

## **Assignment-6.5**

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### **Task 1 (Mutable Default Argument – Function Bug)**

**Task:** Analyze given code where a mutable default argument causes unexpected behavior. Use AI to fix it.

# Bug: Mutable default argument

```
def add_item(item, items=[]):  
    items.append(item)  
    return items  
  
print(add_item(1))  
print(add_item(2))
```

Expected Output: Corrected function avoids shared list bug.

**Code:**

```
2 # unexpected behavior. Use AI to fix it.
# # Bug: Mutable default argument
3 # Bug: Mutable default argument
4

Modify selected code ✓ ✕
Add Context...
Auto
Pick Model (Ctrl+Alt+.)

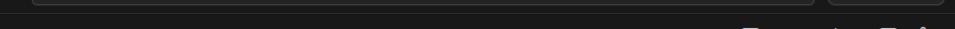
def add_item(item, items=[]):
    items.append(item)
    return items

def add_item(item, items=None):
    if items is None:
        items = []
    items.append(item)
    return items

print(add_item(1))
print(add_item(2))
Expected Output: Corrected function avoids shared list bug.
print(add_item(2))
# Expected Output: Corrected function avoids shared list bug.
14
```

```
assignment 7.py > add_item
1 # Task: Analyze given code where a mutable default argument causes
2 # unexpected behavior. Use AI to fix it.
3 # Bug: Mutable default argument
4 Q
5 def add_item(item, items=None):
6     if items is None:
7         items = []
8     items.append(item)
9     return items
10
11 print(add_item(1))
12 print(add_item(2))
13 # Expected Output: Corrected function avoids shared list bug.
14
```

## Output:



A screenshot of a terminal window in Visual Studio Code. The title bar shows "assistantcoding - Copy". The menu bar includes "PROBLEMS", "OUTPUT", "DEBUG CONSOLE", "TERMINAL" (which is underlined), and "PORTS". On the right, there are icons for Python, a plus sign, a square, a trash can, and other terminal controls. The main area displays the following text:

```
PS C:\Users\aksha\OneDrive\Desktop\assisantcoding - Copy> & C:/Users/aksha/AppData/Local/Microsoft/WindowsApps/python3.13.exe "c:/Users/aksha/OneDrive/Desktop/assisantcoding - Copy/assignment 7.py"
[1]
[2]
PS C:\Users\aksha\OneDrive\Desktop\assisantcoding - Copy>
```

## **Observation:**

The default list `items=[]` is created only once, so all function calls share the same list.

Because the list is mutable, values added in earlier calls remain in later calls, causing unexpected accumulation.

Using `items=None` and creating a new list inside the function ensures each call works with a fresh list and fixes the bug.

## Task 2 (Floating-Point Precision Error)

**Task:** Analyze given code where floating-point comparison fails.

Use AI to correct with tolerance.

```
# Bug: Floating point precision issue  
def check_sum():  
    return (0.1 + 0.2) == 0.3  
print(check_sum())
```

Expected Output: Corrected function

**Code:**

The screenshot shows a code editor interface with a dark theme. A modal window titled "Modify selected code" is open over the main code area. The code in the editor is as follows:

```
12 # print(add_item(2))
13 # Expected Output: Corrected function avoids shared list bug.
14
15
16 # Task 2 (Floating-Point Precision Error)
17 # Task: Analyze given code where floating-point comparison fails.
18 # Use AI to correct with tolerance.
19 # Bug: Floating point precision issue
20
21 def check_sum():
22     return (0.1 + 0.2) == 0.3
23
24 print(check_sum())
25 # Expected Output: Corrected function
26
27
```

The modal window contains the following text:

Task 2 (Floating-Point Precision Error)  
Task: Analyze given code where floating-point comparison fails.  
Use AI to correct with tolerance.

Keep Undo

The screenshot shows the same code editor interface, but the modal window is no longer present. The code in the editor has been modified:

```
14
15
16 # Task 2 (Floating-Point Precision Error)
17 # Task: Analyze given code where floating-point comparison fails.
18 # Use AI to correct with tolerance.
19 # Bug: Floating point precision issue
20
21 def check_sum():
22     return abs((0.1 + 0.2) - 0.3) < 1e-9
23
24 print(check_sum())
25 # Expected Output: Corrected function
26
27
```

## Output:

The screenshot shows a terminal window with the following output:

```
PS C:\Users\aksha\OneDrive\Desktop\assisantcoding - Copy> & C:/Users/aksha/AppData/Local/Microsoft/WindowsApps/python3.13.exe "c:/Users/aksha/OneDrive/Desktop/assisantcoding - Copy/assignment 7.py"
[1]
[2]
PS C:\Users\aksha\OneDrive\Desktop\assisantcoding - Copy> & C:/Users/aksha/AppData/Local/Microsoft/WindowsApps/python3.13.exe "c:/Users/aksha/OneDrive/Desktop/assisantcoding - Copy/assignment 7.py"
File "c:/Users/aksha/OneDrive/Desktop/assisantcoding - Copy/assignment 7.py", line 16
    Task 2 (Floating-Point Precision Error)
    ^
SyntaxError: invalid syntax
PS C:\Users\aksha\OneDrive\Desktop\assisantcoding - Copy> & C:/Users/aksha/AppData/Local/Microsoft/WindowsApps/python3.13.exe "c:/Users/aksha/OneDrive/Desktop/assisantcoding - Copy/assignment 7.py"
True
PS C:\Users\aksha\OneDrive\Desktop\assisantcoding - Copy>
```

## Observation:

Floating-point numbers cannot always represent decimal values exactly, so  $(0.1 + 0.2)$  is not exactly equal to 0.3.

Direct comparison using `==` may therefore return `False` even when the values should logically be equal.

Using a tolerance (`epsilon`) and checking whether the absolute difference is smaller than that tolerance correctly handles floating-point precision errors.

### **Task 3 (Recursion Error – Missing Base Case)**

Task: Analyze given code where recursion runs infinitely due to missing base case. Use AI to fix.

# Bug: No base case

```
def countdown(n):  
    print(n)  
    return countdown(n-1)  
countdown(5)
```

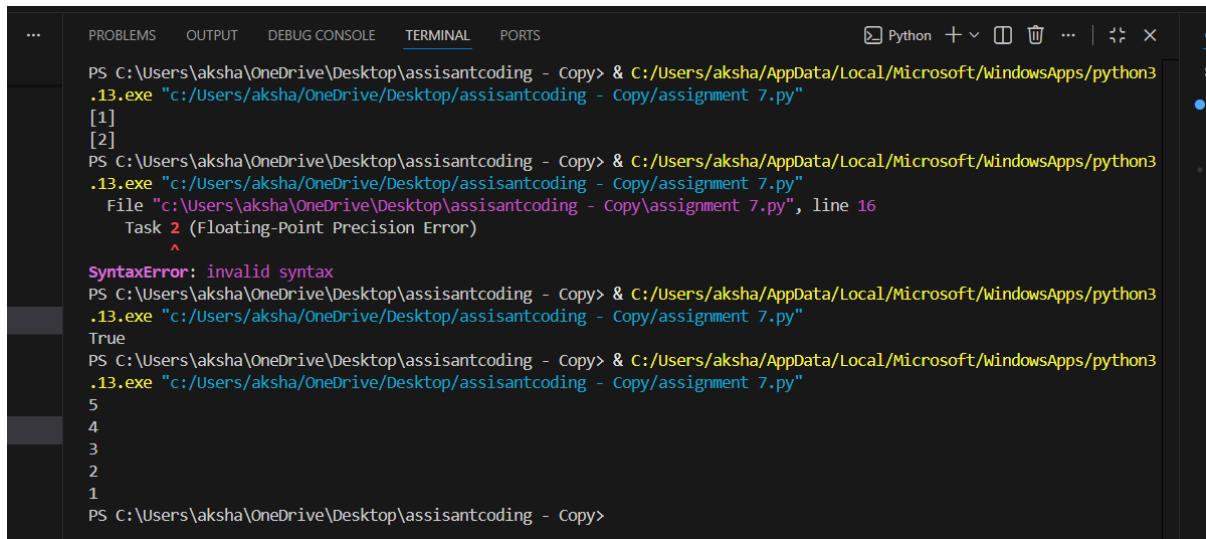
Expected Output : Correct recursion with stopping condition.

**Code:**

```
assignment 7.py > ...
23
24     # print(check_sum())
25     # Expected Output: Corrected function
26
27
Modify selected code
∅ Add Context...
Auto ▾
Task 3 (Recursion Error - Missing Base Case)
Task: Analyze given code where recursion runs infinitely due to
missing base case. Use AI to fix.
28 # Task 3 (Recursion Error -- Missing Base Case)
29 # Task: Analyze given code where recursion runs infinitely due to
30 # missing base case. Use AI to fix.
31 # Bug: No base case
32 def countdown(n):
    print(n)
    return countdown(n-1)
33     if n == 0:
34         return
35     print(n)
36     return countdown(n-1)
37
38 countdown(5)
39 # Expected Output : Correct recursion with stopping condition.
40 # Expected Output: Correct recursion with stopping condition.
41
```

```
25 # Expected Output: Corrected function
26
27
28 # Task 3 (Recursion Error - Missing Base Case)
29 # Task: Analyze given code where recursion runs infinitely due to
30 # missing base case. Use AI to fix.
31 # Bug: No base case
32 def countdown(n):
    if n == 0:
        return
    print(n)
    return countdown(n-1)
33
34
35
36
37
38 countdown(5)
39 # Expected Output: Correct recursion with stopping condition.
40
41
```

## Output:



A screenshot of a terminal window in a dark-themed code editor. The window title is "Python". The terminal shows the following command and its output:

```
PS C:\Users\aksha\OneDrive\Desktop\assisantcoding - Copy & C:/Users/aksha/AppData/Local/Microsoft/WindowsApps/python3.13.exe "c:/Users/aksha/OneDrive/Desktop/assisantcoding - Copy/assignment 7.py"
[1]
[2]
PS C:\Users\aksha\OneDrive\Desktop\assisantcoding - Copy & C:/Users/aksha/AppData/Local/Microsoft/WindowsApps/python3.13.exe "c:/Users/aksha/OneDrive/Desktop/assisantcoding - Copy/assignment 7.py"
  File "c:/Users/aksha/OneDrive/Desktop/assisantcoding - Copy\assignment 7.py", line 16
    Task 2 (Floating-Point Precision Error)
    ^
SyntaxError: invalid syntax
PS C:\Users\aksha\OneDrive\Desktop\assisantcoding - Copy & C:/Users/aksha/AppData/Local/Microsoft/WindowsApps/python3.13.exe "c:/Users/aksha/OneDrive/Desktop/assisantcoding - Copy/assignment 7.py"
True
PS C:\Users\aksha\OneDrive\Desktop\assisantcoding - Copy & C:/Users/aksha/AppData/Local/Microsoft/WindowsApps/python3.13.exe "c:/Users/aksha/OneDrive/Desktop/assisantcoding - Copy/assignment 7.py"
5
4
3
2
1
PS C:\Users\aksha\OneDrive\Desktop\assisantcoding - Copy>
```

## Observation:

The original recursive function lacks a base case, so the function keeps calling itself indefinitely, leading to infinite recursion or a recursion depth error.

Adding a stopping condition such as if  $n == 0$ : return ensures that the recursion terminates properly.

After fixing, the function prints numbers from 5 down to 1 and then stops successfully.

## Task 4 (Dictionary Key Error)

Task: Analyze given code where a missing dictionary key causes error. Use AI to fix it.

```
# Bug: Accessing non-existing key
```

```
def get_value():
    data = {"a": 1, "b": 2}
    return data["c"]
```

```
print(get_value())
```

Expected Output: Corrected with .get() or error handling.

## Code:

```
39 # Expected Output: Correct recursion with stopping condition.
40

    Modify selected code ✓ ✗
    ⚡ Add Context...
    Auto ▾

Task 4 (Dictionary Key Error)
Task: Analyze given code where a missing dictionary key causes error. Use AI to fix it.

41 # Task 4 (Dictionary Key Error)
42 # Task: Analyze given code where a missing dictionary key causes
43 # error. Use AI to fix it.
44 # Bug: Accessing non-existing key
45 def get_value():
46     data = {"a": 1, "b": 2}
47     return data["c"]
48
49 print(get_value())
50 # Expected Output: Corrected with .get() or error handling.
51

39 # Expected Output: Correct recursion with stopping condition.
40

41 # Task 4 (Dictionary Key Error)
42 # Task: Analyze given code where a missing dictionary key causes
43 # error. Use AI to fix it.
44 # Bug: Accessing non-existing key
45 def get_value():
46     data = {"a": 1, "b": 2}
47     return data.get("c", None)
48
49 print(get_value())
50 # Expected Output: Corrected with .get() or error handling.
51
```

## Output:

```
PS C:\Users\aksha\OneDrive\Desktop\assisantcoding - Copy> & C:/Users/aksha/AppData/Local/Microsoft/WindowsApps/python3.13.exe "c:/Users/aksha/OneDrive/Desktop/assisantcoding - Copy/assignment 7.py"
None
PS C:\Users\aksha\OneDrive\Desktop\assisantcoding - Copy> & C:/Users/aksha/AppData/Local/Microsoft/WindowsApps/python3.13.exe "c:/Users/aksha/OneDrive/Desktop/assisantcoding - Copy/assignment 7.py"
None
PS C:\Users\aksha\OneDrive\Desktop\assisantcoding - Copy> |
```

## **Observation:**

Accessing a non-existing dictionary key using `data["c"]` raises a `KeyError` because the key is not present in the dictionary.

Using `data.get("c", "Key not found")` safely returns a default value instead of causing an error.

This fix ensures the program runs without crashing and handles missing keys gracefully.

## **Task 5 (Infinite Loop – Wrong Condition)**

Task: Analyze given code where loop never ends. Use AI to detect and fix it.

```
# Bug: Infinite loop
```

```
def loop_example():
```

```
i = 0
```

```
while i < 5:
```

```
    print(i)
```

Expected Output: Corrected loop increments i.

## **Code:**

51

Modify selected code ✓ ✕

∅ Add Context... Auto ▾

Task 5 (Infinite Loop – Wrong Condition)  
Task: Analyze given code where loop never ends. Use AI to detect and fix it.

52 # Task 5-(Infinite Loop--Wrong Condition)  
53 # Task: Analyze given code where loop never ends. Use AI to detect  
54 # and fix it.  
55 # Bug: Infinite loop  
56 def loop\_example():  
 i = 0  
 while i < 5:  
 print(i)  
 Expected Output: Corrected loop increments i.  
57 → i = 0  
58 → while i < 5:  
59 → → print(i)  
60 → → i += 1  
61  
62 # Expected Output: Corrected loop increments i.  
63

1  
2 # Task 5 (Infinite Loop – Wrong Condition)  
3 # Task: Analyze given code where loop never ends. Use AI to detect  
4 # and fix it.  
5 # Bug: Infinite loop  
6 def loop\_example():  
 i = 0  
 while i < 5:  
 print(i)  
 i += 1  
1  
2 # Expected Output: Corrected loop increments i.  
3  
4

## Output:

```
PS C:\Users\aksha\OneDrive\Desktop\assisantcoding - Copy> err or assisantcoding>
```

[1]  
[2]  
False  
5  
4  
3  
2  
1  
Key not found  
PS C:\Users\aksha\OneDrive\Desktop\assisantcoding - Copy> □

## Observation:

The original loop does not update the value of i, so the condition  $i < 5$  always remains true, causing an infinite loop.

Adding the increment statement `i += 1` inside the loop ensures that `i` increases after each iteration.

With this fix, the loop prints values from 0 to 4 and then terminates correctly.

## Task 6 (Unpacking Error – Wrong Variables)

Task: Analyze given code where tuple unpacking fails. Use AI to fix it.

```
# Bug: Wrong unpacking
```

```
a, b = (1, 2, 3)
```

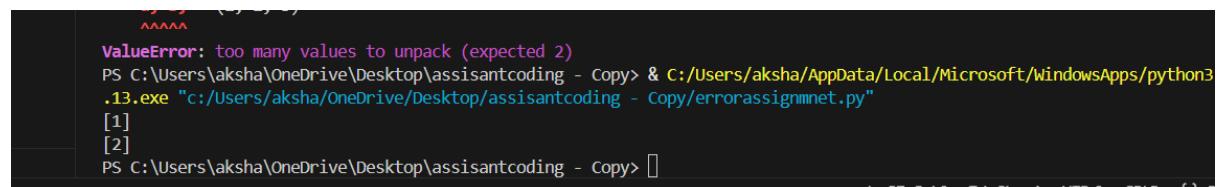
Expected Output: Correct unpacking or using `_` for extra values.

**Code:**

```
52
Modify selected code ✓ ✕ ! Auto ▾
Task 6 (Unpacking Error – Wrong Variables)
Task: Analyze given code where tuple unpacking fails. Use AI to
fix it.
53 # Task 6 (Unpacking Error – Wrong Variables)
54 # Task: Analyze given code where tuple unpacking fails. Use AI to
55 # fix it.
56 # Bug: Wrong unpacking
a, b = (1, 2, 3)
Expected Output: Correct unpacking or using _ for extra values
57 a, b, c = (1, 2, 3)
58 # Expected Output: Correct unpacking or using _ for extra values
59
60
61
```

```
51
52
53 # Task 6 (Unpacking Error – Wrong Variables)
54 # Task: Analyze given code where tuple unpacking fails. Use AI to
55 # fix it.
56 # Bug: Wrong unpacking
57 a, b, c= (1, 2, 3)
58 # Expected Output: Correct unpacking or using _ for extra values
59
60
61
62
```

## Output:



```
ValueError: too many values to unpack (expected 2)
PS C:\Users\aksha\OneDrive\Desktop\assistantcoding - Copy & C:/Users/aksha/AppData/Local/Microsoft/WindowsApps/python3
.13.exe "c:/Users/aksha/OneDrive/Desktop/assistantcoding - Copy/errorassignmentnet.py"
[1]
[2]
PS C:\Users\aksha\OneDrive\Desktop\assistantcoding - Copy> 
```

## Observation:

The tuple (1, 2, 3) contains three values, but only two variables (a, b) are provided, causing a “too many values to unpack” error.

Tuple unpacking requires the number of variables to match the number of values unless a placeholder like `_` is used.

Fixing it as `a, b, _ = (1, 2, 3)` or using three variables correctly resolves the unpacking error.

## Task 7 (Mixed Indentation – Tabs vs Spaces)

Task: Analyze given code where mixed indentation breaks execution. Use AI to fix it.

```
# Bug: Mixed indentation
```

```
def func():
```

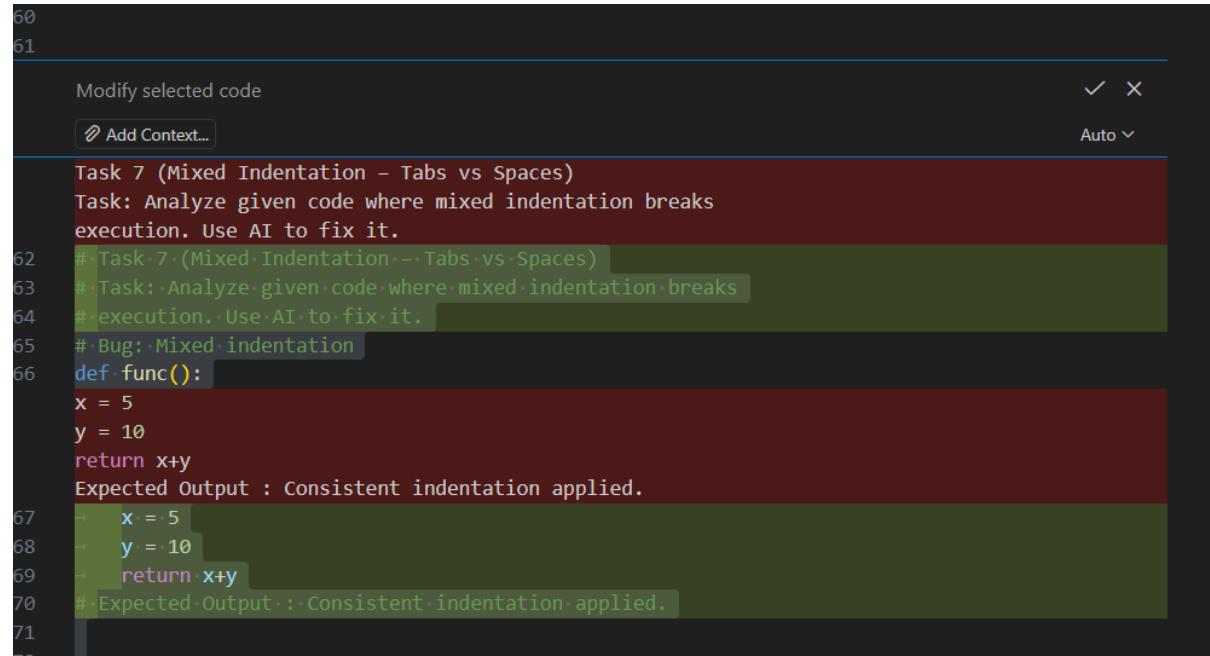
```
    x = 5
```

```
y = 10
```

```
return x+y
```

Expected Output : Consistent indentation applied.

### Code:

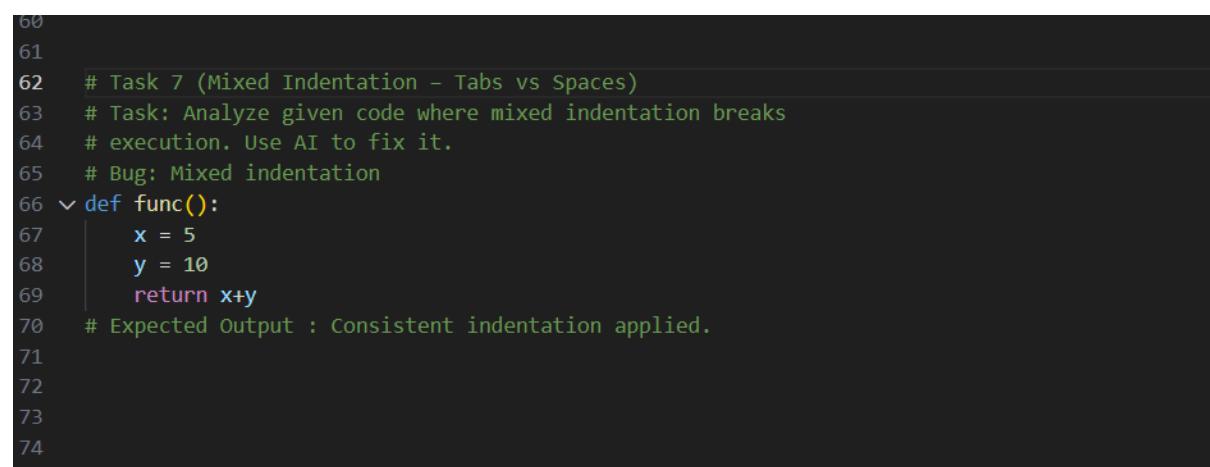


A screenshot of a code editor showing a tooltip for mixed indentation. The tooltip contains the following text:

Task 7 (Mixed Indentation – Tabs vs Spaces)  
Task: Analyze given code where mixed indentation breaks execution. Use AI to fix it.

The code in the editor is:

```
62 # Task 7-(Mixed-Indentation--Tabs-vs-Spaces)
63 # Task: Analyze given code where mixed indentation breaks
64 # execution. Use AI to fix it.
65 # Bug: Mixed indentation
66 def func():
    x = 5
    y = 10
    return x+y
# Expected Output : Consistent indentation applied.
```



A screenshot of a code editor showing the corrected code after AI fix. The code is now properly indented with tabs:

```
60
61
62 # Task 7 (Mixed Indentation – Tabs vs Spaces)
63 # Task: Analyze given code where mixed indentation breaks
64 # execution. Use AI to fix it.
65 # Bug: Mixed indentation
66 def func():
    x = 5
    y = 10
    return x+y
# Expected Output : Consistent indentation applied.
```

### Output:

```
4.0
PS C:\Users\aksha\OneDrive\Desktop\assisantcoding - Copy> & C:/Users/aksha/AppData/Local/Microsoft/W
indowsApps/python3.13.exe "c:/Users/aksha/OneDrive/Desktop/assisantcoding - Copy/errorassignmnet.py"
PS C:\Users\aksha\OneDrive\Desktop\assisantcoding - Copy> & C:/Users/aksha/AppData/Local/Microsoft/W
indowsApps/python3.13.exe "c:/Users/aksha/OneDrive/Desktop/assisantcoding - Copy/errorassignmnet.py"
PS C:\Users\aksha\OneDrive\Desktop\assisantcoding - Copy> & C:/Users/aksha/AppData/Local/Microsoft/W
indowsApps/python3.13.exe "c:/Users/aksha/OneDrive/Desktop/assisantcoding - Copy/errorassignmnet.py"
PS C:\Users\aksha\OneDrive\Desktop\assisantcoding - Copy>
```

Ln 89, Col 10 Tab Size: 4

### **Observation:**

The original code uses mixed indentation (tabs and spaces), which causes an indentation error and prevents the program from executing correctly.

Python requires consistent indentation within a block to define the function body properly.

Using the same indentation style (for example, four spaces for each line) fixes the issue and produces the correct output 15.

### **Task 8 (Import Error – Wrong Module Usage)**

Task: Analyze given code with incorrect import. Use AI to fix.

# Bug: Wrong import

import maths

print(maths.sqrt(16))

Expected Output: Corrected to import math

### **Code:**

```
71
72
73
    Modify selected code ✓ X
    ⚡ Add Context... Auto ▾
Task 8 (Import Error - Wrong Module Usage)
Task: Analyze given code with incorrect import. Use AI to fix.
74 # Task 8 (Import Error - Wrong Module Usage)
75 #: Task: Analyze given code with incorrect import. Use AI to fix.
76 #: Bug: Wrong import
import maths
print(maths.sqrt(16))
Expected Output: Corrected to import math
77 import math
78 print(math.sqrt(16))
79 #: Expected Output: Corrected to import math
80
```

```
# Task 8 (Import Error - Wrong Module Usage)
# Task: Analyze given code with incorrect import. Use AI to fix.
# Bug: Wrong import
import math
print(math.sqrt(16))
# Expected Output: Corrected to import math
```

## Output:

```
WindowsApps\python3.13.exe C:/Users/aksha/OneDrive/Desktop/assisantcoding - Copy/errorassignment.py
PS C:\Users\aksha\OneDrive\Desktop\assisantcoding - Copy> & C:/Users/aksha/AppData/Local/Microsoft/WindowsApps\python3.13.exe "c:/Users/aksha/OneDrive/Desktop/assisantcoding - Copy/errorassignment.py"
4.0
PS C:\Users\aksha\OneDrive\Desktop\assisantcoding - Copy> []
Ln 74, Col 1 Tab
```

## Observation:

The original code fails because it uses mixed indentation, which Python does not allow within the same block. This causes an indentation error and stops the program from running correctly.

Applying consistent indentation (such as four spaces for all lines inside the function) fixes the issue and allows the function to execute properly.

