Assignment -7.5

Hallticket no:2303A510A6 **Batch no:02**

Task1: 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)

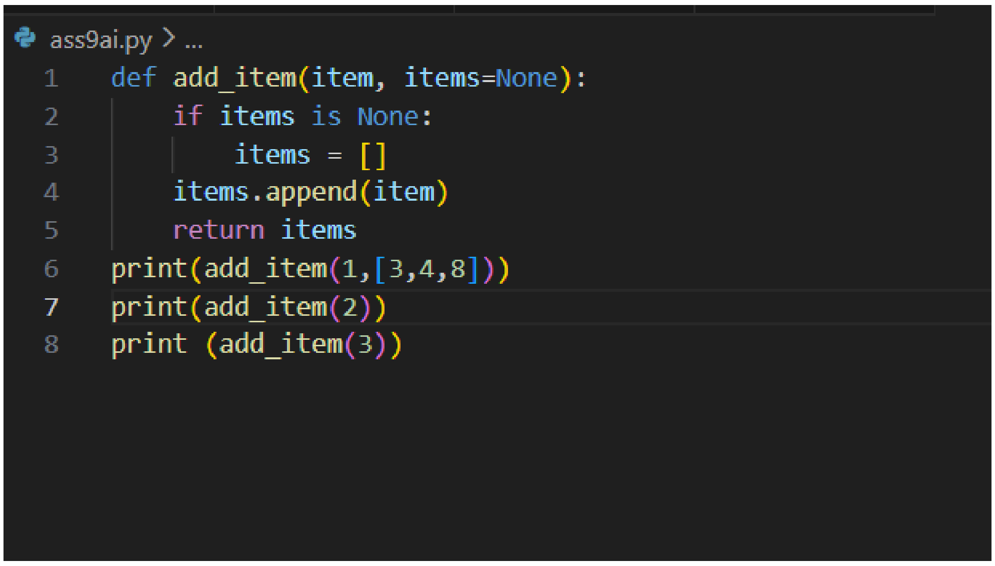
return items

print(add_item(1))

print(add_item(2))

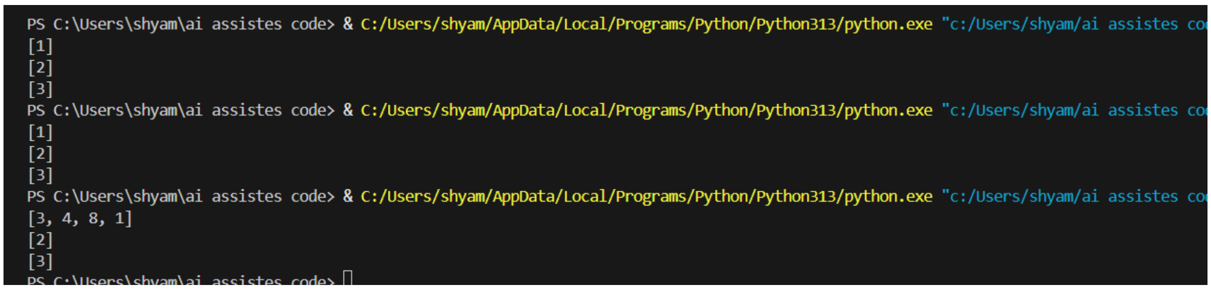
Expected Output: Corrected function avoids shared list bust

Code:



```python
def add_item(item, items=None):
    if items is None:
        items = []
    items.append(item)
    return items
print(add_item(1,[3,4,8]))
print(add_item(2))
print (add_item(3))
```

Output:



```
PS C:\Users\shyam\ai assistes code> & C:/Users/shyam/AppData/Local/Programs/Python/Python313/python.exe "c:/Users/shyam/ai assistes co
[1]
[2]
[3]
PS C:\Users\shyam\ai assistes code> & C:/Users/shyam/AppData/Local/Programs/Python/Python313/python.exe "c:/Users/shyam/ai assistes co
[1]
[2]
[3]
PS C:\Users\shyam\ai assistes code> & C:/Users/shyam/AppData/Local/Programs/Python/Python313/python.exe "c:/Users/shyam/ai assistes co
[3, 4, 8, 1]
[2]
[3]
PS C:\Users\shyam\ai assistes code> 
```

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

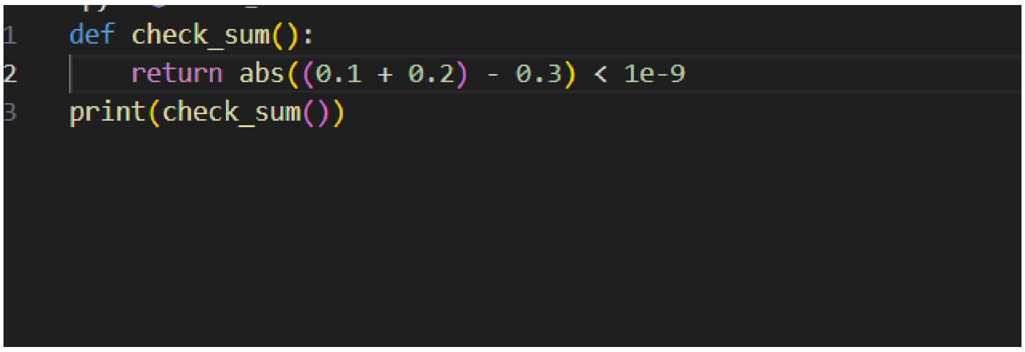
def check_sum():

return (0.1 + 0.2) == 0.3

print(check_sum())

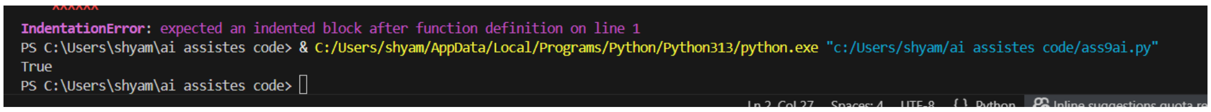
Expected Output: Corrected function

Code:



```python
def check_sum():
    return abs((0.1 + 0.2) - 0.3) < 1e-9
print(check_sum())
```

Output:



```
IndentationError: expected an indented block after function definition on line 1
PS C:\Users\shyam\ai assistes code> & C:/Users/shyam/AppData/Local/Programs/Python/Python313/python.exe "c:/Users/shyam/ai assistes code/ass9ai.py"
True
PS C:\Users\shyam\ai assistes code> 
```

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):

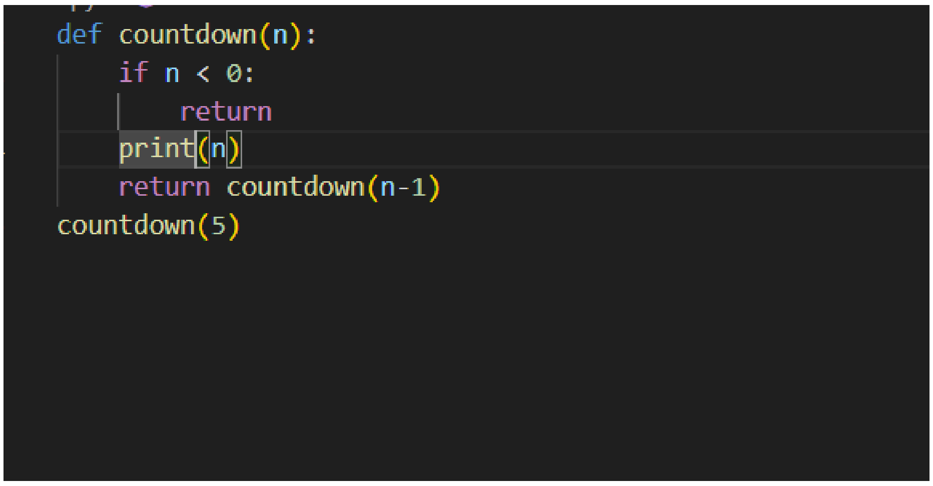
print(n)

return countdown(n-1)

countdown(5)

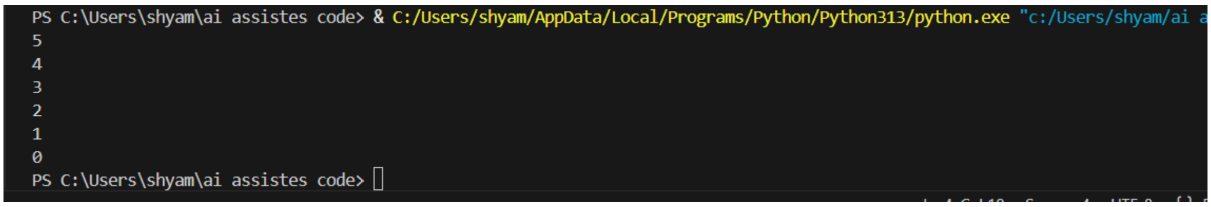
Expected Output : Correct recursion with stopping condition

Code:



```python
def countdown(n):
    if n < 0:
        return
    print(n)
    return countdown(n-1)
countdown(5)
```

Output:



```
PS C:\Users\shyam\ai assistes code> & C:/Users/shyam/AppData/Local/Programs/Python/Python313/python.exe "c:/Users/shyam/ai a
5
4
3
2
1
0
PS C:\Users\shyam\ai assistes code> 
```

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():

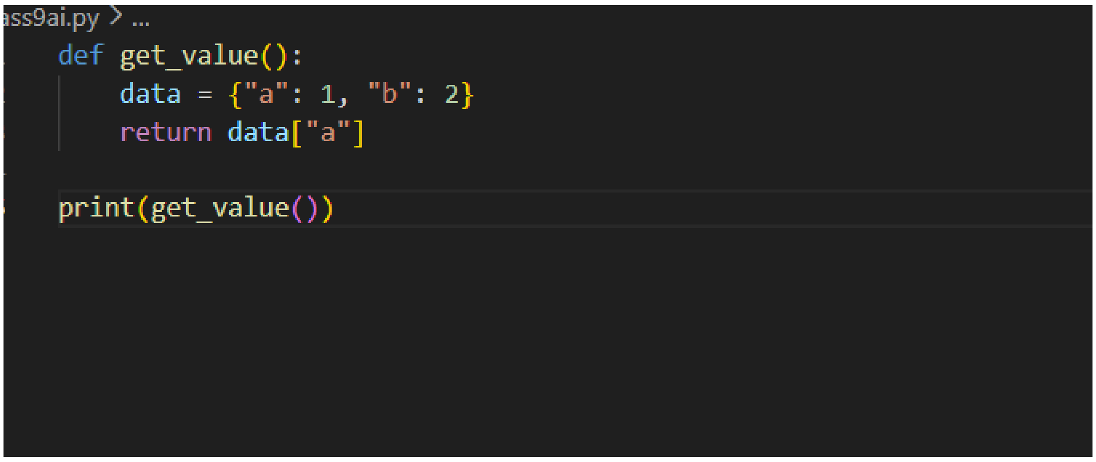
data = {"a": 1, "b": 2}

return data["c"]

print(get_value())

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

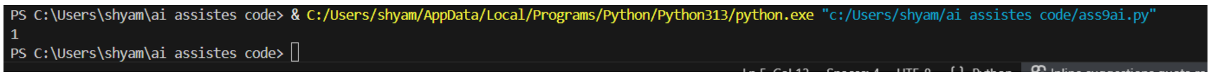
Code:



```python
ass9ai.py > ...
def get_value():
    data = {"a": 1, "b": 2}
    return data["a"]

print(get_value())
```

Output:



```
PS C:\Users\shyam\ai assistes code> & C:/Users/shyam/AppData/Local/Programs/Python/Python313/python.exe "c:/Users/shyam/ai assistes code/ass9ai.py"
1
PS C:\Users\shyam\ai assistes code> 
```

Task 5 (Infinite Loop – Wrong Condition)

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

and fix it.

# Bug: Infinite loop

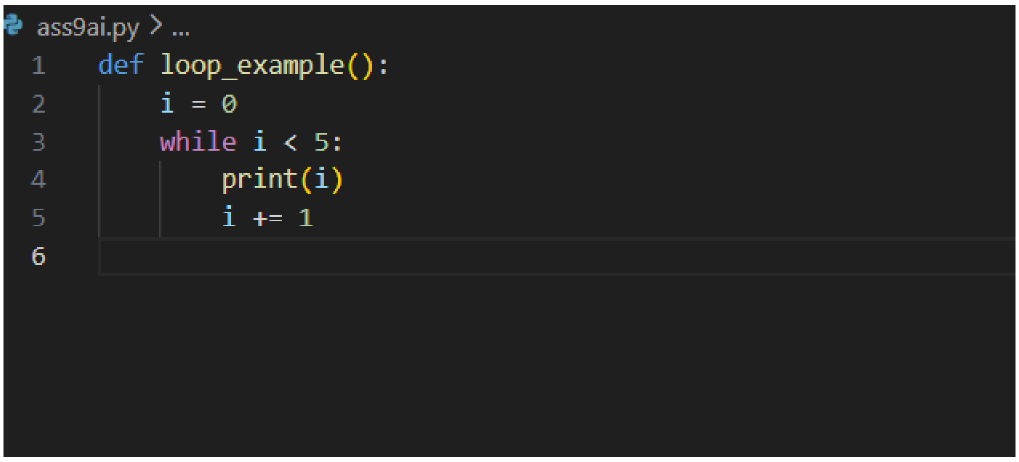
def loop_example():

i = 0

while i < 5:

print(i)

Expected Output: Corrected loop increments i.
Code:

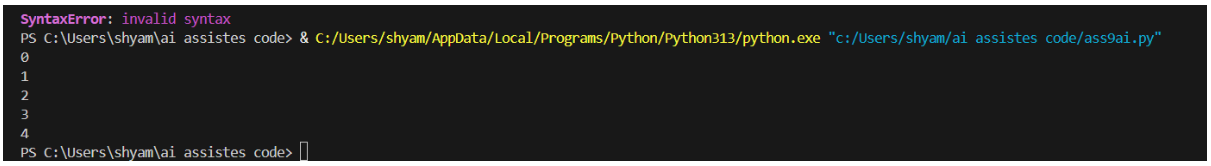


ass9ai.py > ...

```python
def loop_example():
    i = 0
    while i < 5:
        print(i)
        i += 1

```

Output:



```
SyntaxError: invalid syntax
PS C:\Users\shyam\ai assistes code> & C:/Users/shyam/AppData/Local/Programs/Python/Python313/python.exe "c:/Users/shyam/ai assistes code/ass9ai.py"
0
1
2
3
4
PS C:\Users\shyam\ai assistes code> 
```

Task 6 (Unpacking Error – Wrong Variables)

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

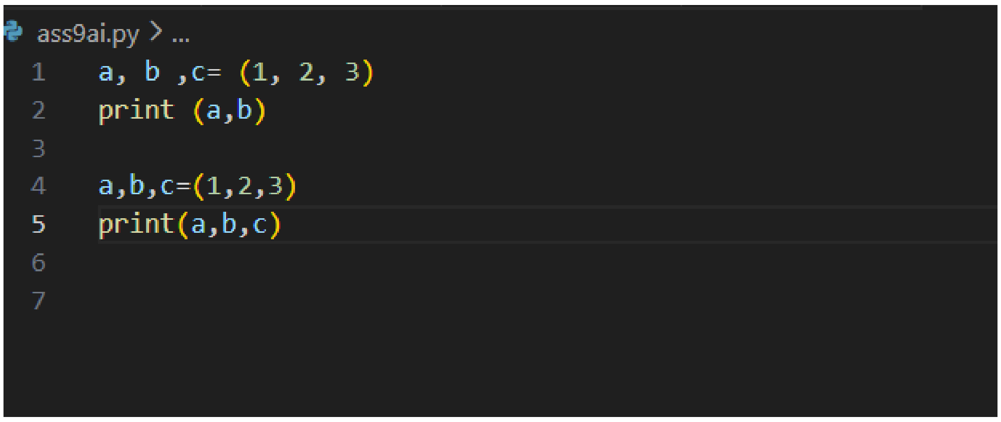
fix it.

# Bug: Wrong unpacking

a, b = (1, 2, 3)

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

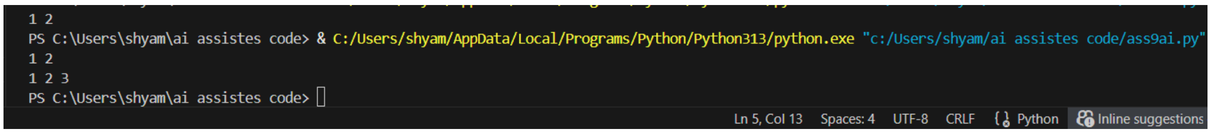
Code:



```
ass9ai.py > ...
a, b ,c= (1, 2, 3)
print (a,b)

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

Output:



```
1 2
PS C:\Users\shyam\ai assistes code> & C:/Users/shyam/AppData/Local/Programs/Python/Python313/python.exe "c:/Users/shyam/ai assistes code/ass9ai.py"
1 2
1 2 3
PS C:\Users\shyam\ai assistes code>
```

Ln 5, Col 13 Spaces: 4 UTF-8 CRLF { } Python Inline suggestions

Task 7 (Mixed Indentation – Tabs vs Spaces)

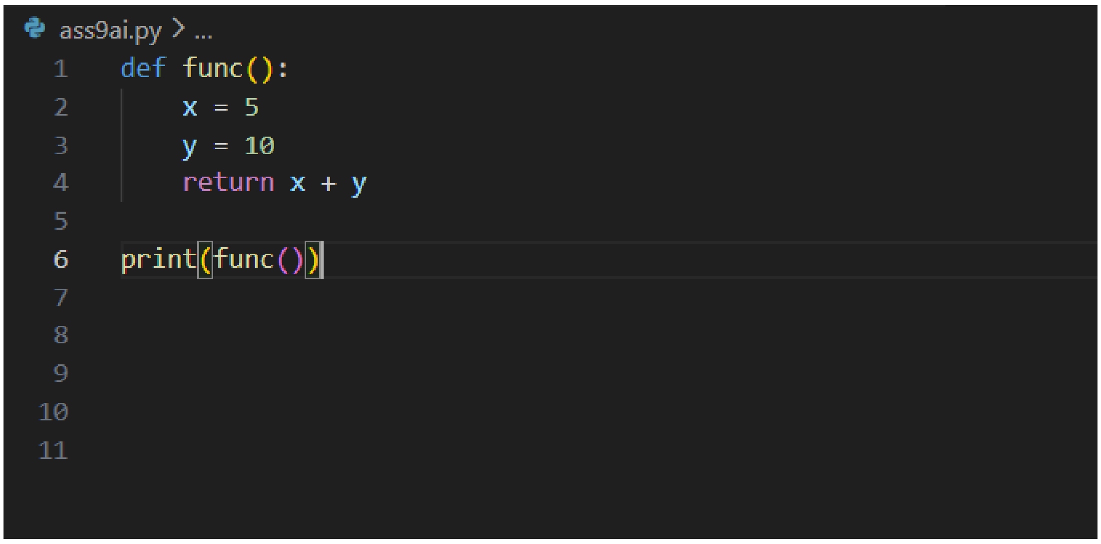
Task: Analyze given code where mixed indentation breaks

execution. Use AI to fix it.

# Bug: Mixed indentation

Expected Output : Consistent indentation applied.

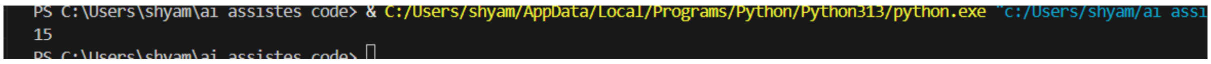
Code:



```
ass9ai.py > ...
def func():
    x = 5
    y = 10
    return x + y

print(func())
```

Output:



```
PS C:\Users\shyam\ai assistes code> & C:/Users/shyam/AppData/Local/Programs/Python/Python313/python.exe "c:/Users/shyam/ai assi
15
PS C:\Users\shyam\ai assistes code>
```

Task 8 (Import Error – Wrong Module Usage)

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

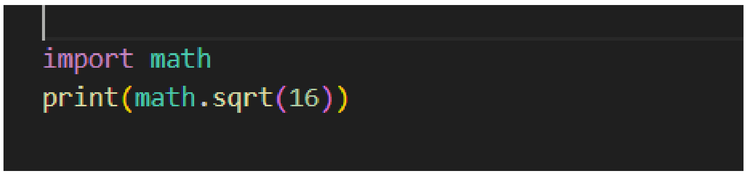
# Bug: Wrong import

import maths

print(maths.sqrt(16))

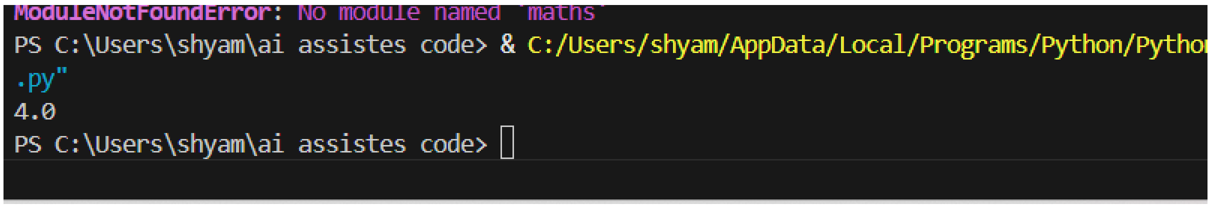
Expected Output: Corrected to import math

Code:



```python
import math
print(math.sqrt(16))
```

Output:



```
ModuleNotFoundError: No module named 'maths'
PS C:\Users\shyam\ai assistes code> & C:/Users/shyam/AppData/Local/Programs/Python/Pytho
.py"
4.0
PS C:\Users\shyam\ai assistes code>
```

Task 9 (Unreachable Code – Return Inside Loop)

Task: Analyze given code where a return inside a loop prevents full

iteration. Use AI to fix it.

# Bug: Early return inside loop

def total(numbers):

for n in numbers:

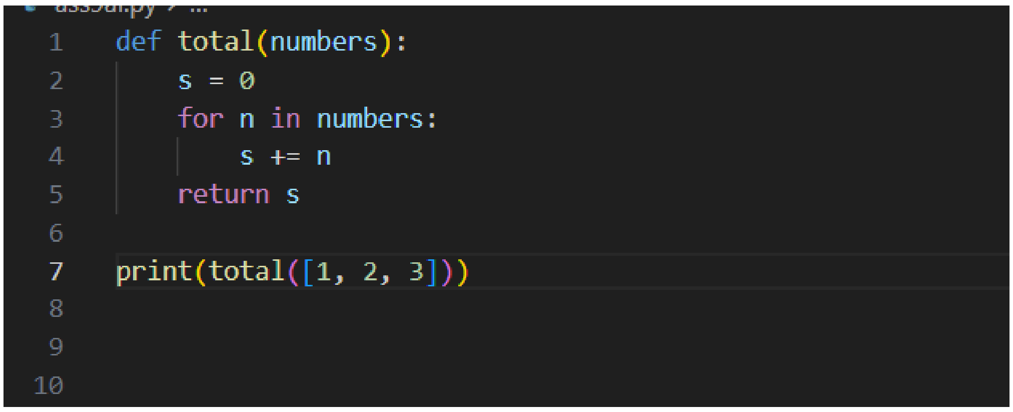
return n

print(total([1,2,3]))

Expected Output: Corrected code accumulates sum and returns

after loop

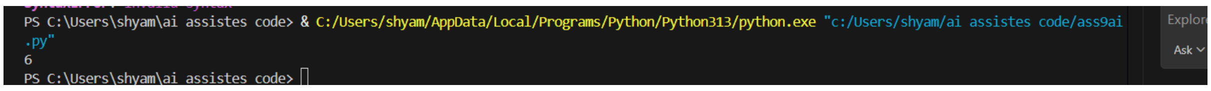
Output:



```python
def total(numbers):
    s = 0
    for n in numbers:
        s += n
    return s

print(total([1, 2, 3]))
```

Output:



```
PS C:\Users\shyam\ai assistes code> & C:/Users/shyam/AppData/Local/Programs/Python/Python313/python.exe "c:/Users/shyam/ai assistes code/ass9ai
.py"
6
PS C:\Users\shyam\ai assistes code>
```

Task 10 (Name Error – Undefined Variable)

Task: Analyze given code where a variable is used before being

defined. Let AI detect and fix the error.

# Bug: Using undefined variable

def calculate_area():

return length * width

print(calculate_area())

Requirements:

• Run the code to observe the error.

• Ask AI to identify the missing variable definition.

• Fix the bug by defining length and width as parameters.

• Add 3 assert test cases for correctness.

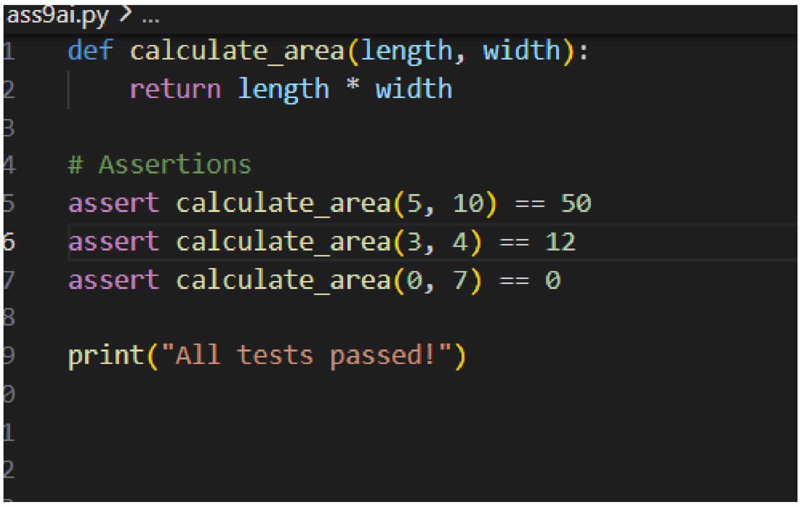
Expected Output :

• Corrected code with parameters.

• AI explanation of the bug.

Successful execution of assertions.

Code:



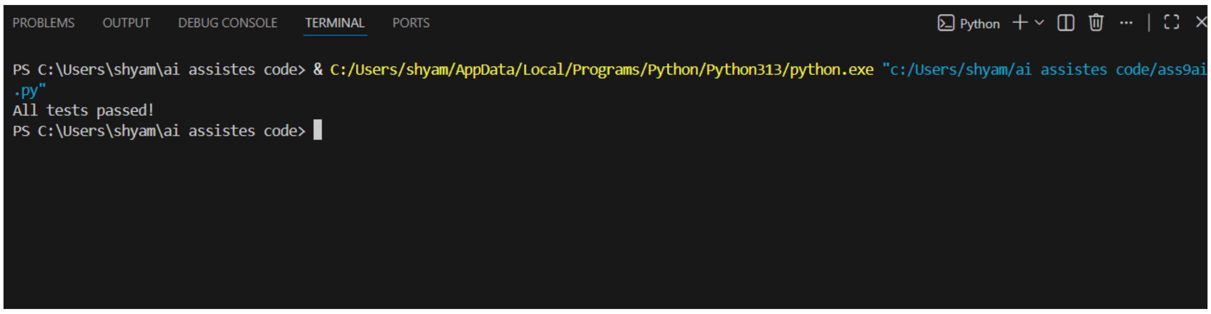
ass9ai.py > ...

```python
def calculate_area(length, width):
    return length * width

# Assertions
assert calculate_area(5, 10) == 50
assert calculate_area(3, 4) == 12
assert calculate_area(0, 7) == 0

print("All tests passed!")
```

Output:



```
PS C:\Users\shyam\ai assistes code> & C:/Users/shyam/AppData/Local/Programs/Python/Python313/python.exe "c:/Users/shyam/ai assistes code/ass9ai
.py"
All tests passed!
PS C:\Users\shyam\ai assistes code> 
```

Task 11 (Type Error – Mixing Data Types Incorrectly)

Task: Analyze given code where integers and strings are added

incorrectly. Let AI detect and fix the error.

# Bug: Adding integer and string

def add_values():

return 5 + "10"

print(add_values())

Requirements:

• Run the code to observe the error.

• AI should explain why int + str is invalid.

• Fix the code by type conversion (e.g., int("10") or str(5)).

• Verify with 3 assert cases.

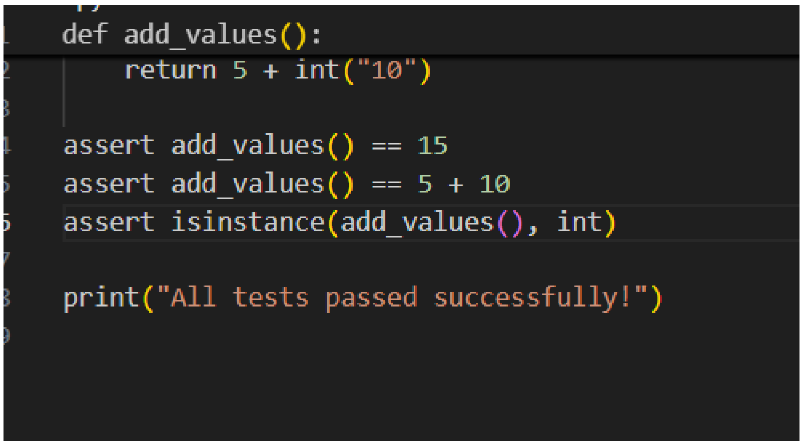
Expected Output #6:

• Corrected code with type handling.

• AI explanation of the fix.

Successful test validation.

Code:

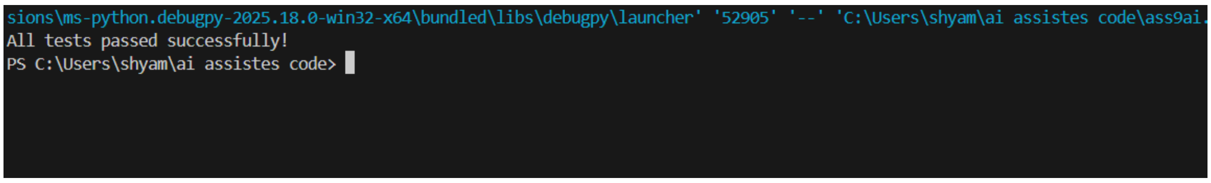


```python
def add_values():
    return 5 + int("10")

assert add_values() == 15
assert add_values() == 5 + 10
assert isinstance(add_values(), int)

print("All tests passed successfully!")
```

Output:



```
sions\ms-python.debugpy-2025.18.0-win32-x64\bundled\libs\debugpy\launcher' '52905' '--' 'C:\Users\shyam\ai assistes code\ass9ai.
All tests passed successfully!
PS C:\Users\shyam\ai assistes code>
```

Task 12 (Type Error – String + List Concatenation)

Task: Analyze code where a string is incorrectly added to a list.

# Bug: Adding string and list

def combine():

return "Numbers: " + [1, 2, 3]

print(combine())

Requirements:

• Run the code to observe the error.

• Explain why str + list is invalid.

• Fix using conversion (str([1,2,3]) or " ".join()).

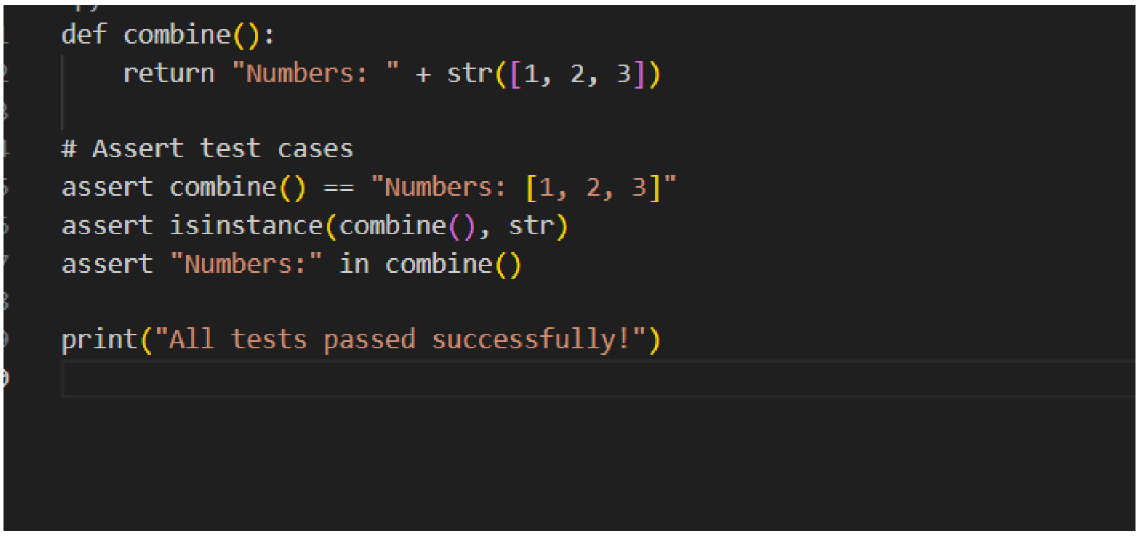
• Verify with 3 assert cases.

Expected Output:

• Corrected code

• Explanation

• Successful test validation

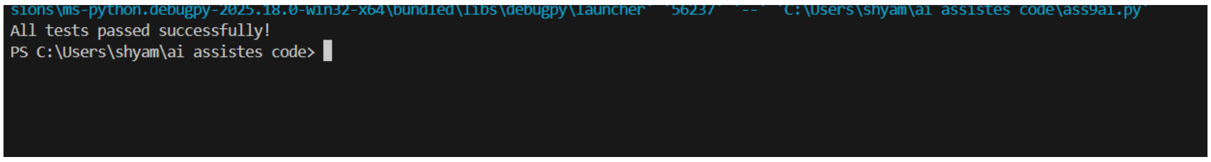


```python
def combine():
    return "Numbers: " + str([1, 2, 3])

# Assert test cases
assert combine() == "Numbers: [1, 2, 3]"
assert isinstance(combine(), str)
assert "Numbers:" in combine()

print("All tests passed successfully!")
```

Output:



```
sions\ms-python.debugpy-2025.18.0-win32-x64\bundled\libs\debugpy\launcher' '56237' '--' 'C:\Users\shyam\ai assistes code\ass9ai.py'
All tests passed successfully!
PS C:\Users\shyam\ai assistes code> 
```

Task 13 (Type Error – Multiplying String by Float)

Task: Detect and fix code where a string is multiplied by a float.

# Bug: Multiplying string by float

def repeat_text():

return "Hello" * 2.5

print(repeat_text())

Requirements:

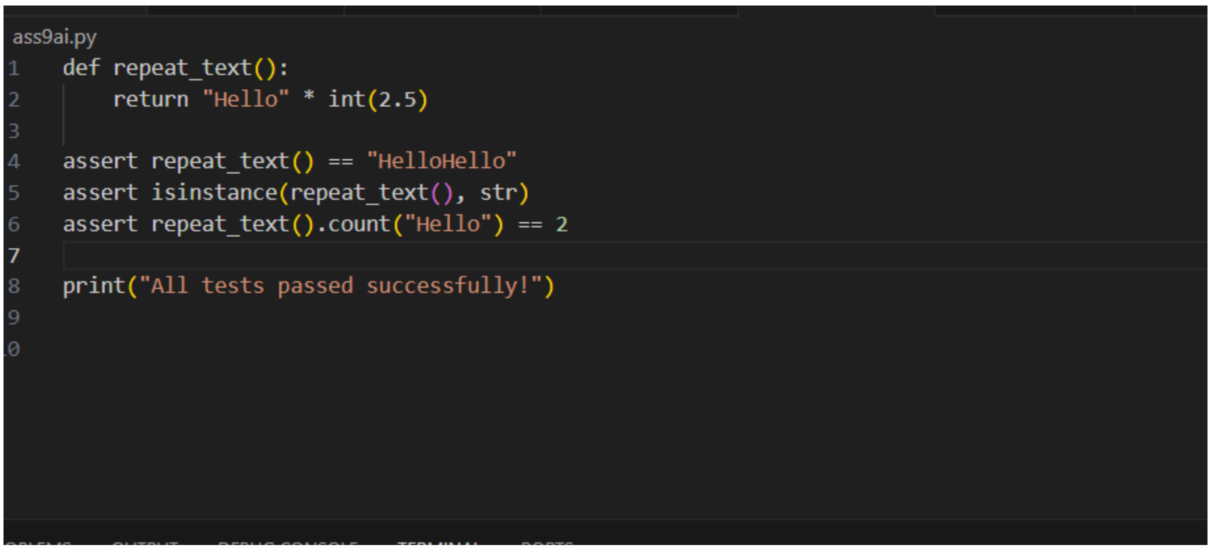
• Observe the error.

• Explain why float multiplication is invalid for strings.

• Fix by converting float to int.

• Add 3 assert test cases.

Code:

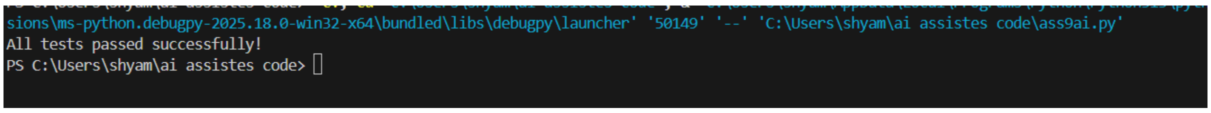


```
ass9ai.py
def repeat_text():
    return "Hello" * int(2.5)

assert repeat_text() == "HelloHello"
assert isinstance(repeat_text(), str)
assert repeat_text().count("Hello") == 2

print("All tests passed successfully!")
```

Output:



```
sions\ms-python.debugpy-2025.18.0-win32-x64\bundled\libs\debugpy\launcher' '50149' '--' 'C:\Users\shyam\ai assistes code\ass9ai.py'
All tests passed successfully!
PS C:\Users\shyam\ai assistes code> 
```

Task 14 (Type Error – Adding None to Integer)

Task: Analyze code where None is added to an integer.

# Bug: Adding None and integer

def compute():

value = None

return value + 10

print(compute())

Requirements:

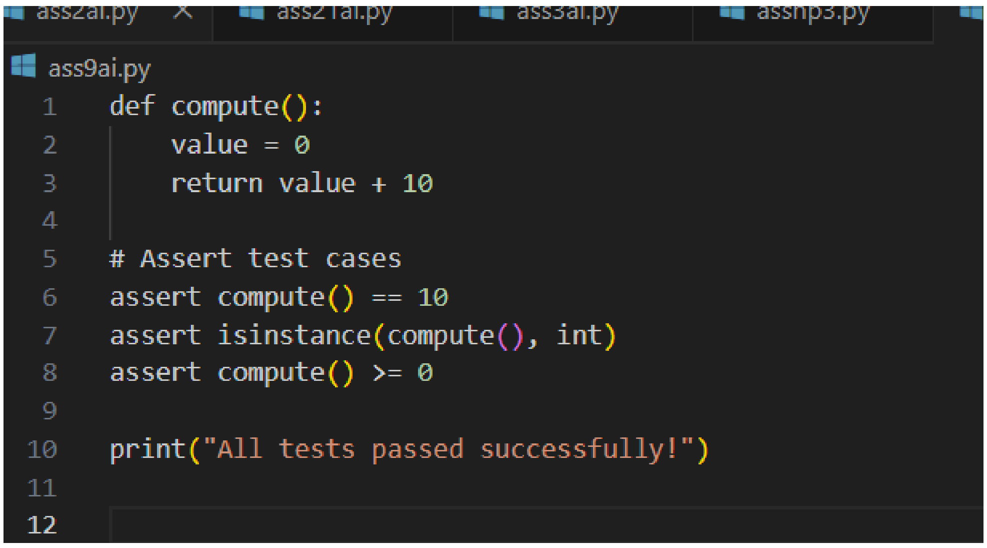
• Run and identify the error.

• Explain why NoneType cannot be added.

• Fix by assigning a default value.

• Validate using assert

Code:

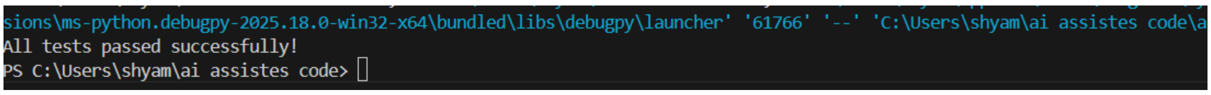


```
ass2ai.py   ass21ai.py   ass3ai.py   assnp3.py
ass9ai.py
def compute():
    value = 0
    return value + 10

# Assert test cases
assert compute() == 10
assert isinstance(compute(), int)
assert compute() >= 0

print("All tests passed successfully!")
```

Output:



```
sions\ms-python.debugpy-2025.18.0-win32-x64\bundled\libs\debugpy\launcher' '61766' '--' 'C:\Users\shyam\ai assistes code\a
All tests passed successfully!
PS C:\Users\shyam\ai assistes code>
```

Task 15 (Type Error – Input Treated as String Instead of Number)

Task: Fix code where user input is not converted properly.

# Bug: Input remains string

def sum_two_numbers():

a = input("Enter first number: ")

b = input("Enter second number: ")

return a + b

print(sum_two_numbers())

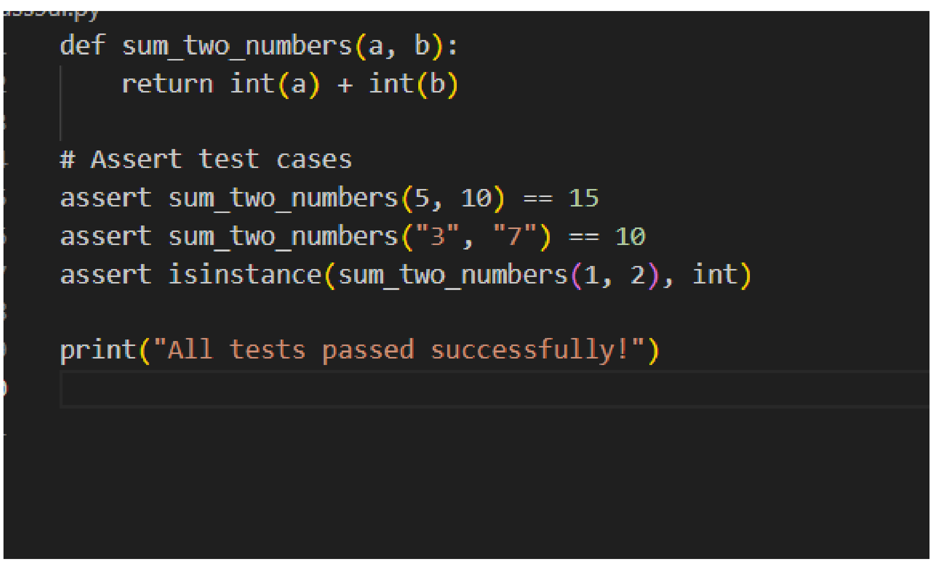
Requirements:

• Explain why input is always string.

• Fix using int() conversion.

• Verify with assert test cases.

Code:

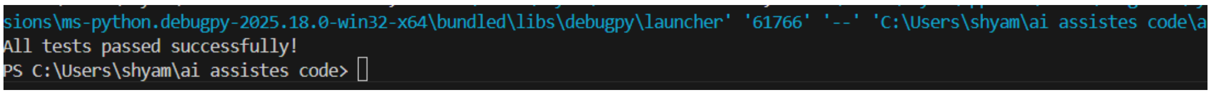


```python
def sum_two_numbers(a, b):
    return int(a) + int(b)

# Assert test cases
assert sum_two_numbers(5, 10) == 15
assert sum_two_numbers("3", "7") == 10
assert isinstance(sum_two_numbers(1, 2), int)

print("All tests passed successfully!")
```

OutPut:



```
sions\ms-python.debugpy-2025.18.0-win32-x64\bundled\libs\debugpy\launcher' '61766' '--' 'C:\Users\shyam\ai assistes code\a
All tests passed successfully!
PS C:\Users\shyam\ai assistes code> 
```