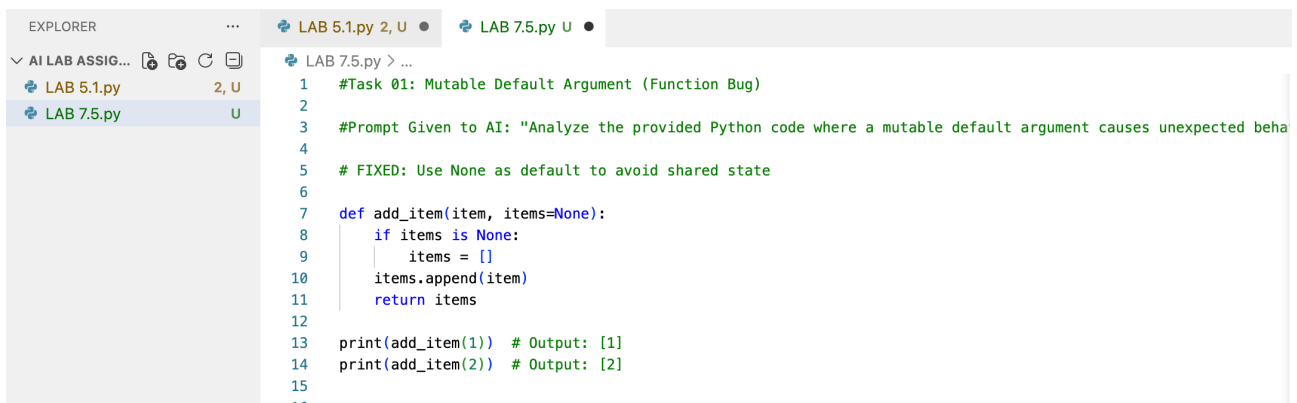


Student Details :

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- **Branch & Year:** B.Tech, 3rd Year
- **College:** SR University
- **Assignment Number:** Lab Assignment 7.5

Task 01: Mutable Default Argument (Function Bug)

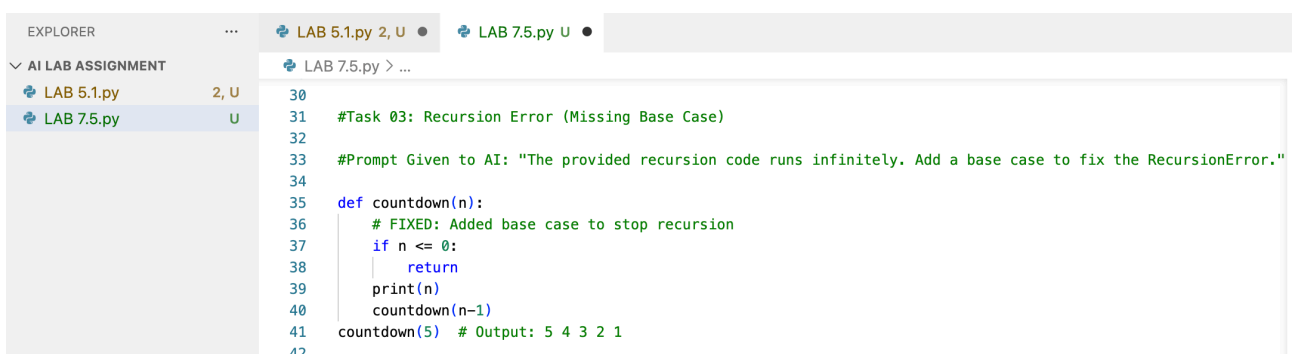


The screenshot shows a code editor with a file explorer on the left and a code editor on the right. The file explorer shows a folder 'AI LAB ASSIGNMENT' with two files: 'LAB 5.1.py' and 'LAB 7.5.py'. The code editor shows the content of 'LAB 7.5.py' with the following code:

```
1 #Task 01: Mutable Default Argument (Function Bug)
2
3 #Prompt Given to AI: "Analyze the provided Python code where a mutable default argument causes unexpected beha
4
5 # FIXED: Use None as default to avoid shared state
6
7 def add_item(item, items=None):
8     if items is None:
9         items = []
10    items.append(item)
11    return items
12
13 print(add_item(1)) # Output: [1]
14 print(add_item(2)) # Output: [2]
15
16
```

Explanation of Code: The original code used `items= []` as a default argument. In Python, default arguments are created only once when the function is defined, not every time it is called. This meant the list was shared across all function calls, leading to data persisting between calls. The fix sets the default to `None` and creates a new empty list inside the function, ensuring each call gets its own fresh list

Task 02: Floating-Point Precision Error

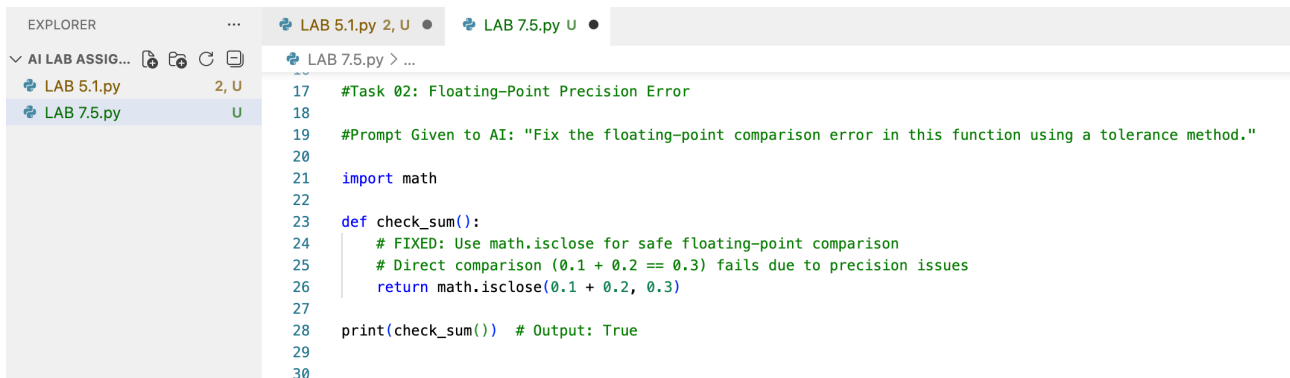


The screenshot shows a code editor with a file explorer on the left and a code editor on the right. The file explorer shows a folder 'AI LAB ASSIGNMENT' with two files: 'LAB 5.1.py' and 'LAB 7.5.py'. The code editor shows the content of 'LAB 7.5.py' with the following code:

```
30
31 #Task 03: Recursion Error (Missing Base Case)
32
33 #Prompt Given to AI: "The provided recursion code runs infinitely. Add a base case to fix the RecursionError."
34
35 def countdown(n):
36     # FIXED: Added base case to stop recursion
37     if n <= 0:
38         return
39     print(n)
40     countdown(n-1)
41 countdown(5) # Output: 5 4 3 2 1
42
```

Explanation of Code: Computers store floating-point numbers as binary approximations, so $0.1 + 0.2$ actually results in 0.30000000000000004 , which is not exactly equal to 0.3 . The corrected code uses `math.isclose()`, which compares the values with a small tolerance to handle these minor precision differences correctly.

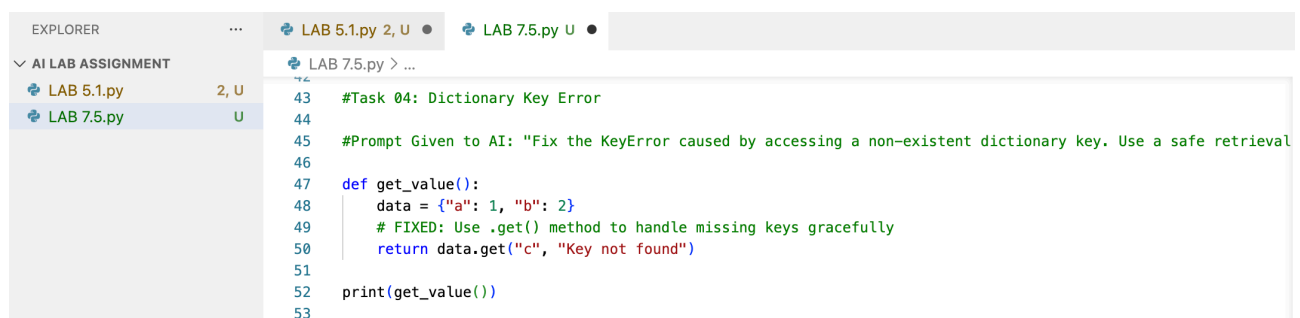
Task 03: Recursion Error (Missing Base Case)



```
EXPLORER
  AI LAB ASSIGNMENT
    LAB 5.1.py 2, U
    LAB 7.5.py U
  LAB 7.5.py > ...
    17 #Task 02: Floating-Point Precision Error
    18
    19 #Prompt Given to AI: "Fix the floating-point comparison error in this function using a tolerance method."
    20
    21 import math
    22
    23 def check_sum():
    24     # FIXED: Use math.isclose for safe floating-point comparison
    25     # Direct comparison (0.1 + 0.2 == 0.3) fails due to precision issues
    26     return math.isclose(0.1 + 0.2, 0.3)
    27
    28 print(check_sum()) # Output: True
    29
    30
```

Explanation of Code: The original function lacked a "base case," meaning it would call `countdown(n-1)` forever until the program crashed with a `RecursionError`. The fix adds a condition `if n <= 0: return`, which tells the function when to stop calling itself, ensuring the program terminates safely.

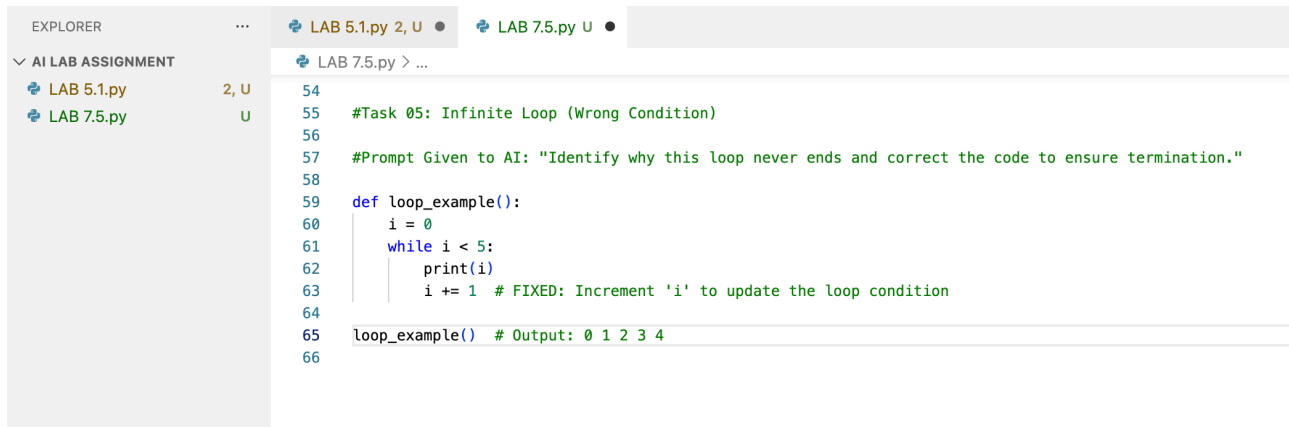
Task 04: Dictionary Key Error



```
EXPLORER
  AI LAB ASSIGNMENT
    LAB 5.1.py 2, U
    LAB 7.5.py U
  LAB 7.5.py > ...
    43 #Task 04: Dictionary Key Error
    44
    45 #Prompt Given to AI: "Fix the KeyError caused by accessing a non-existent dictionary key. Use a safe retrieval
    46
    47 def get_value():
    48     data = {"a": 1, "b": 2}
    49     # FIXED: Use .get() method to handle missing keys gracefully
    50     return data.get("c", "Key not found")
    51
    52 print(get_value())
    53
```

Explanation of Code: Trying to access `data["c"]` directly causes a crash because the key "c" does not exist in the dictionary. The fixed code uses the `.get()` method, which safely returns `None` (or a custom default message like "Key not found") instead of crashing the program.

Task 05: Infinite Loop (Wrong Condition)



```
54
55 #Task 05: Infinite Loop (Wrong Condition)
56
57 #Prompt Given to AI: "Identify why this loop never ends and correct the code to ensure termination."
58
59 def loop_example():
60     i = 0
61     while i < 5:
62         print(i)
63         i += 1 # FIXED: Increment 'i' to update the loop condition
64
65 loop_example() # Output: 0 1 2 3 4
66
```

Explanation of Code: The original loop was infinite because the variable `i` was never updated; it stayed at 0, so the condition `i < 5` was always true. The fix adds `i += 1` inside the loop, ensuring that `i` eventually reaches 5 and the loop terminates as expected.

Thank You....