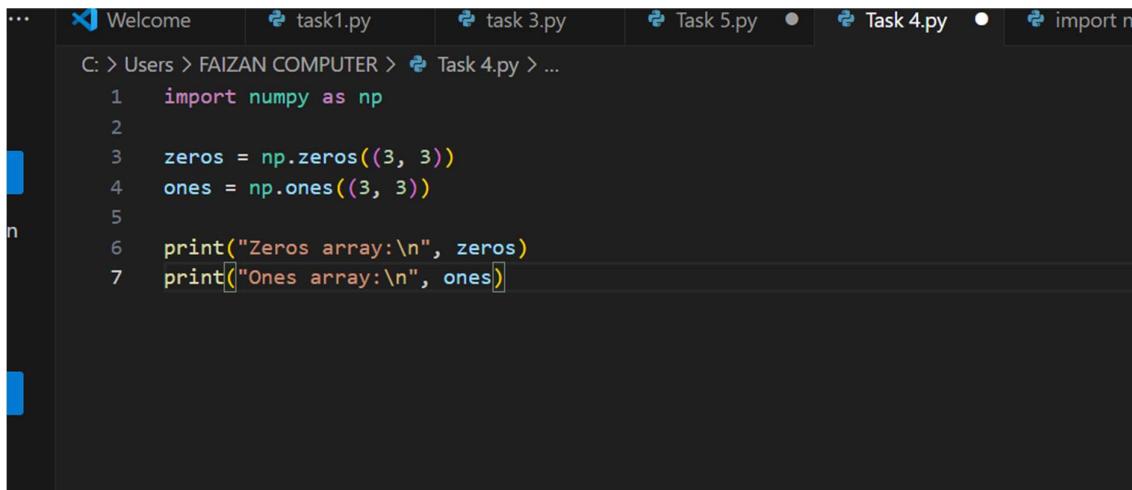
Output:



```
[[1 2]
 [3 4]]
Flattened array: [1 2 3 4]
PS C:\Users\FAIZAN COMPUTER> 
```

Task 4:

Code:



```
... Welcome task1.py task 3.py Task 5.py Task 4.py import n
C: > Users > FAIZAN COMPUTER > Task 4.py > ...
1 import numpy as np
2
3 zeros = np.zeros((3, 3))
4 ones = np.ones((3, 3))
5
6 print("Zeros array:\n", zeros)
7 print("Ones array:\n", ones)
```

Output:

The screenshot shows a terminal window with the following text output:

```
[[1. 1. 1.]
 [1. 1. 1.]
 [1. 1. 1.]]
PS C:\Users\FAIZAN COMPUTER> []
```

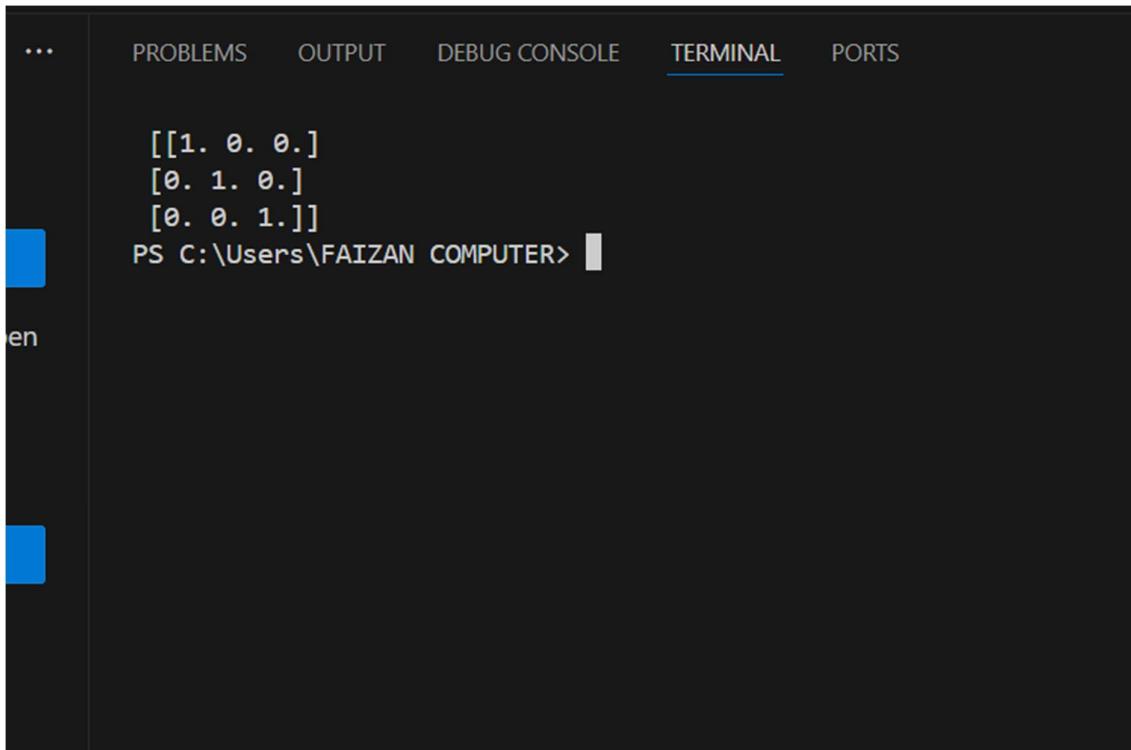
Task 5:

Code:

The screenshot shows a code editor with the following code in a file named task 5.py:

```
C: > Users > FAIZAN COMPUTER > task 5.py > ...
1 import numpy as np
2
3 identity = np.identity(3)
4 print("Identity matrix:\n", identity)
```

Output:



A screenshot of a terminal window from a code editor. The window has tabs at the top: PROBLEMS, OUTPUT, DEBUG CONSOLE, TERMINAL (which is underlined), and PORTS. The terminal content shows the creation of a 3x3 identity matrix:

```
[[1. 0. 0.]
 [0. 1. 0.]
 [0. 0. 1.]]
PS C:\Users\FAIZAN COMPUTER>
```

Conclusion:

In this lab, i learned to work with NumPy arrays and perform basic operations. In Task 1, i created a 2D array and found its maximum and minimum values. Task 2 tells that how to create a 3x3 matrix with consecutive values, while Task 3 showed how to flatten a 2D array into a 1D array. In Task 4, i created arrays of zeros and ones, which are useful for initialization in programming and in task 5 i learn how to create an identity matrix, which is important in linear algebra. Overall, these tasks helped me understand array creation, manipulation, and basic operations using Python and NumPy.