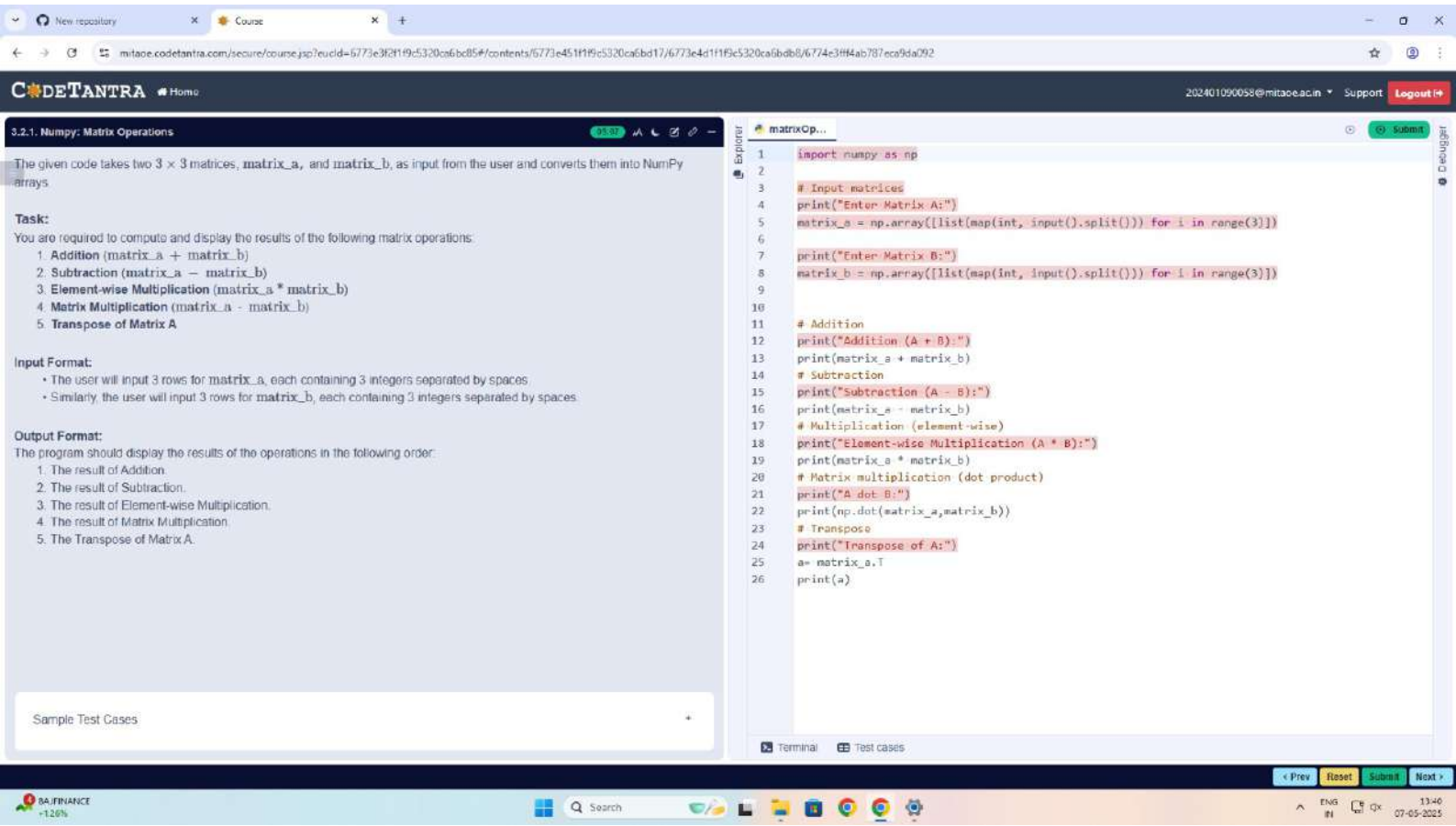
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3.2.1. Numpy: Matrix Operations
The given code takes two 3 × 3 matrices, matrix_a, and matrix_b, as input from the user and converts them into NumPy arrays.
Task:
You are required to compute and display the results of the following matrix operations:
1. Addition (matrix_a + matrix_b)
2. Subtraction (matrix_a − matrix_b)
3. Element-wise Multiplication (matrix_a * matrix_b)
4. Matrix Multiplication (matrix_a · matrix_b)
5. Transpose of Matrix A
Input Format:
• The user will input 3 rows for matrix_a, each containing 3 integers separated by spaces.
• Similarly, the user will input 3 rows for matrix_b, each containing 3 integers separated by spaces.
Output Format:
The program should display the results of the operations in the following order:
1. The result of Addition.
2. The result of Subtraction.
3. The result of Element-wise Multiplication.
4. The result of Matrix Multiplication.
5. The Transpose of Matrix A.
Sample Test Cases
Explorer
matrixOp...
Submit
Debugger
1 import numpy as np
2
3 # Input matrices
4 print("Enter Matrix A:")
5 matrix_a = np.array([list(map(int, input().split())) for i in range(3)])
6
7 print("Enter Matrix B:")
8 matrix_b = np.array([list(map(int, input().split())) for i in range(3)])
9
10
11 # Addition
12 print("Addition (A + B):")
13 print(matrix_a + matrix_b)
14 # Subtraction
15 print("Subtraction (A - B):")
16 print(matrix_a - matrix_b)
17 # Multiplication (element-wise)
18 print("Element-wise Multiplication (A * B):")
19 print(matrix_a * matrix_b)
20 # Matrix multiplication (dot product)
21 print("A dot B:")
22 print(np.dot(matrix_a,matrix_b))
23 # Transpose
24 print("Transpose of A:")
25 a= matrix_a.T
26 print(a)
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Test cases
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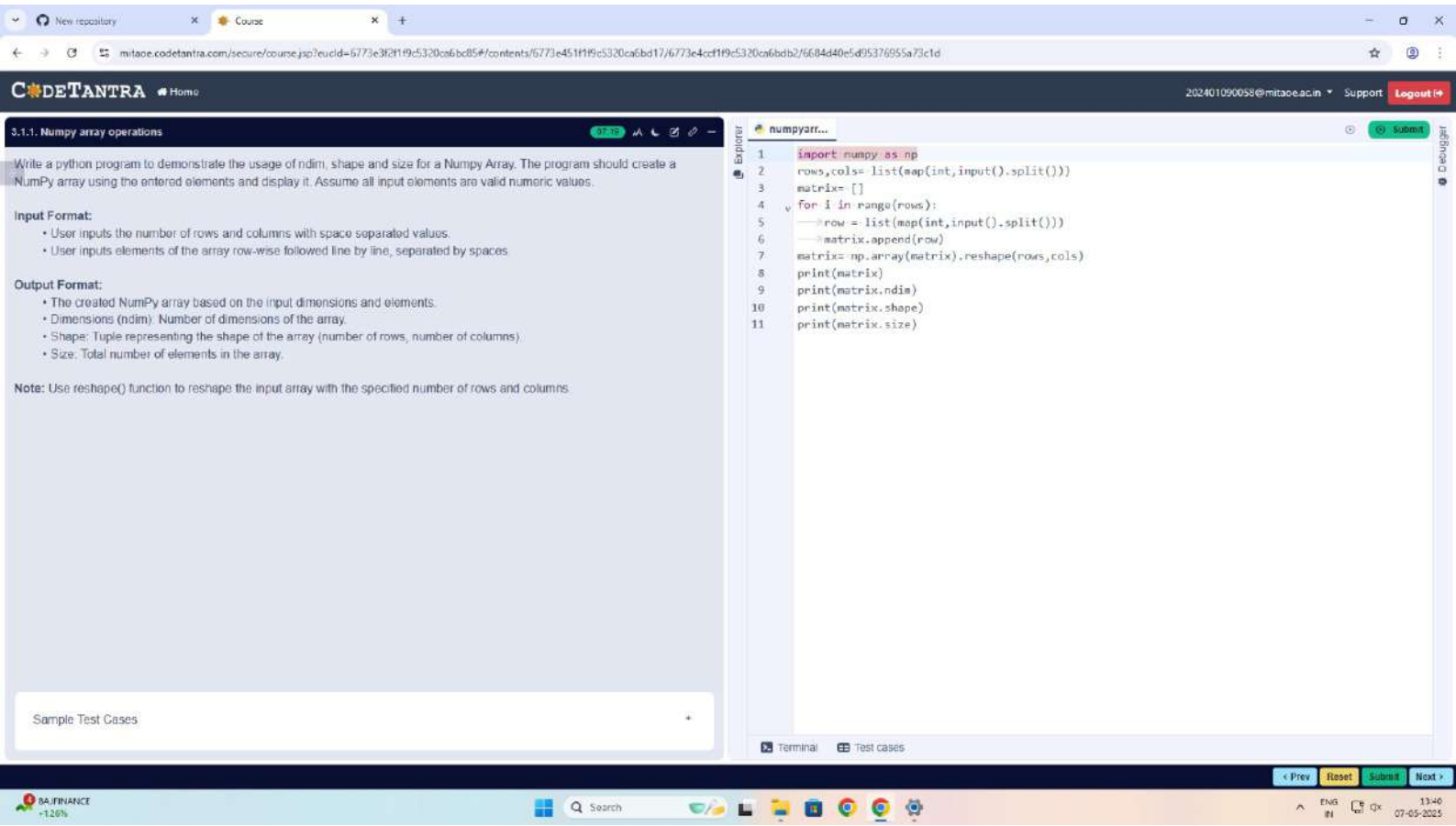
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3.1.1. Numpy array operations
Write a python program to demonstrate the usage of ndim, shape and size for a Numpy Array. The program should create a NumPy array using the entered elements and display it. Assume all input elements are valid numeric values.
Input Format:
• User inputs the number of rows and columns with space separated values.
• User inputs elements of the array row-wise followed line by line, separated by spaces.
Output Format:
• The created NumPy array based on the input dimensions and elements.
• Dimensions (ndim): Number of dimensions of the array.
• Shape: Tuple representing the shape of the array (number of rows, number of columns).
• Size: Total number of elements in the array.
Note: Use reshape() function to reshape the input array with the specified number of rows and columns.
Sample Test Cases
numpyarr...
Submit
Explorer
CodeTantra
1 import numpy as np
2 rows,cols= list(map(int,input().split()))
3 matrix= []
4 for i in range(rows):
5 row = list(map(int,input().split()))
6 matrix.append(row)
7 matrix= np.array(matrix).reshape(rows,cols)
8 print(matrix)
9 print(matrix.ndim)
10 print(matrix.shape)
11 print(matrix.size)
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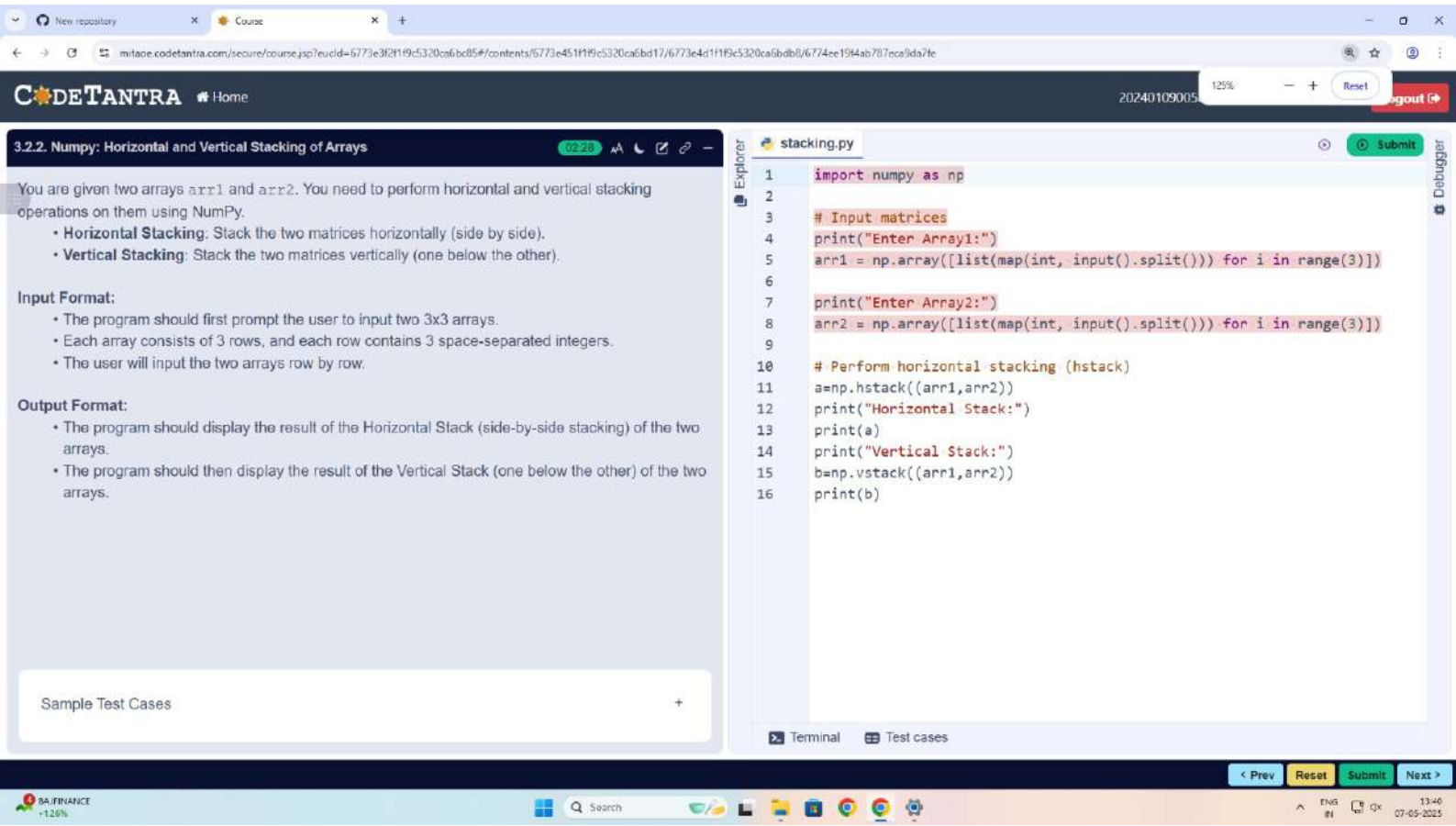
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3.2.2. Numpy: Horizontal and Vertical Stacking of Arrays
02:28
You are given two arrays arr1 and arr2. You need to perform horizontal and vertical stacking operations on them using NumPy.
• Horizontal Stacking: Stack the two matrices horizontally (side by side).
• Vertical Stacking: Stack the two matrices vertically (one below the other).
Input Format:
• The program should first prompt the user to input two 3x3 arrays.
• Each array consists of 3 rows, and each row contains 3 space-separated integers.
• The user will input the two arrays row by row.
Output Format:
• The program should display the result of the Horizontal Stack (side-by-side stacking) of the two arrays.
• The program should then display the result of the Vertical Stack (one below the other) of the two arrays.
Sample Test Cases
Explorer
stacking.py
Submit
Debugger
1 import numpy as np
2
3 # Input matrices
4 print("Enter Array1:")
5 arr1 = np.array([list(map(int, input().split())) for i in range(3)])
6
7 print("Enter Array2:")
8 arr2 = np.array([list(map(int, input().split())) for i in range(3)])
9
10 # Perform horizontal stacking (hstack)
11 a=np.hstack((arr1,arr2))
12 print("Horizontal Stack:")
13 print(a)
14 print("Vertical Stack:")
15 b=np.vstack((arr1,arr2))
16 print(b)
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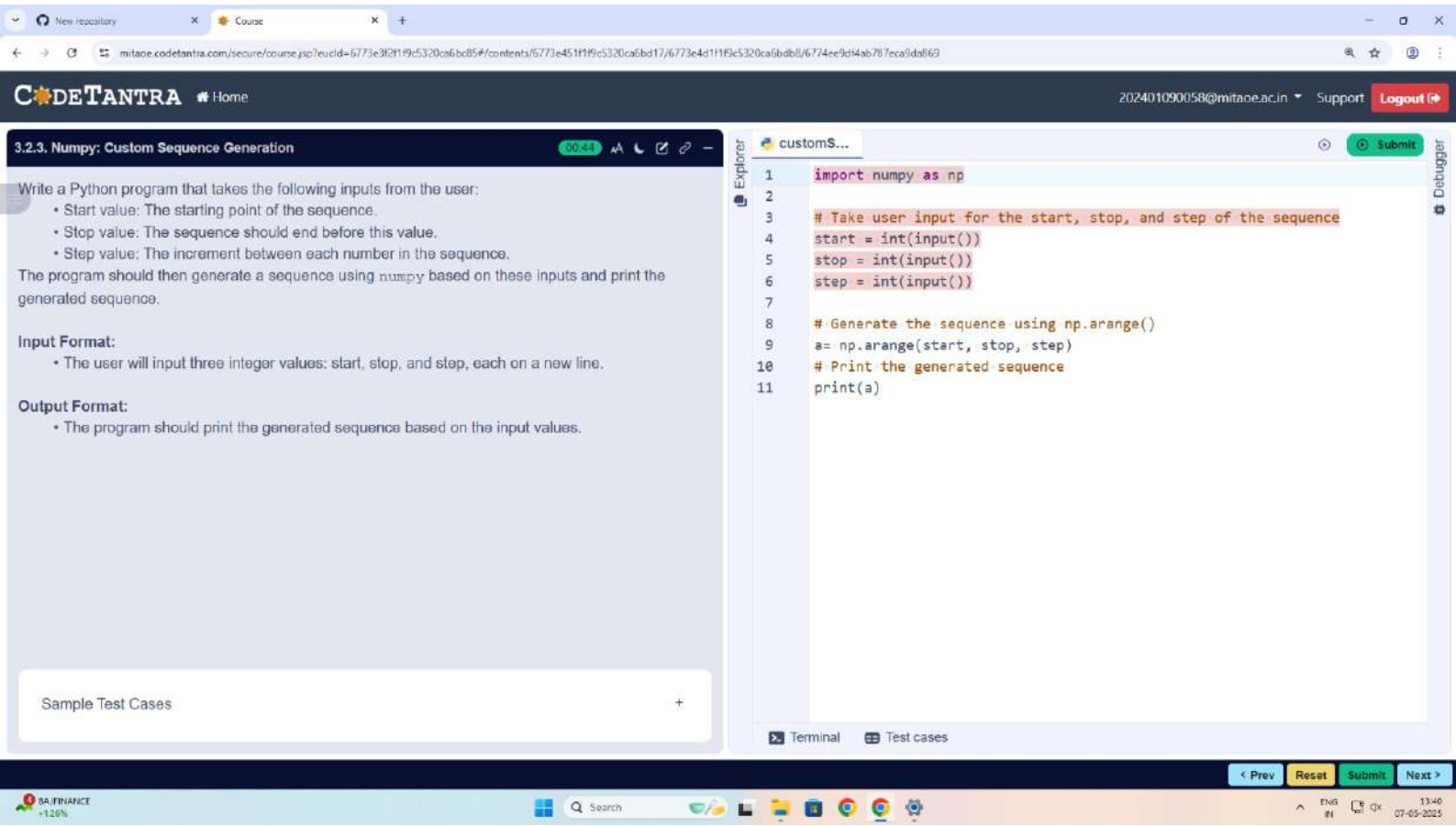
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3.2.3. Numpy: Custom Sequence Generation
00:44
Write a Python program that takes the following inputs from the user:
• Start value: The starting point of the sequence.
• Stop value: The sequence should end before this value.
• Step value: The increment between each number in the sequence.
The program should then generate a sequence using numpy based on these inputs and print the generated sequence.
Input Format:
• The user will input three integer values: start, stop, and step, each on a new line.
Output Format:
• The program should print the generated sequence based on the input values.
Sample Test Cases
customS...
Submit
Explorer
Debugger
1 import numpy as np
2
3 # Take user input for the start, stop, and step of the sequence
4 start = int(input())
5 stop = int(input())
6 step = int(input())
7
8 # Generate the sequence using np.arange()
9 a= np.arange(start, stop, step)
10 # Print the generated sequence
11 print(a)
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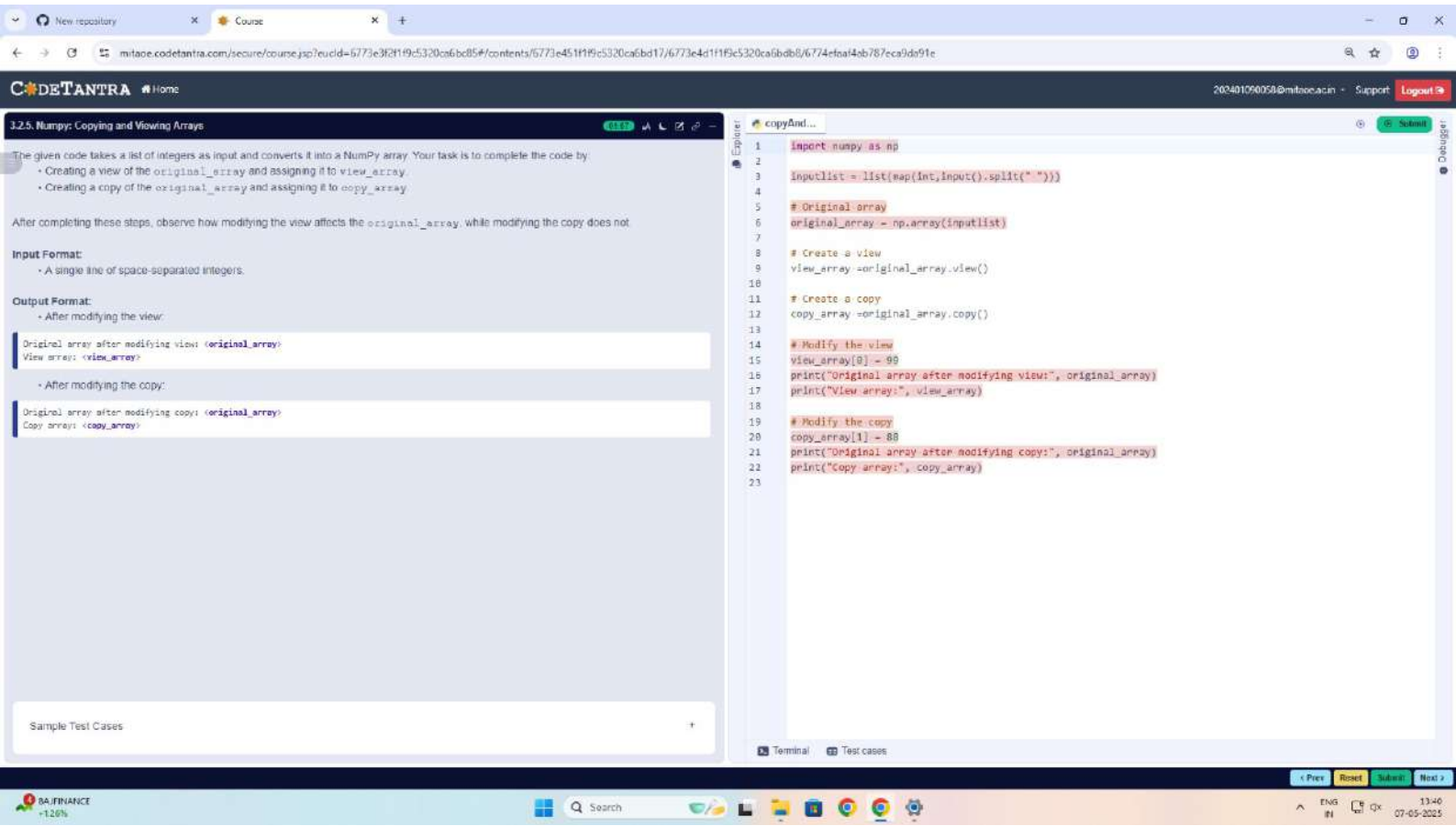
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3.2.5. Numpy: Copying and Viewing Arrays
The given code takes a list of integers as input and converts it into a NumPy array. Your task is to complete the code by:
• Creating a view of the original_array and assigning it to view_array.
• Creating a copy of the original_array and assigning it to copy_array.
After completing these steps, observe how modifying the view affects the original_array, while modifying the copy does not.
Input Format:
• A single line of space-separated integers.
Output Format:
• After modifying the view:
Original array after modifying view: <original_array>
View array: <view_array>
• After modifying the copy:
Original array after modifying copy: <original_array>
Copy array: <copy_array>
Sample Test Cases
copyAnd...
Submit
Explorer
Debugger
1 import numpy as np
2
3 inputlist = list(map(int,input().split(" ")))
4
5 # Original array
6 original_array = np.array(inputlist)
7
8 # Create a view
9 view_array =original_array.view()
10
11 # Create a copy
12 copy_array =original_array.copy()
13
14 # Modify the view
15 view_array[0] = 99
16 print("Original array after modifying view:", original_array)
17 print("View array:", view_array)
18
19 # Modify the copy
20 copy_array[1] = 88
21 print("Original array after modifying copy:", original_array)
22 print("Copy array:", copy_array)
23
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Test cases
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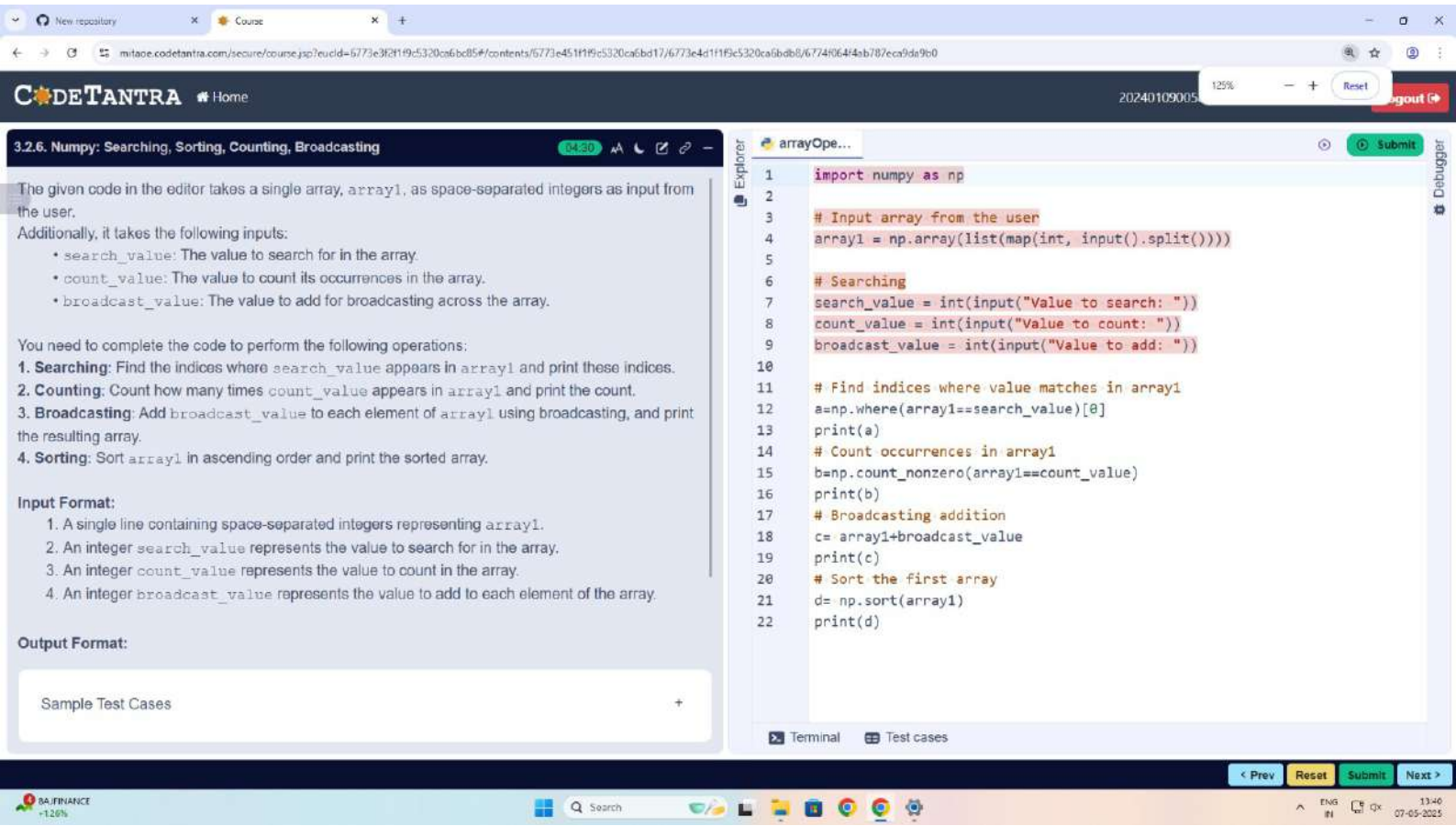
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3.2.6. Numpy: Searching, Sorting, Counting, Broadcasting
04:30
The given code in the editor takes a single array, array1, as space-separated integers as input from the user.
Additionally, it takes the following inputs:
• search_value: The value to search for in the array.
• count_value: The value to count its occurrences in the array.
• broadcast_value: The value to add for broadcasting across the array.
You need to complete the code to perform the following operations:
1. Searching: Find the indices where search_value appears in array1 and print these indices.
2. Counting: Count how many times count_value appears in array1 and print the count.
3. Broadcasting: Add broadcast_value to each element of array1 using broadcasting, and print the resulting array.
4. Sorting: Sort array1 in ascending order and print the sorted array.
Input Format:
1. A single line containing space-separated integers representing array1.
2. An integer search_value represents the value to search for in the array.
3. An integer count_value represents the value to count in the array.
4. An integer broadcast_value represents the value to add to each element of the array.
Output Format:
Sample Test Cases
Explorer
arrayOpe...
Submit
Debugger
1 import numpy as np
2
3 # Input array from the user
4 array1 = np.array(list(map(int, input().split())))
5
6 # Searching
7 search_value = int(input("Value to search: "))
8 count_value = int(input("Value to count: "))
9 broadcast_value = int(input("Value to add: "))
10
11 # Find indices where value matches in array1
12 a=np.where(array1==search_value)[0]
13 print(a)
14 # Count occurrences in array1
15 b=np.count_nonzero(array1==count_value)
16 print(b)
17 # Broadcasting addition
18 c= array1+broadcast_value
19 print(c)
20 # Sort the first array
21 d= np.sort(array1)
22 print(d)
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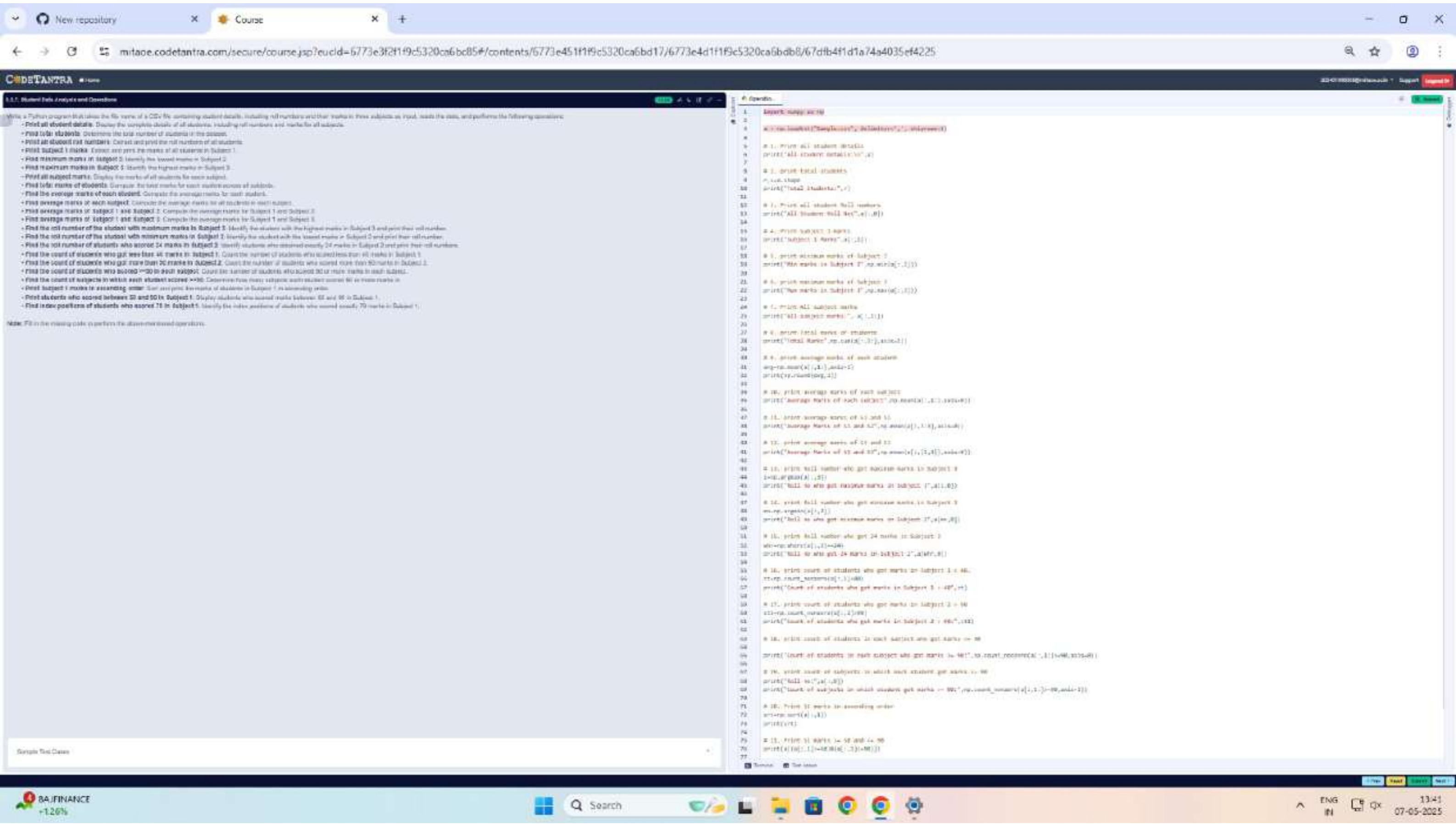
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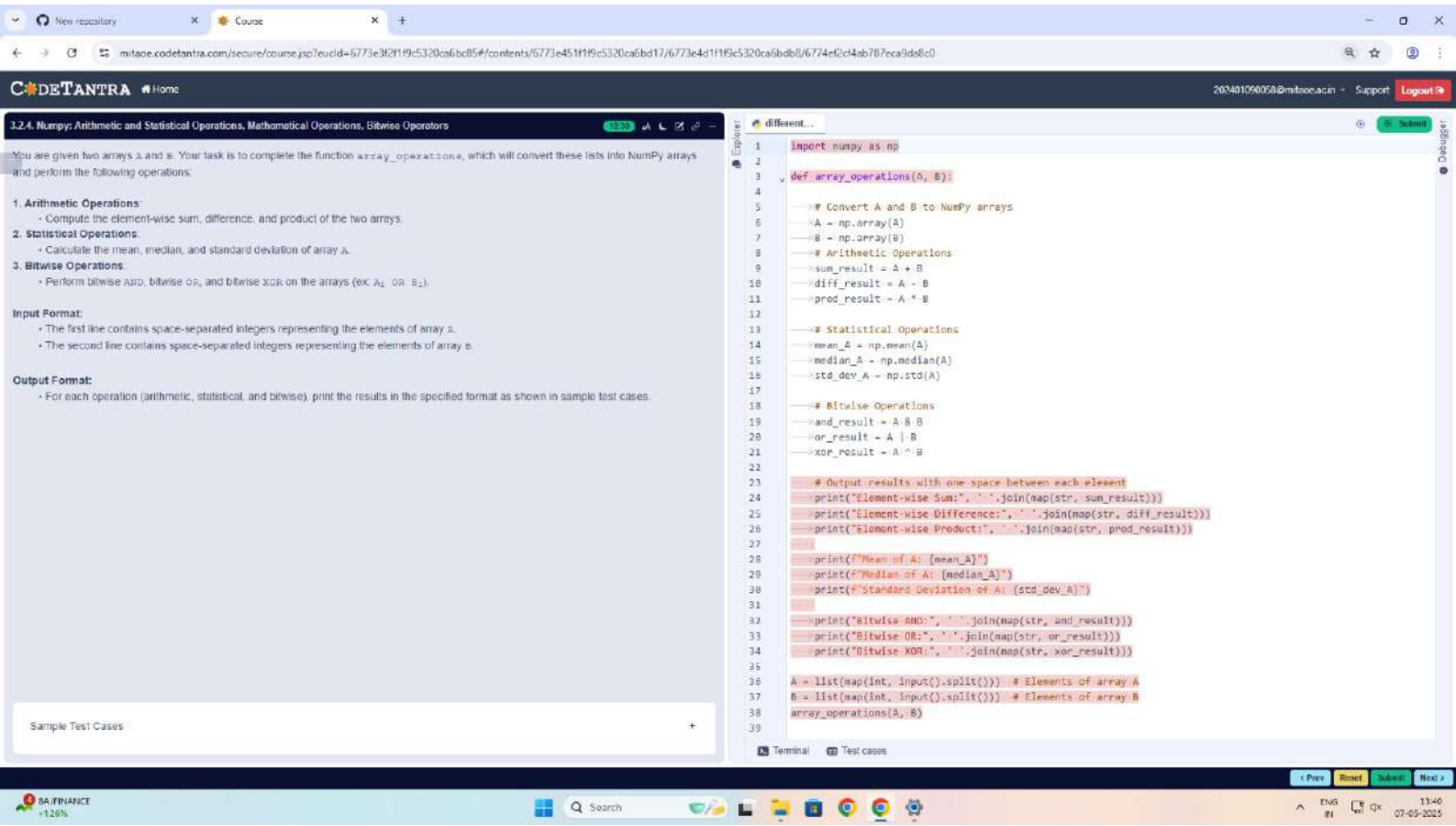
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3.2.4. Numpy: Arithmetic and Statistical Operations, Mathematical Operations, Bitwise Operators
10:20
You are given two arrays A and B. Your task is to complete the function array_operations, which will convert these lists into NumPy arrays and perform the following operations:
1. Arithmetic Operations:
• Compute the element-wise sum, difference, and product of the two arrays.
2. Statistical Operations:
• Calculate the mean, median, and standard deviation of array A.
3. Bitwise Operations:
• Perform bitwise AND, bitwise OR, and bitwise XOR on the arrays (ex: A1 OR B1).
Input Format:
• The first line contains space-separated integers representing the elements of array A.
• The second line contains space-separated integers representing the elements of array B.
Output Format:
• For each operation (arithmetic, statistical, and bitwise), print the results in the specified format as shown in sample test cases.
Sample Test Cases
different...
Submit
Explorer
Debugger
import numpy as np
def array_operations(A, B):
# Convert A and B to NumPy arrays
A = np.array(A)
B = np.array(B)
# Arithmetic Operations
sum_result = A + B
diff_result = A - B
prod_result = A * B
# Statistical Operations
mean_A = np.mean(A)
median_A = np.median(A)
std_dev_A = np.std(A)
# Bitwise Operations
and_result = A & B
or_result = A | B
xor_result = A ^ B
# Output results with one space between each element
print("Element-wise Sum:", ' '.join(map(str, sum_result)))
print("Element-wise Difference:", ' '.join(map(str, diff_result)))
print("Element-wise Product:", ' '.join(map(str, prod_result)))
print(f"Mean of A: {mean_A}")
print(f"Median of A: {median_A}")
print(f"Standard Deviation of A: {std_dev_A}")
print("Bitwise AND:", ' '.join(map(str, and_result)))
print("Bitwise OR:", ' '.join(map(str, or_result)))
print("Bitwise XOR:", ' '.join(map(str, xor_result)))
A = list(map(int, input().split())) # Elements of array A
B = list(map(int, input().split())) # Elements of array B
array_operations(A, B)
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Test cases
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