



ARTIFICIAL INTELLIGENCE(AI)

BSCYS-3rd Semester

Fall 2025

Lab Report # 5

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Reg No: **(24-CyS-024)**

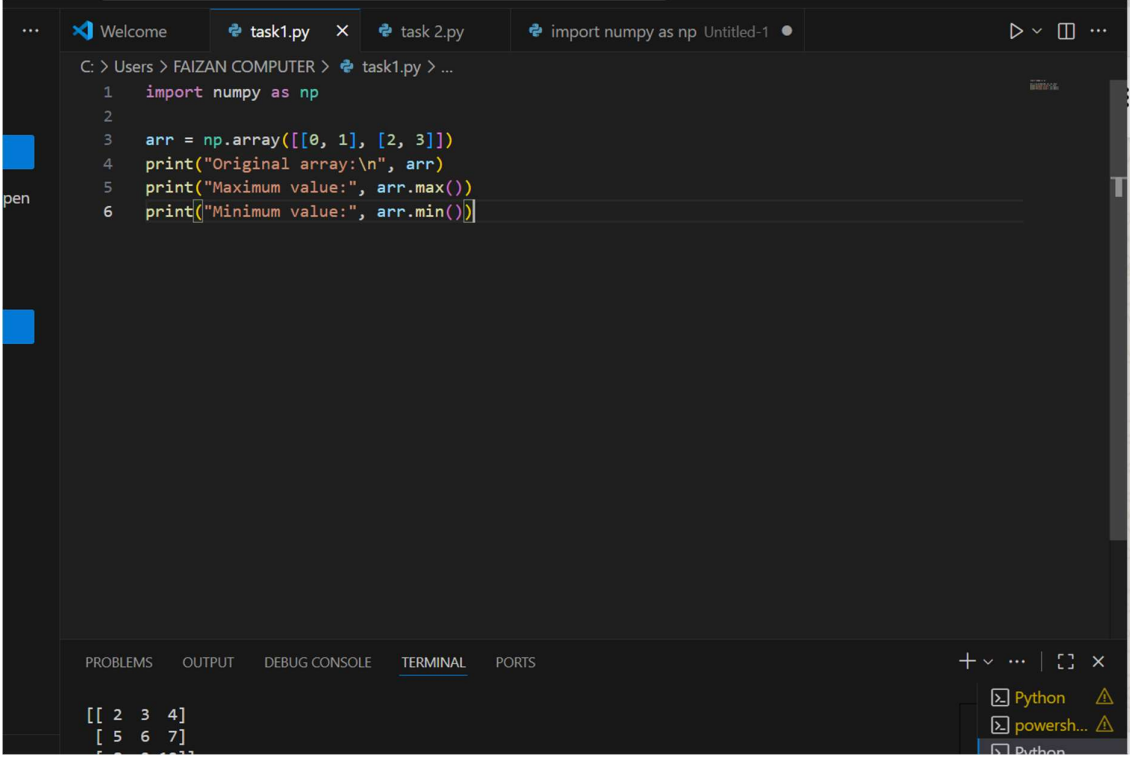
Department:**Cyber Security (A)**

BS CYBER SECURITY PROGRAM

DEPARTMENT OF COMPUTER SCIENCE HITEC UNIVERSITY TAXILA

Task 1:

Code:



The image shows a Visual Studio Code (VS Code) editor window with a dark theme. The editor has three tabs open: 'task1.py', 'task2.py', and 'import numpy as np Untitled-1'. The 'task1.py' tab is active, displaying the following Python code:

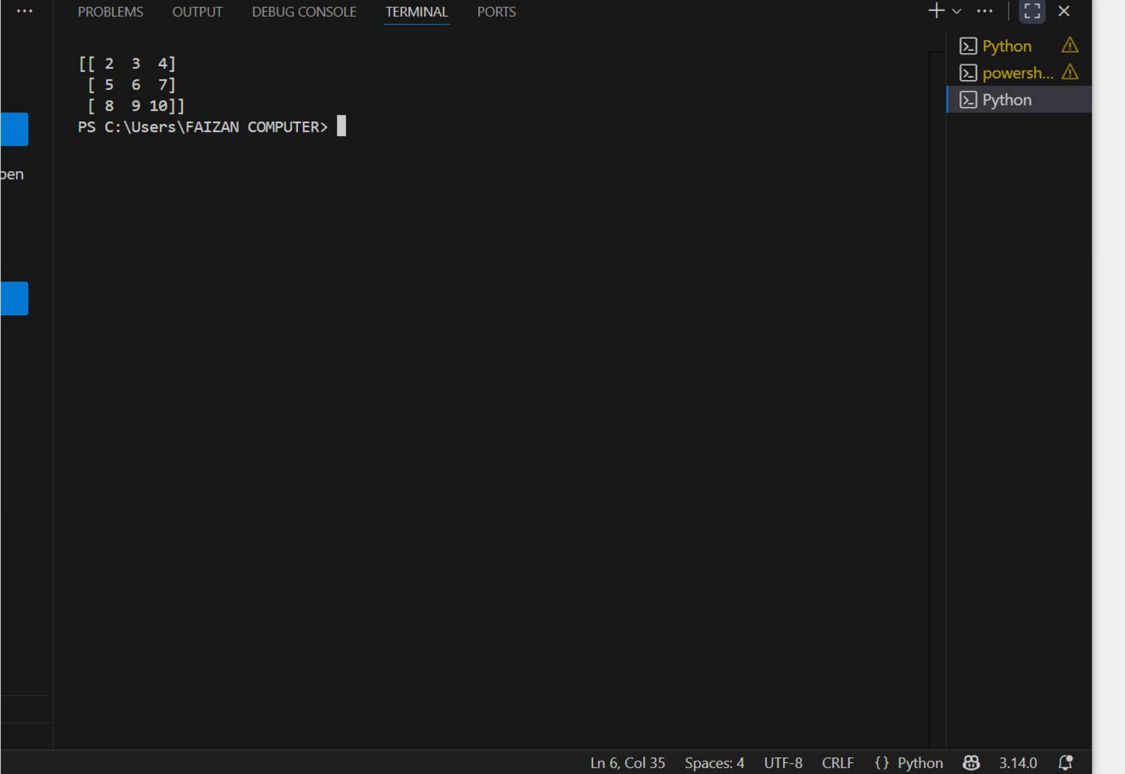
```
1 import numpy as np
2
3 arr = np.array([[0, 1], [2, 3]])
4 print("Original array:\n", arr)
5 print("Maximum value:", arr.max())
6 print("Minimum value:", arr.min())
```

Below the editor, the 'TERMINAL' panel is open, showing the output of the script:

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

The terminal output shows a 3x3 array, which is the result of the code execution. The array values are 2, 3, 4 in the first row, 5, 6, 7 in the second row, and 8, 9, 10 in the third row.

Output:



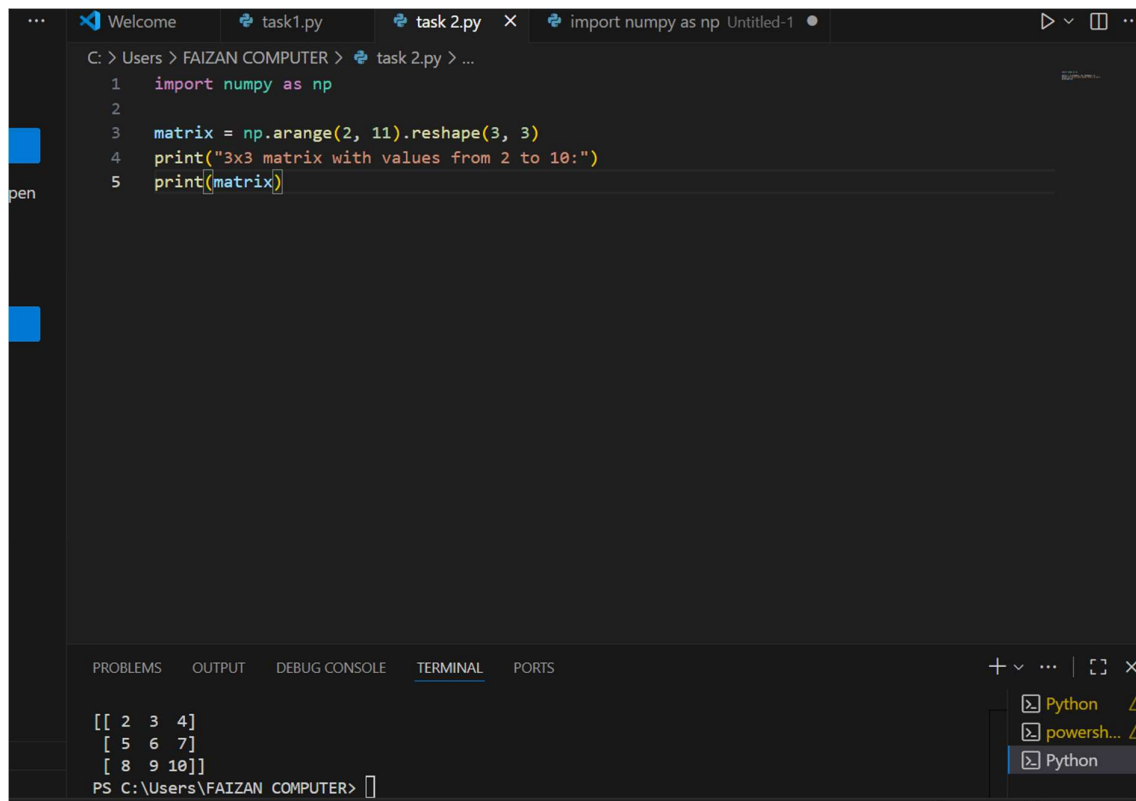
The image shows a screenshot of a Visual Studio Code (VS Code) terminal window. The terminal is open to the 'TERMINAL' tab, which is highlighted in the top bar. The terminal output displays a 3x3 matrix of numbers:

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

Below the matrix, the prompt 'PS C:\Users\FAIZAN COMPUTER>' is visible, followed by a cursor. The right sidebar shows a list of open files, including 'Python', 'powersh...', and another 'Python' file. The bottom status bar indicates the current line and column as 'Ln 6, Col 35', the number of spaces as 'Spaces: 4', the encoding as 'UTF-8', the line ending as 'CRLF', the language as 'Python', and the version as '3.14.0'.

Task2:

Code:

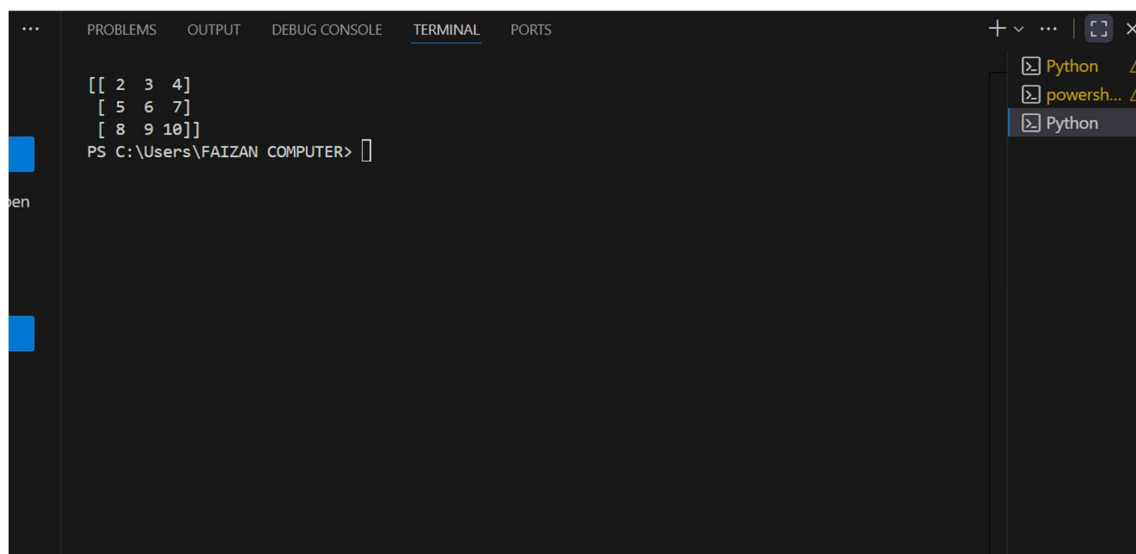


The screenshot shows a Visual Studio Code editor with three tabs: 'Welcome', 'task1.py', and 'task 2.py'. The 'task 2.py' tab is active, displaying a Python script. The script imports numpy as np, creates a 3x3 matrix using np.arange(2, 11).reshape(3, 3), and prints the matrix. The output of the script is displayed in the terminal at the bottom, showing the matrix values. The terminal also shows the command prompt 'PS C:\Users\FAIZAN COMPUTER>'.

```
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)
```

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

Output:

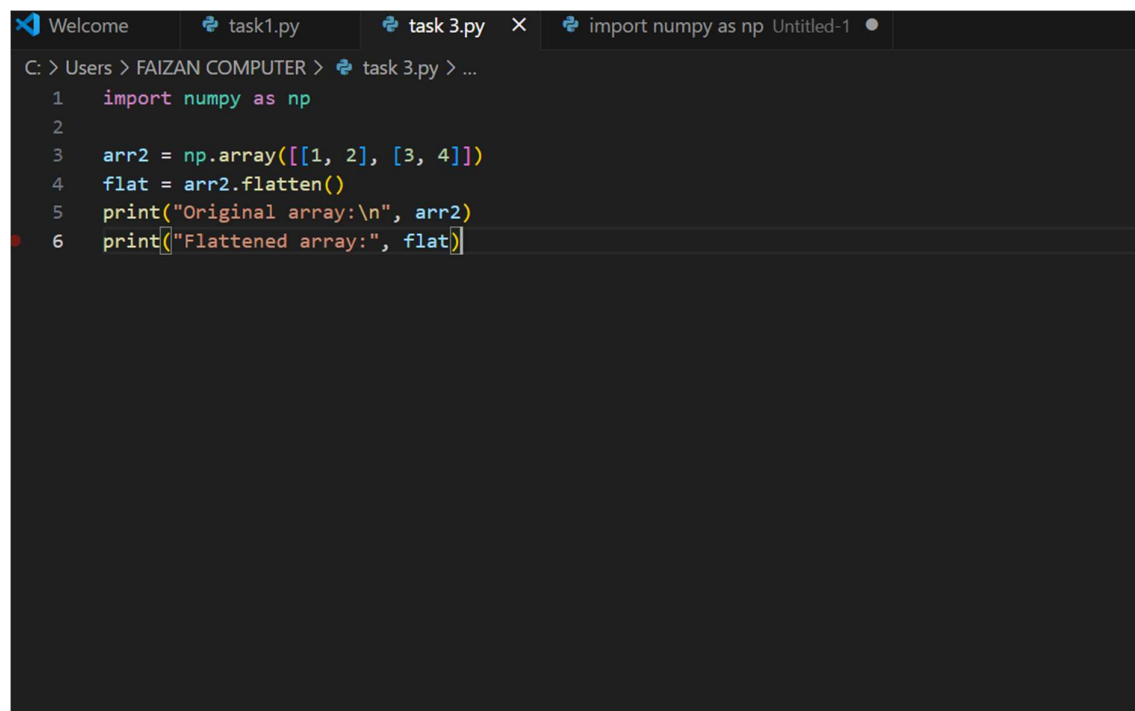


The screenshot shows the terminal output of the Python script. The output is a 3x3 matrix with values from 2 to 10. The terminal also shows the command prompt 'PS C:\Users\FAIZAN COMPUTER>'.

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

Task 3:

Code:

A screenshot of a code editor with a dark theme. The editor has four tabs at the top: 'Welcome', 'task1.py', 'task 3.py' (which is active), and 'import numpy as np Untitled-1'. Below the tabs, the file path 'C: > Users > FAIZAN COMPUTER > task 3.py > ...' is visible. The code is as follows:

```
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:

```
.. PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

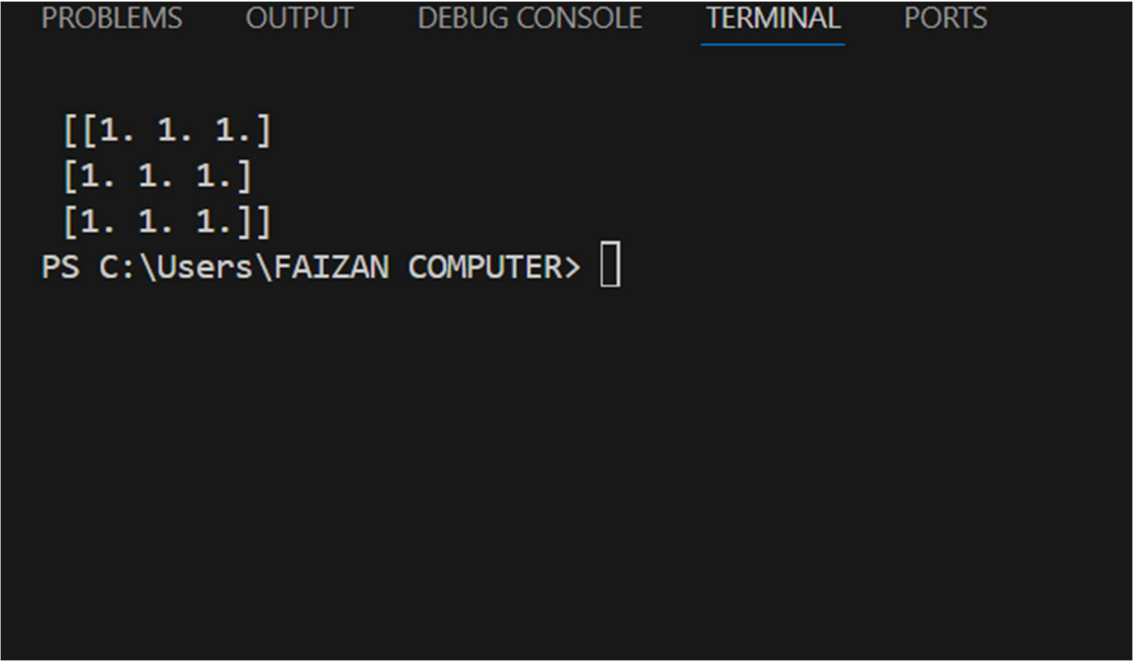
[[1 2]
 [3 4]]
Flattened array: [1 2 3 4]
PS C:\Users\FAIZAN COMPUTER> 
```

Task 4:

Code:

```
... Welcome task1.py task 3.py Task 5.py Task 4.py import nu
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:

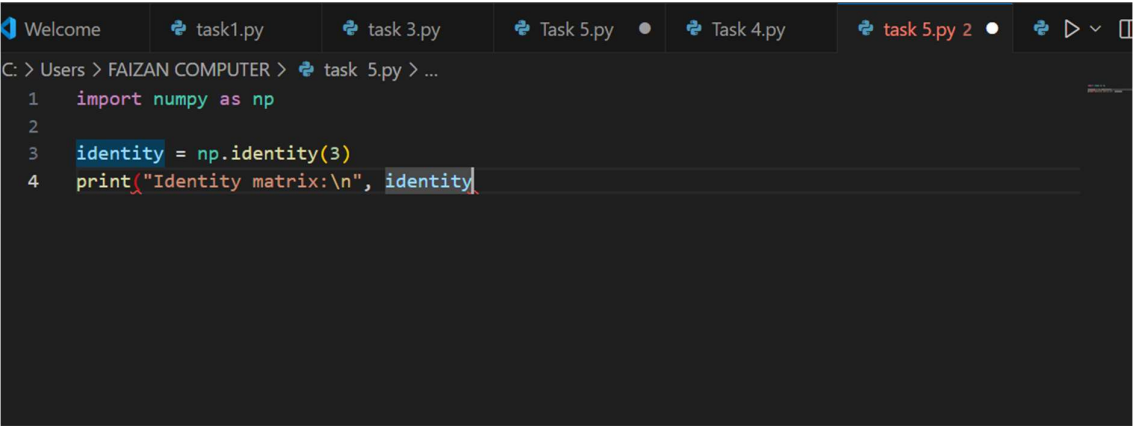


```
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

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

Task 5:

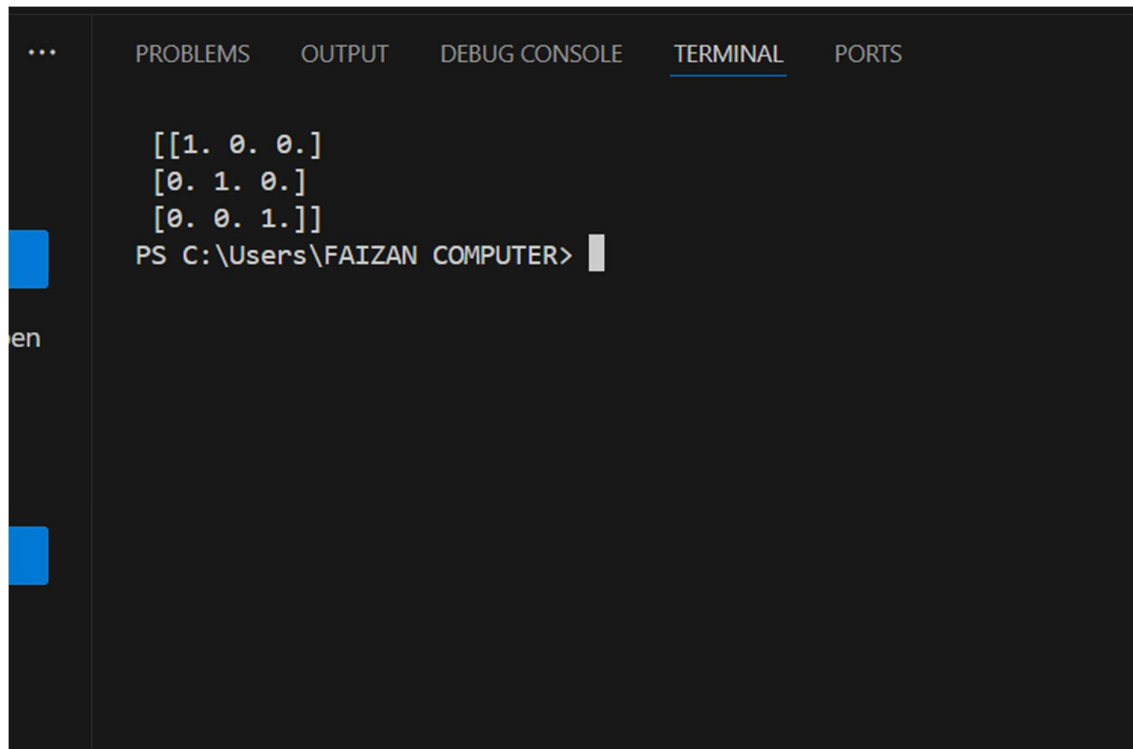
Code:



```
Welcome task1.py task 3.py Task 5.py Task 4.py task 5.py 2

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 with a dark background. At the top, there are tabs labeled 'PROBLEMS', 'OUTPUT', 'DEBUG CONSOLE', 'TERMINAL' (which is selected and underlined), and 'PORTS'. On the left side, there is a vertical sidebar with a blue square icon and the text 'en' below it. The terminal area displays a 3x3 identity matrix as a list of lists:

```
[[1. 0. 0.]  
 [0. 1. 0.]  
 [0. 0. 1.]]
```

 Below the matrix, the prompt 'PS C:\Users\FAIZAN COMPUTER>' is visible with a white cursor.

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.