AI Assisted Coding

Assignment 7.5

Name: **D.Akash**

Ht.no: **2303A51422**

Batch: **21**

Lab 7: Error Debugging with AI: Systematic approaches to finding and fixing bugs

Lab Objectives:

• To identify and correct syntax, logic, and runtime errors in Python programs using AI tools.

• To understand common programming bugs and AI-assisted debugging suggestions.

• To evaluate how AI explains, detects, and fixes different types of coding errors.

• To build confidence in using AI to perform structured debugging practices.

Lab Outcomes (LOs):

After completing this lab, students will be able to:

• Use AI tools to detect and correct syntax, logic, and runtime errors.

• Interpret AI-suggested bug fixes and explanations.

• Apply systematic debugging strategies supported by AI-generated insights.

Task 1 (Mutable Default Argument – Function Bug)

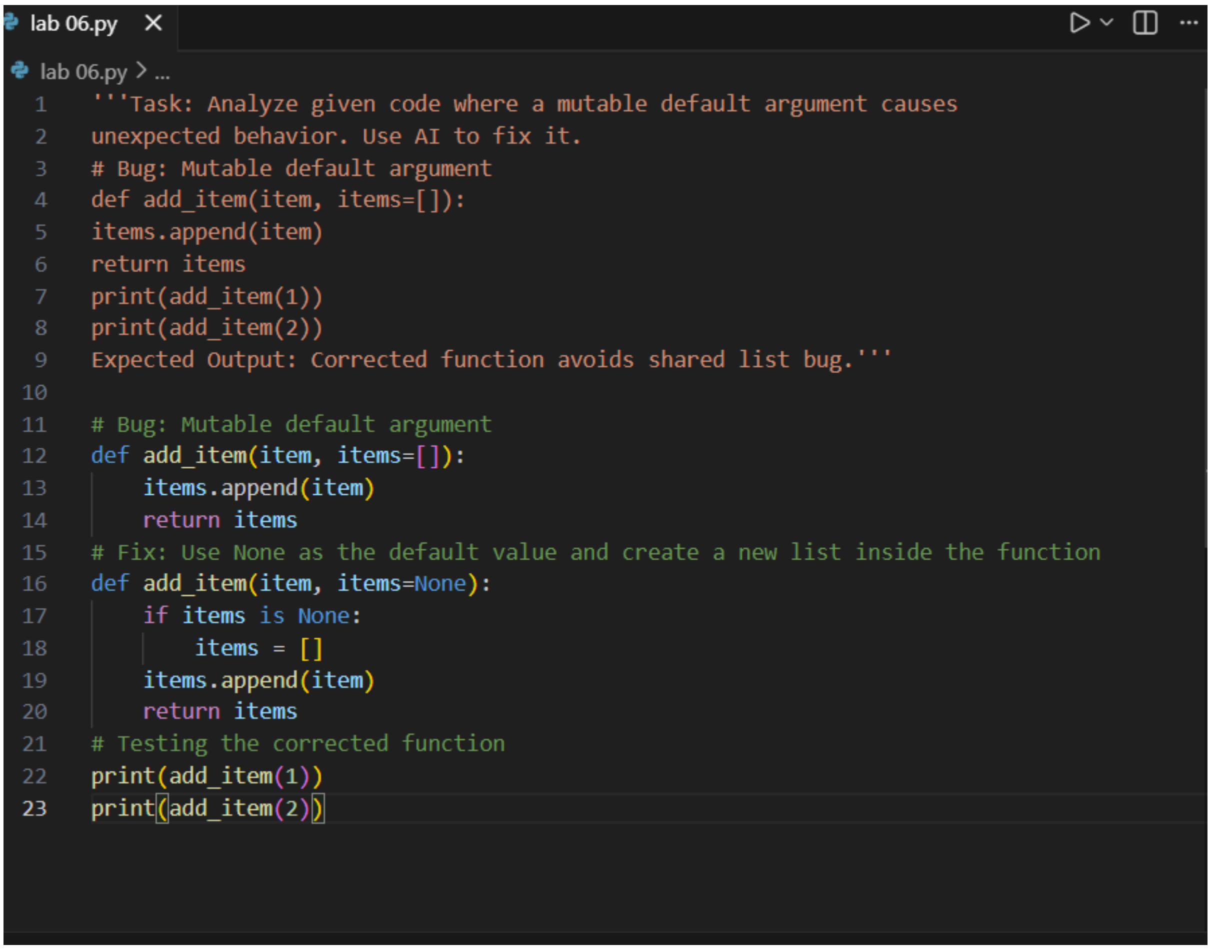
Task: Analyze given code where a mutable default argument cause

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.

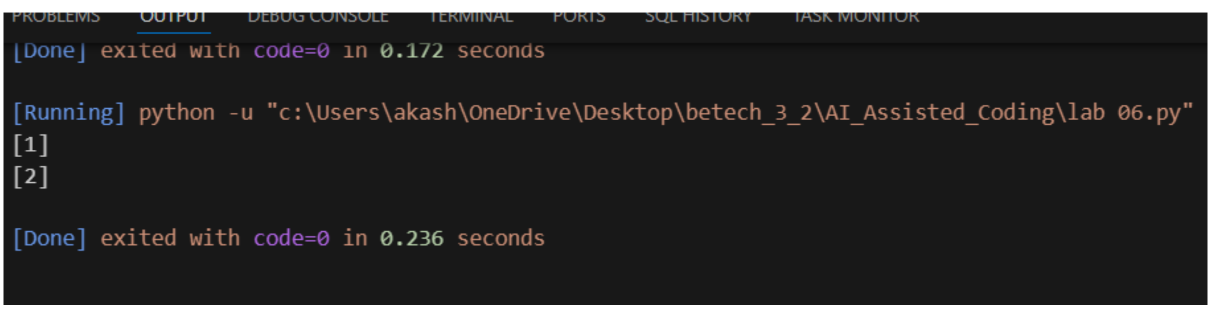
Code:



```
'''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.'''

# Bug: Mutable default argument
def add_item(item, items=[]):
    items.append(item)
    return items
# Fix: Use None as the default value and create a new list inside the function
def add_item(item, items=None):
    if items is None:
        items = []
    items.append(item)
    return items
# Testing the corrected function
print(add_item(1))
print(add_item(2))
```

Output:



```
[Done] exited with code=0 in 0.172 seconds

[Running] python -u "c:\Users\akash\OneDrive\Desktop\betech_3_2\AI_Assisted_Coding\lab 06.py"
[1]
[2]

[Done] exited with code=0 in 0.236 seconds
```

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

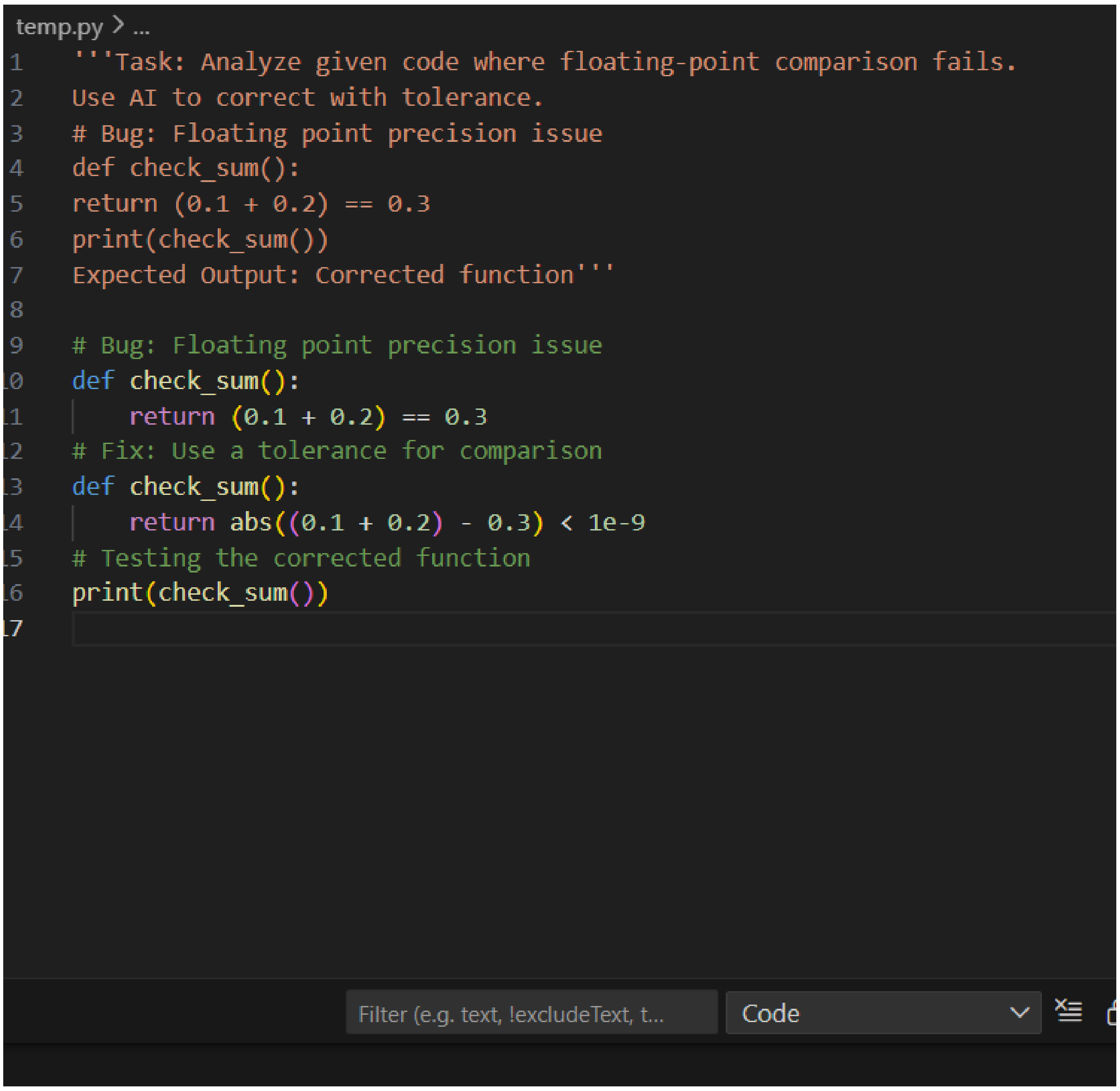
def check_sum():

return (0.1 + 0.2) == 0.3

print(check_sum())

Expected Output: Corrected function

Code:

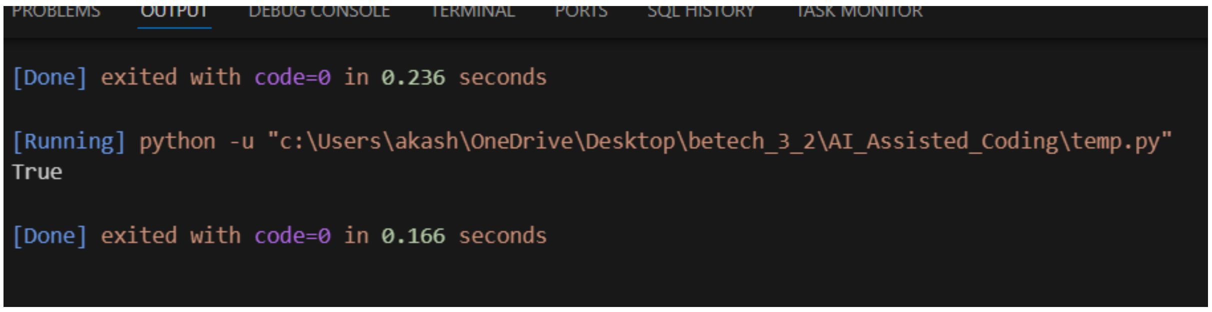


temp.py > ...

```
'''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'''

# Bug: Floating point precision issue
def check_sum():
    return (0.1 + 0.2) == 0.3
# Fix: Use a tolerance for comparison
def check_sum():
    return abs((0.1 + 0.2) - 0.3) < 1e-9
# Testing the corrected function
print(check_sum())
```

Output:



```
[Done] exited with code=0 in 0.236 seconds

[Running] python -u "c:\Users\akash\OneDrive\Desktop\betech_3_2\AI_Assisted_Coding\temp.py"
True

[Done] exited with code=0 in 0.166 seconds
```

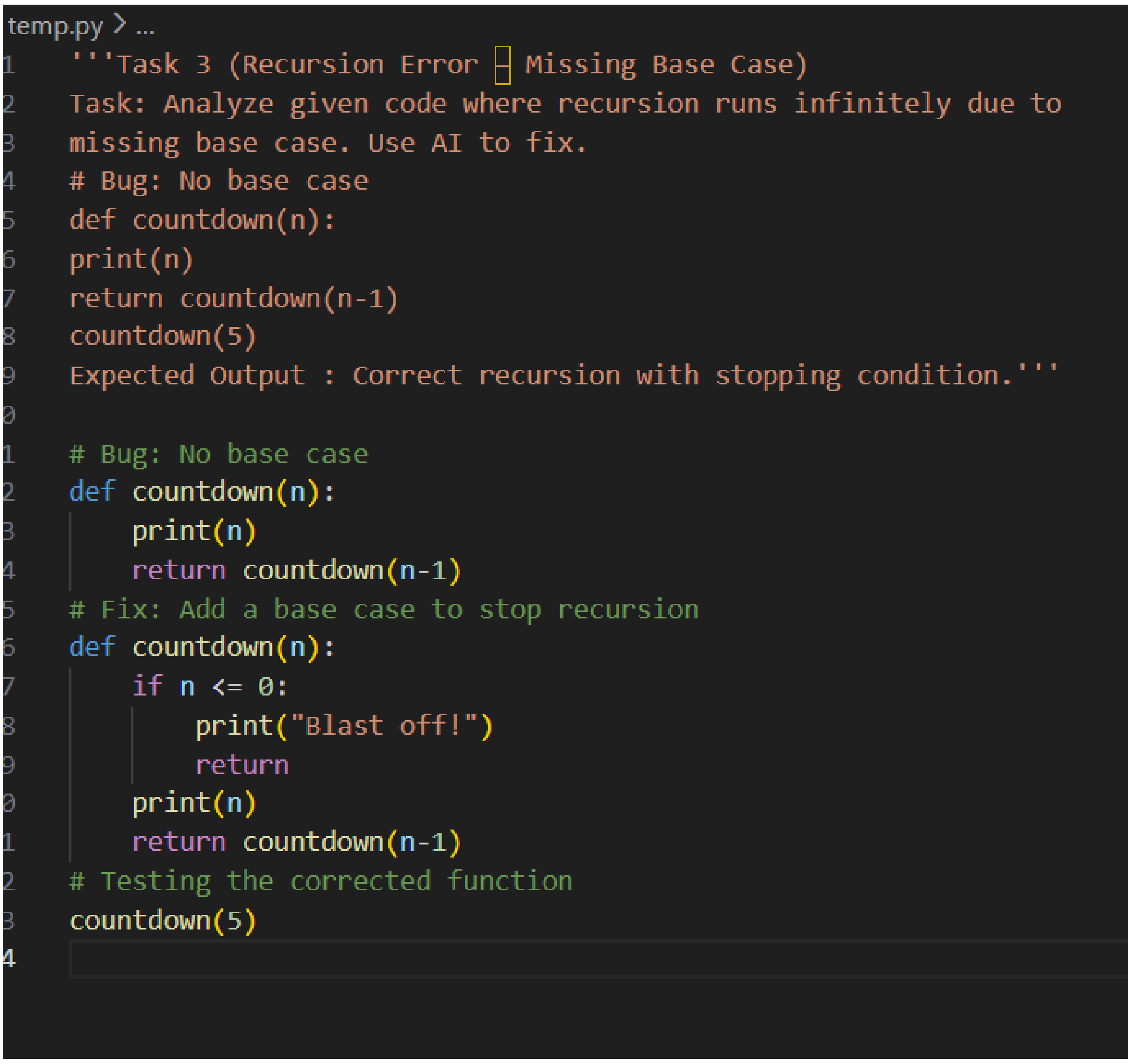
Task 3 (Recursion Error – Missing Base Case)

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:

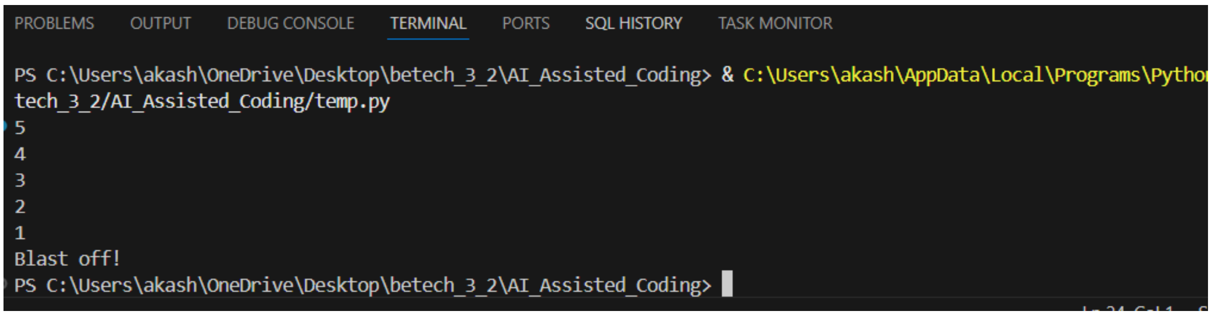


```
temp.py > ...
'''Task 3 (Recursion Error – Missing Base Case)
Task: Analyze given code where recursion runs infinitely due to
missing base case. Use AI to fix.
# Bug: No base case
def countdown(n):
print(n)
return countdown(n-1)
countdown(5)
Expected Output : Correct recursion with stopping condition.'''

# Bug: No base case
def countdown(n):
    print(n)
    return countdown(n-1)
# Fix: Add a base case to stop recursion
def countdown(n):
    if n <= 0:
        print("Blast off!")
        return
    print(n)
    return countdown(n-1)
# Testing the corrected function
countdown(5)

```

Output:



```
PS C:\Users\akash\OneDrive\Desktop\betech_3_2\AI_Assisted_Coding> & C:\Users\akash\AppData\Local\Programs\Pytho
tech_3_2/AI_Assisted_Coding/temp.py
5
4
3
2
1
Blast off!
PS C:\Users\akash\OneDrive\Desktop\betech_3_2\AI_Assisted_Coding> 
```

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():

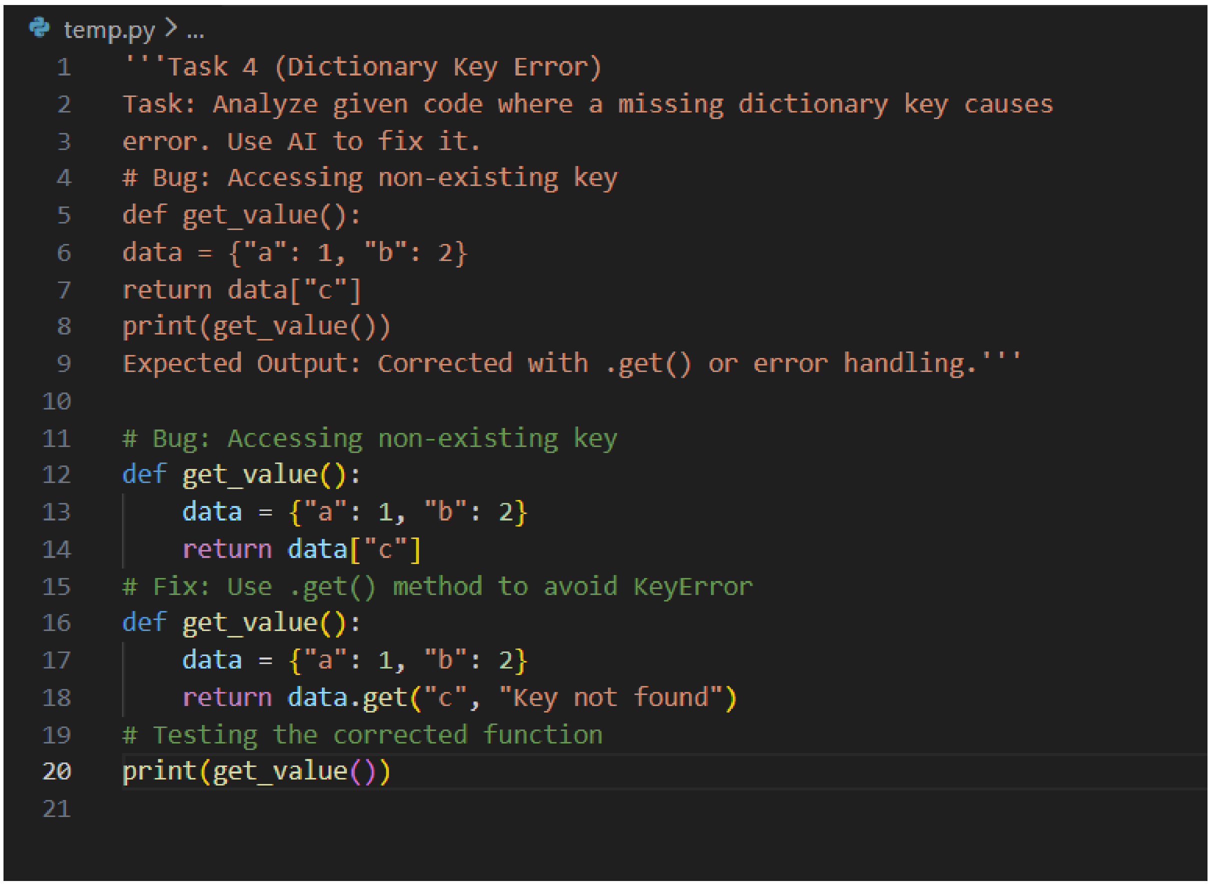
data = {"a": 1, "b": 2}

return data["c"]

print(get_value())

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

Code:

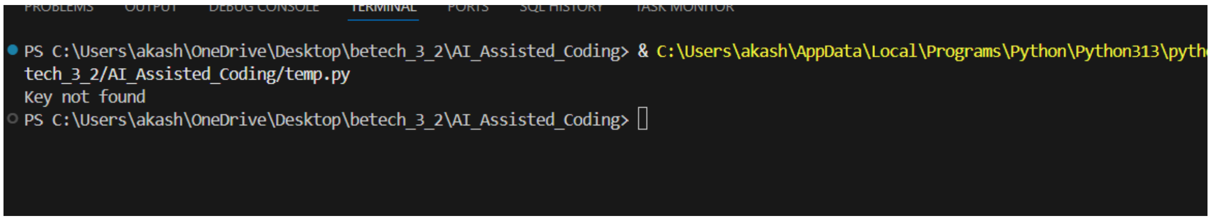


temp.py > ...

```python
'''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.'''

# Bug: Accessing non-existing key
def get_value():
    data = {"a": 1, "b": 2}
    return data["c"]
# Fix: Use .get() method to avoid KeyError
def get_value():
    data = {"a": 1, "b": 2}
    return data.get("c", "Key not found")
# Testing the corrected function
print(get_value())
```

Output:



```
PS C:\Users\akash\OneDrive\Desktop\betech_3_2\AI_Assisted_Coding> & C:\Users\akash\AppData\Local\Programs\Python\Python313\pyth
tech_3_2/AI_Assisted_Coding/temp.py
Key not found
PS C:\Users\akash\OneDrive\Desktop\betech_3_2\AI_Assisted_Coding> 
```

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():

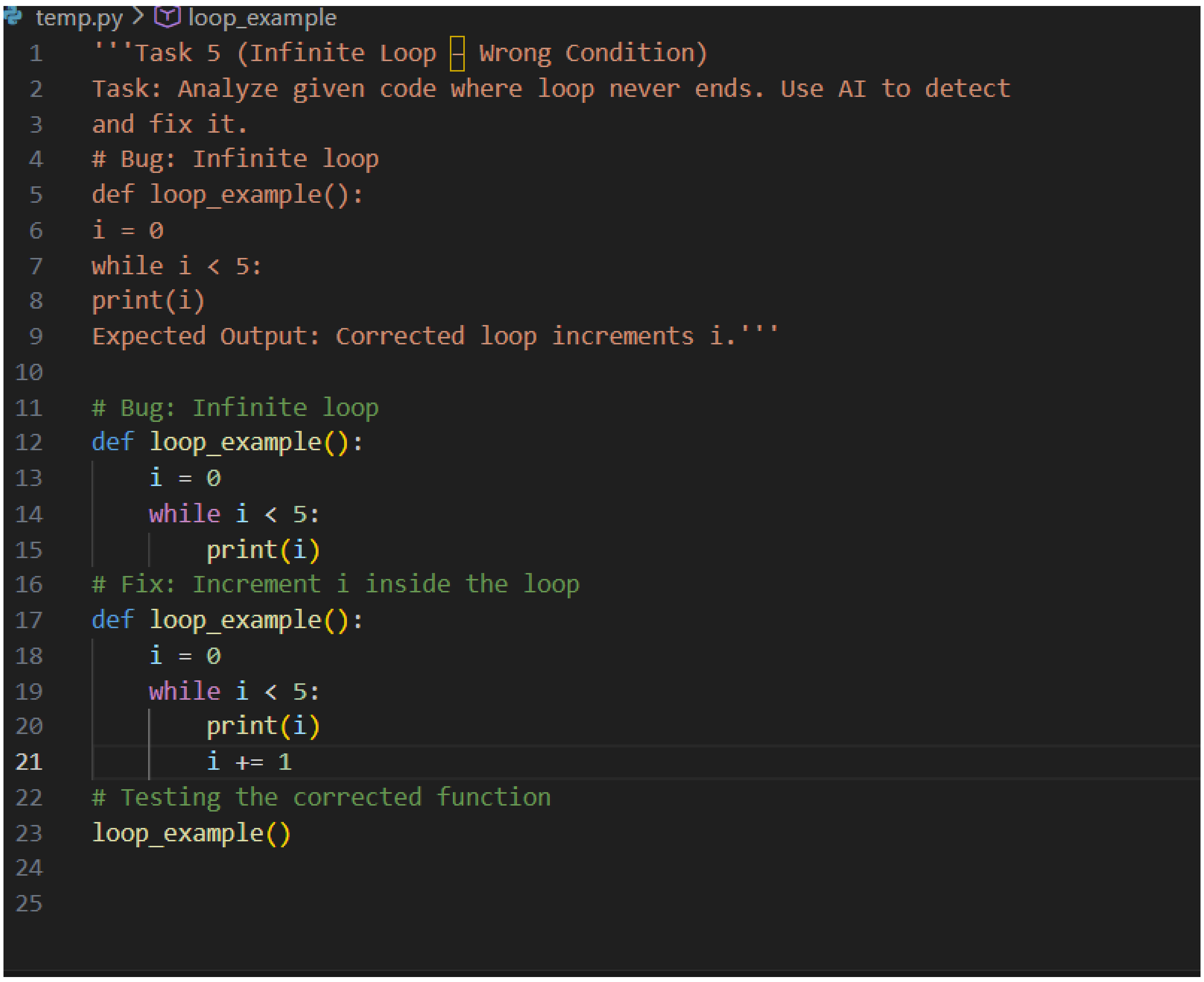
i = 0

while i < 5:

print(i)

Expected Output: Corrected loop increments i.

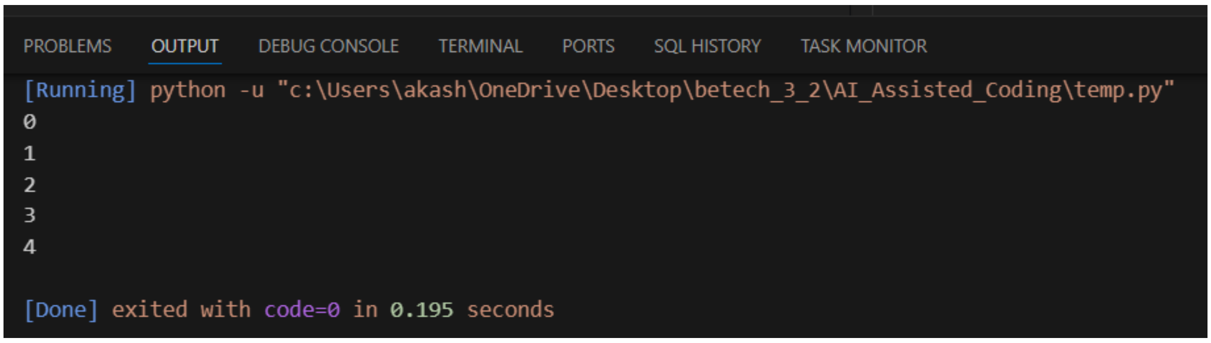
Code:



```
temp.py > loop_example
'''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.'''

# Bug: Infinite loop
def loop_example():
    i = 0
    while i < 5:
        print(i)
# Fix: Increment i inside the loop
def loop_example():
    i = 0
    while i < 5:
        print(i)
        i += 1
# Testing the corrected function
loop_example()
```

Output:



```
[Running] python -u "c:\Users\akash\OneDrive\Desktop\betech_3_2\AI_Assisted_Coding\temp.py"
0
1
2
3
4

[Done] exited with code=0 in 0.195 seconds
```

Task 6 (Unpacking Error – Wrong Variables)

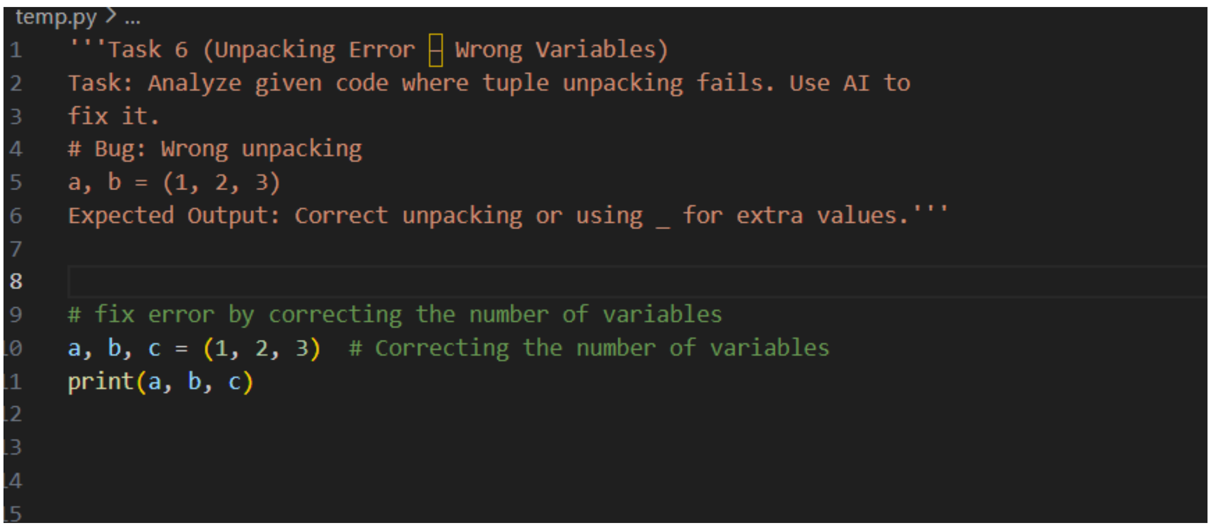
Task: Analyze given code where tuple unpacking fails. Use AI to fix it.

Bug: Wrong unpacking

a, b = (1, 2, 3)

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

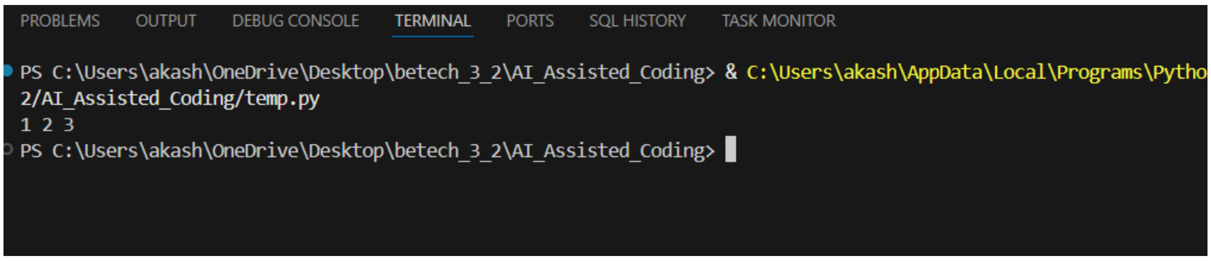
Code:



```
temp.py > ...
'''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.'''


# fix error by correcting the number of variables
a, b, c = (1, 2, 3)  # Correcting the number of variables
print(a, b, c)
```

Output:



```
PS C:\Users\akash\OneDrive\Desktop\betech_3_2\AI_Assisted_Coding> & C:\Users\akash\AppData\Local\Programs\Pytho
2/AI_Assisted_Coding/temp.py
1 2 3
PS C:\Users\akash\OneDrive\Desktop\betech_3_2\AI_Assisted_Coding>
```

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():

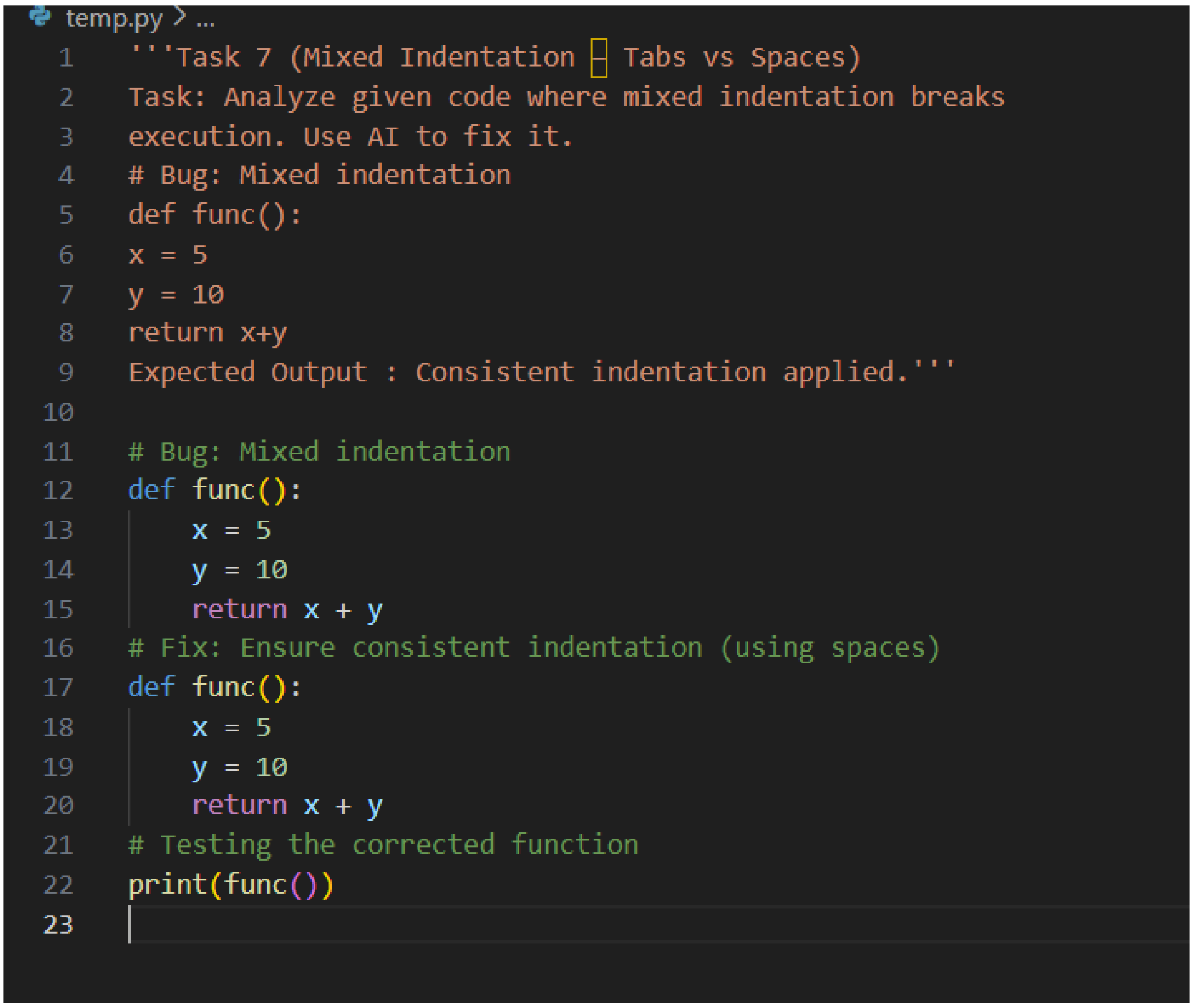
x = 5

y = 10

return x+y

Expected Output : Consistent indentation applied.

Code:



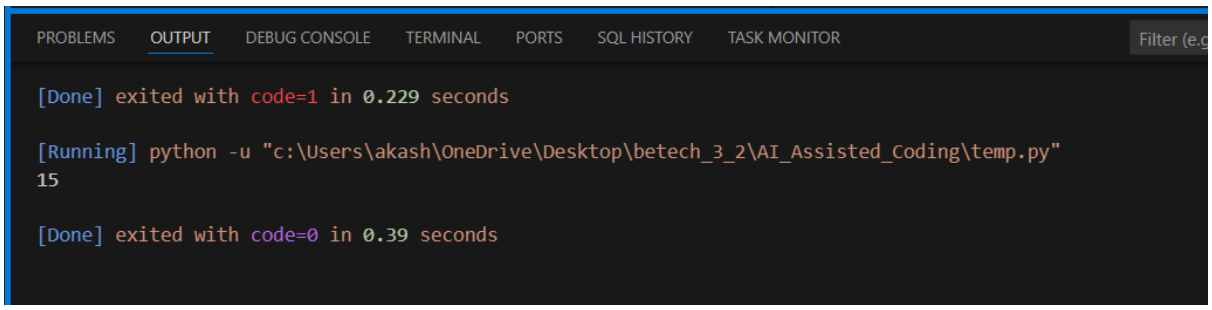
temp.py > ...

```python
'''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.'''

# Bug: Mixed indentation
def func():
    x = 5
    y = 10
    return x + y
# Fix: Ensure consistent indentation (using spaces)
def func():
    x = 5
    y = 10
    return x + y
# Testing the corrected function
print(func())

```

Output:


PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS SQL HISTORY TASK MONITOR

```
[Done] exited with code=1 in 0.229 seconds

[Running] python -u "c:\Users\akash\OneDrive\Desktop\betech_3_2\AI_Assisted_Coding\temp.py"
15

[Done] exited with code=0 in 0.39 seconds
```

Task 8 (Import Error – Wrong Module Usage)

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

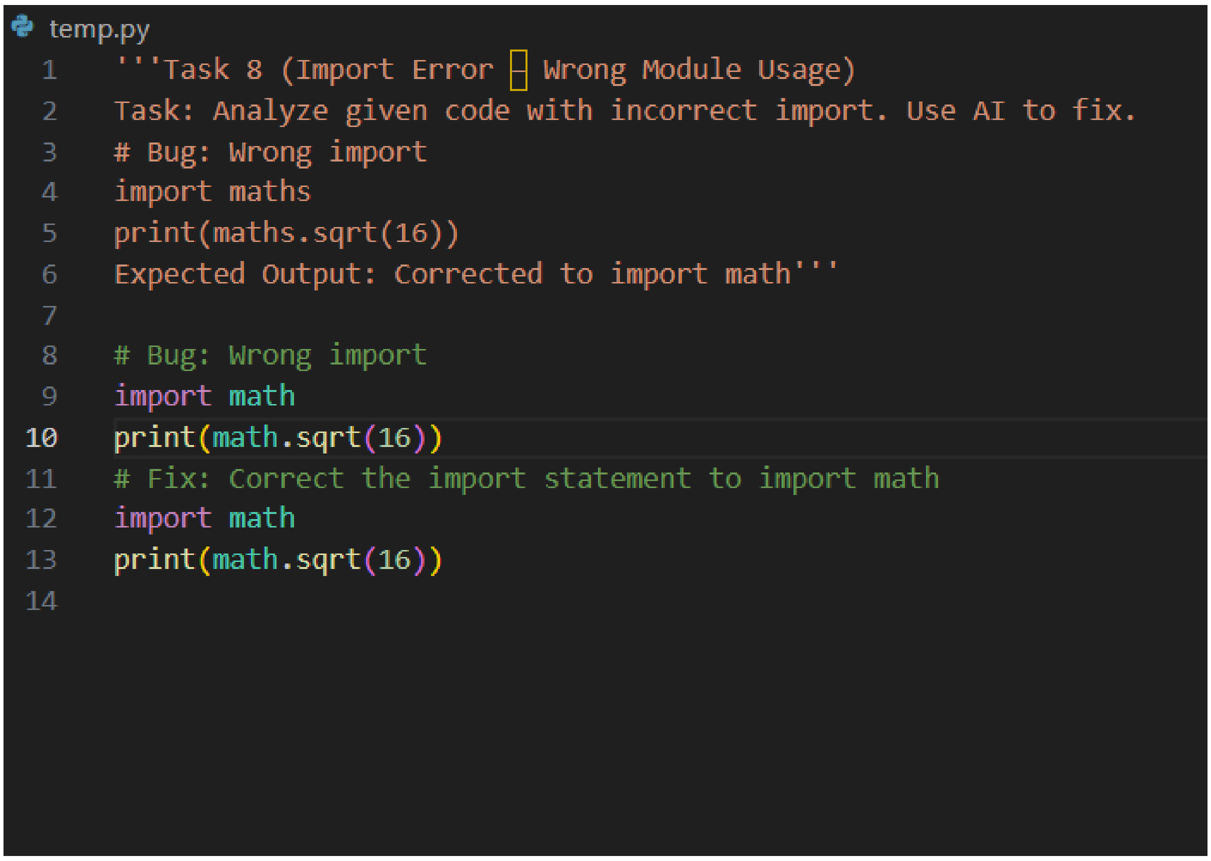
# Bug: Wrong import

import maths

print(maths.sqrt(16))

Expected Output: Corrected to import math

Code:

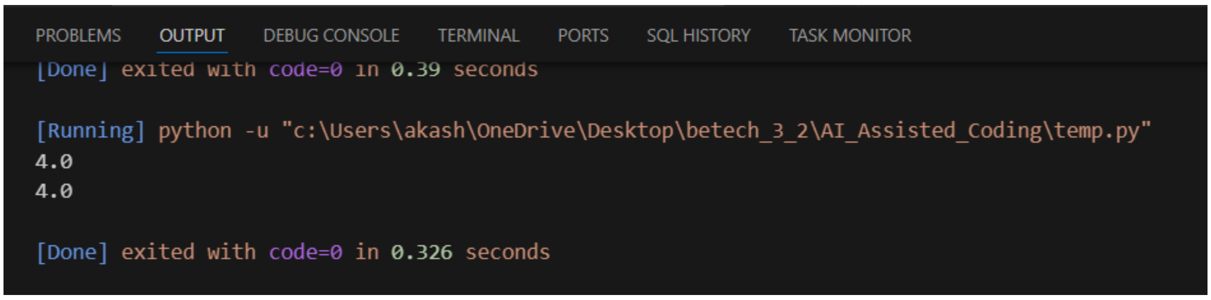


temp.py

```python
'''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'''

# Bug: Wrong import
import math
print(math.sqrt(16))
# Fix: Correct the import statement to import math
import math
print(math.sqrt(16))
```

Output:



```
[Done] exited with code=0 in 0.39 seconds

[Running] python -u "c:\Users\akash\OneDrive\Desktop\betech_3_2\AI_Assisted_Coding\temp.py"
4.0
4.0

[Done] exited with code=0 in 0.326 seconds
```