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Batch : 02

Course : AI ASSISTED CODING

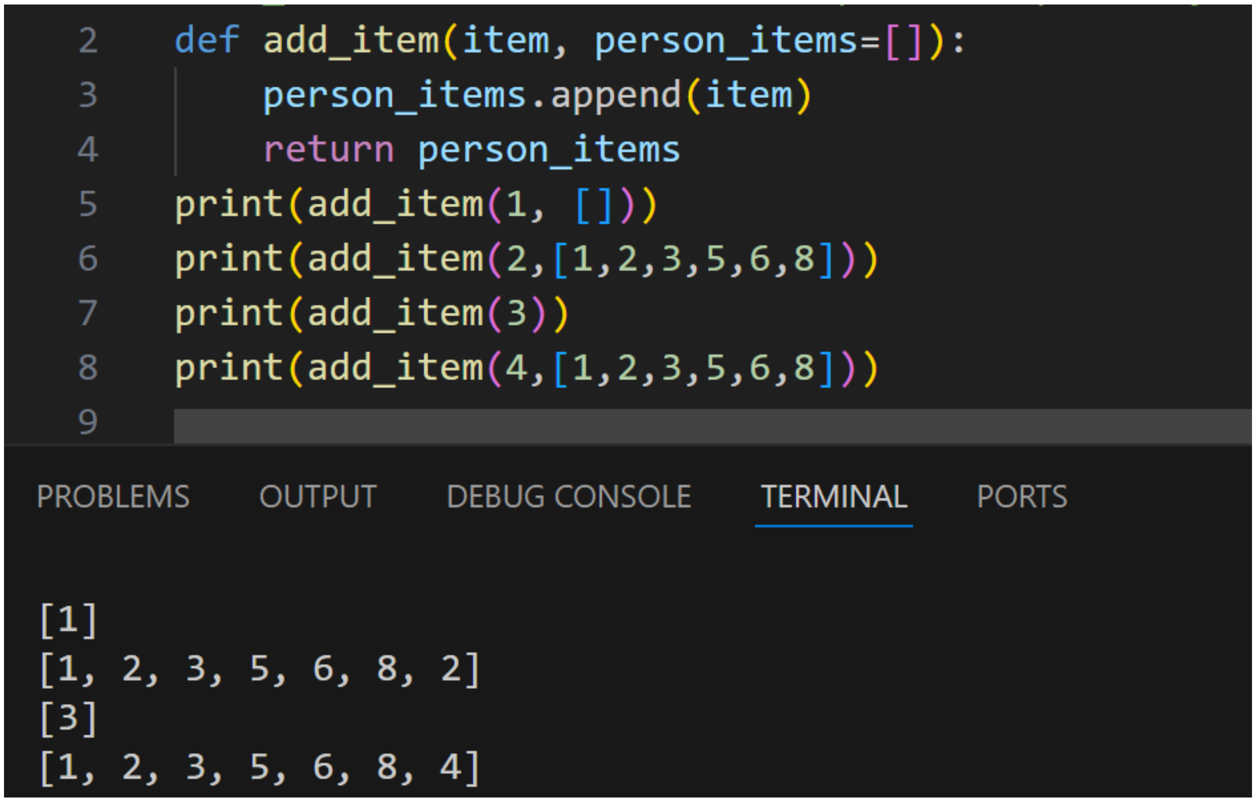
Task 1 (Mutable Default Argument – Function Bug)

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:



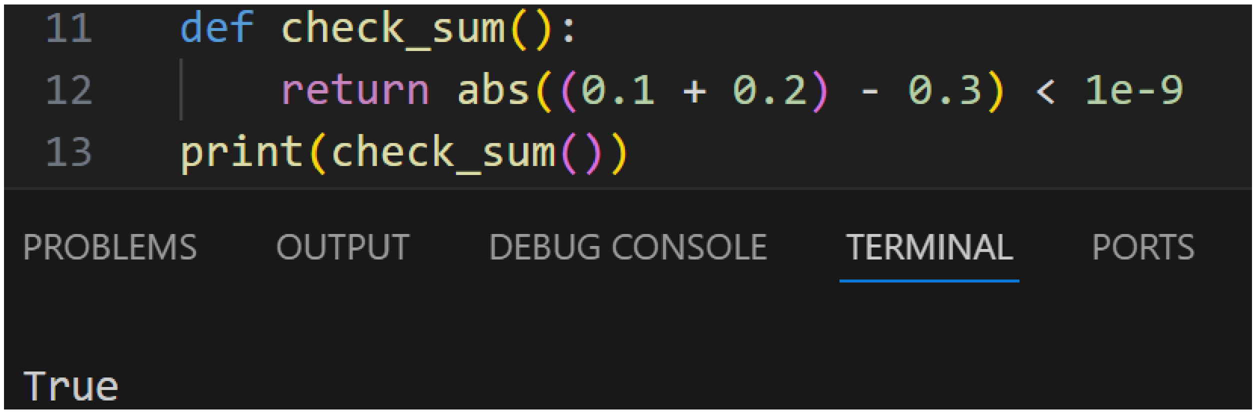
```
def add_item(item, person_items=[]):
    person_items.append(item)
    return person_items
print(add_item(1, []))
print(add_item(2,[1,2,3,5,6,8]))
print(add_item(3))
print(add_item(4,[1,2,3,5,6,8]))
```

```
[1]
[1, 2, 3, 5, 6, 8, 2]
[3]
[1, 2, 3, 5, 6, 8, 4]
```

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:

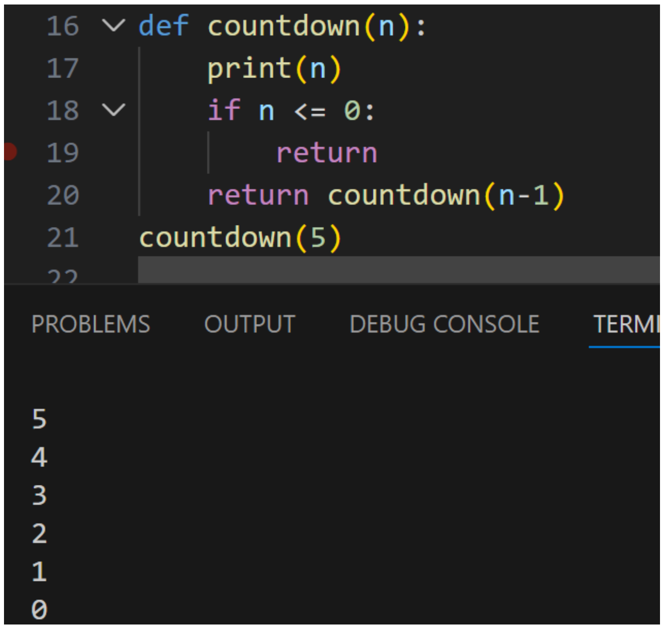


```
def check_sum():
    return abs((0.1 + 0.2) - 0.3) < 1e-9
print(check_sum())
```

```
True
```

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**.**

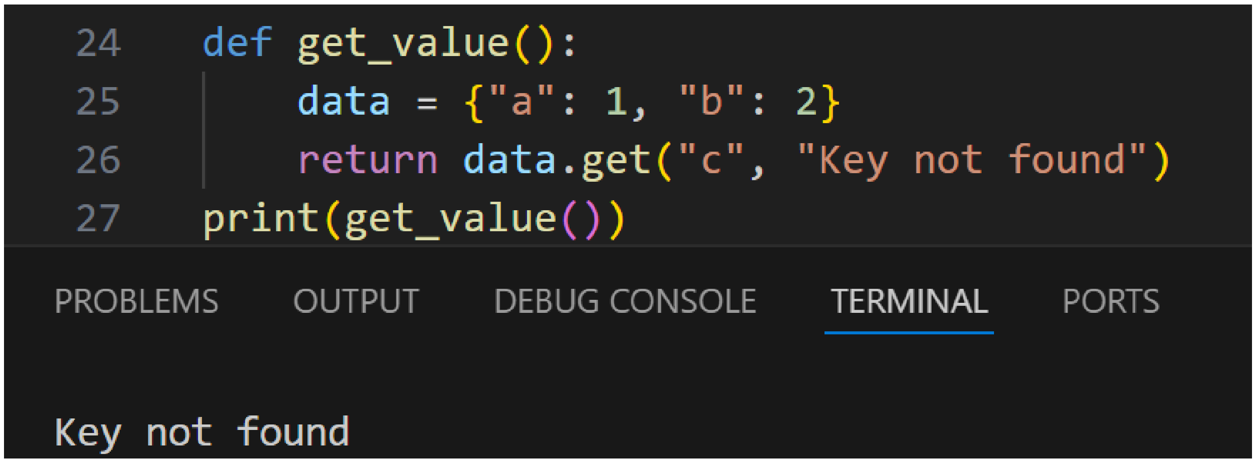
Code:


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

```
5
4
3
2
1
0
```

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:

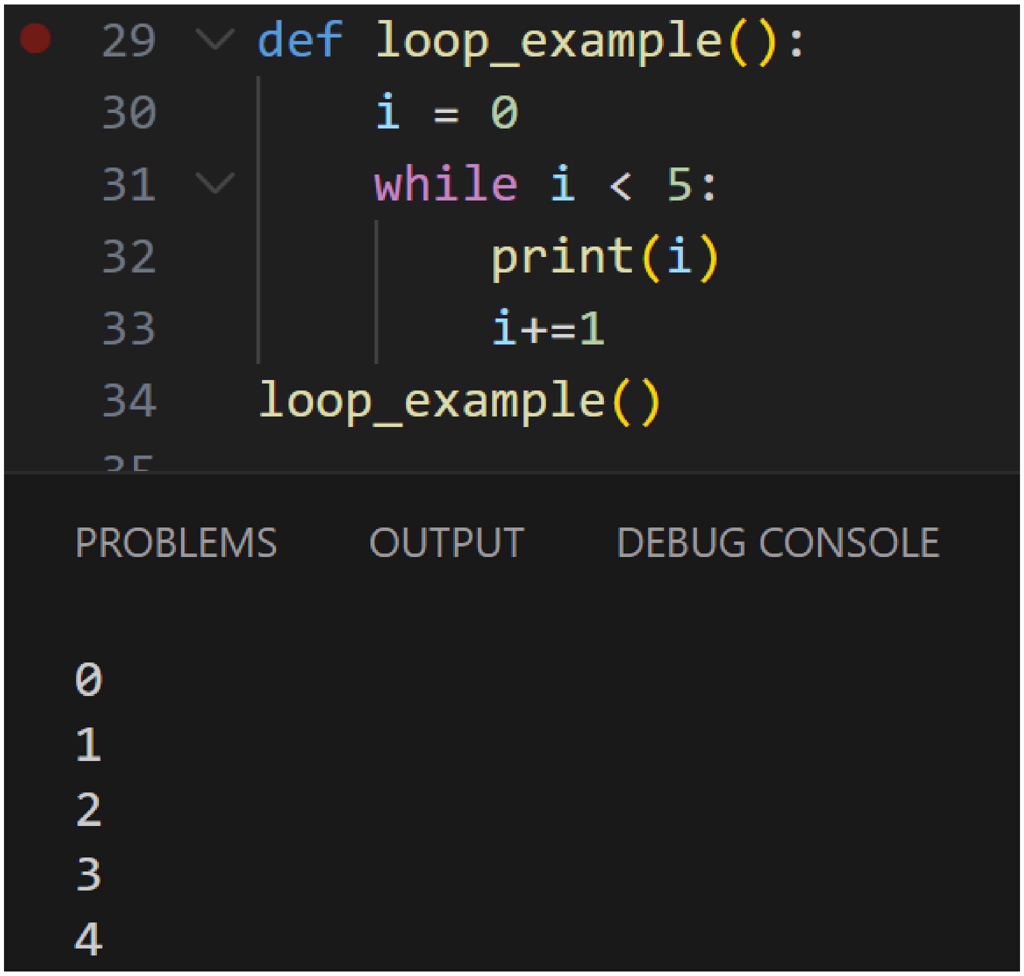

```python
def get_value():
    data = {"a": 1, "b": 2}
    return data.get("c", "Key not found")
print(get_value())
```

```
Key not found
```

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:

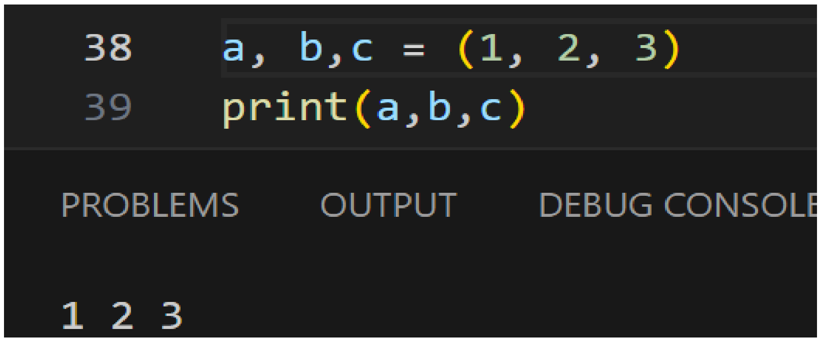


```python
def loop_example():
    i = 0
    while i < 5:
        print(i)
        i+=1
loop_example()
```

```
0
1
2
3
4
```

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:



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

PROBLEMS OUTPUT DEBUG CONSOLE

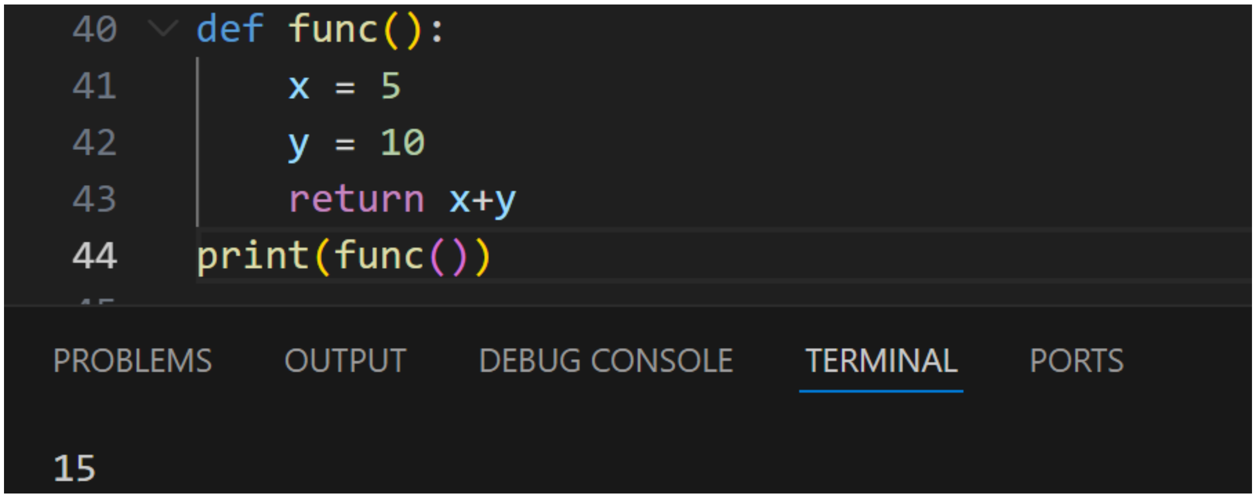
```
1 2 3
```

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:



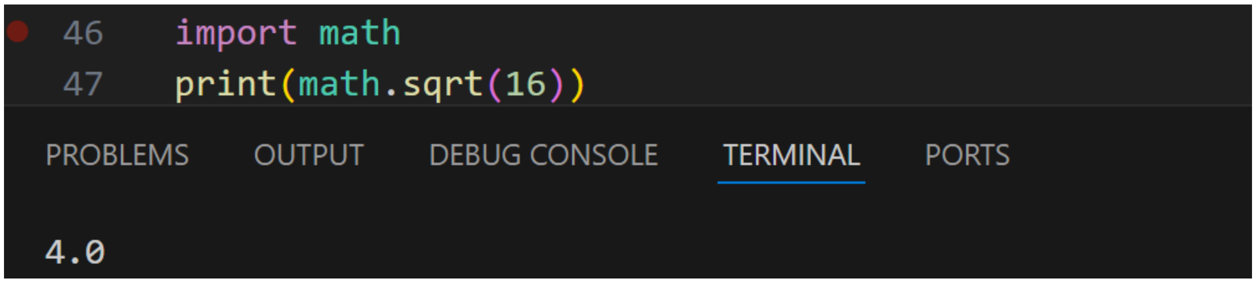
```
def func():
    x = 5
    y = 10
    return x+y
print(func())
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

```
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:



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

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

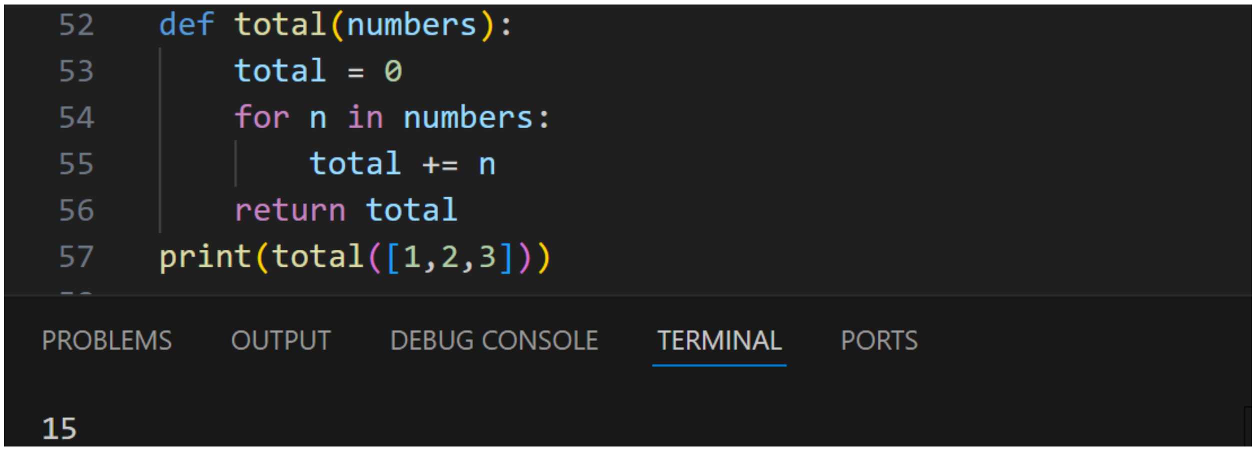
```
4.0
```

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.

Code:



```
def total(numbers):
    total = 0
    for n in numbers:
        total += n
    return total
print(total([1,2,3]))
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

```
15
```

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.

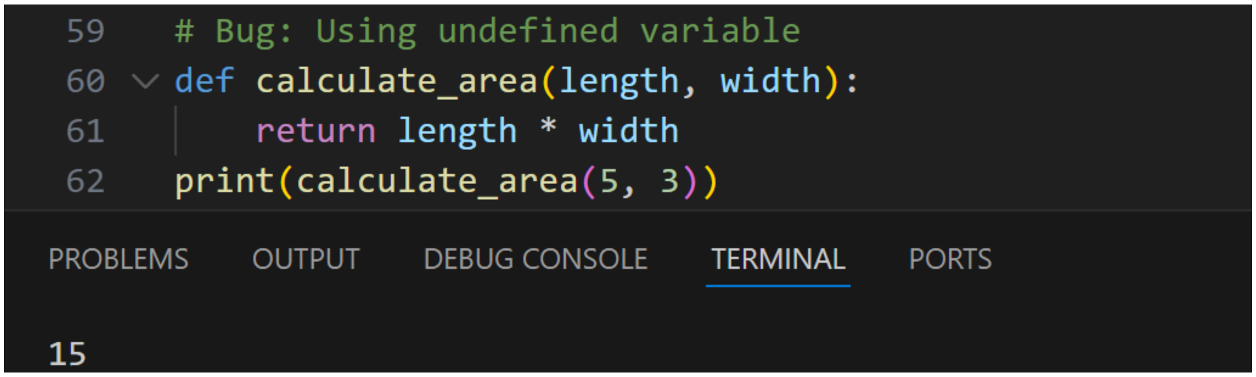
Expected Output :

- Corrected code with parameters.

- AI explanation of the bug.

Successful execution of assertions

Code:



```
# Bug: Using undefined variable
def calculate_area(length, width):
    return length * width
print(calculate_area(5, 3))
```

```
15
```

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:

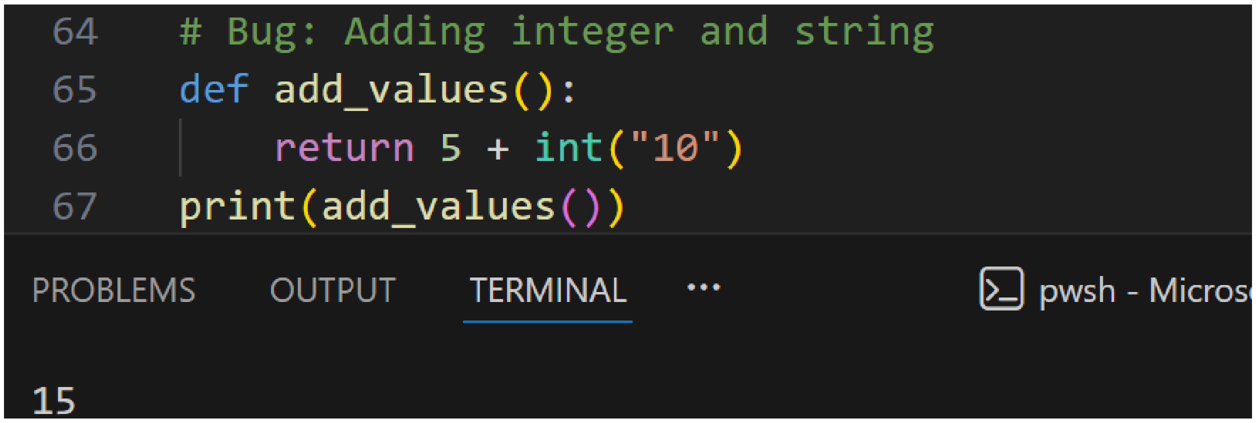
- Run the code to observe the error.
- AI should explain why int + str is invalid.
- Fix the code by type conversion (e.g., int("10") or str(5)).
- Verify with 3 assert cases.

Expected Output #6:

- Corrected code with type handling.
- AI explanation of the fix.

Successful test validation.

Code:



```
# Bug: Adding integer and string
def add_values():
    return 5 + int("10")
print(add_values())
```

```
15
```

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())

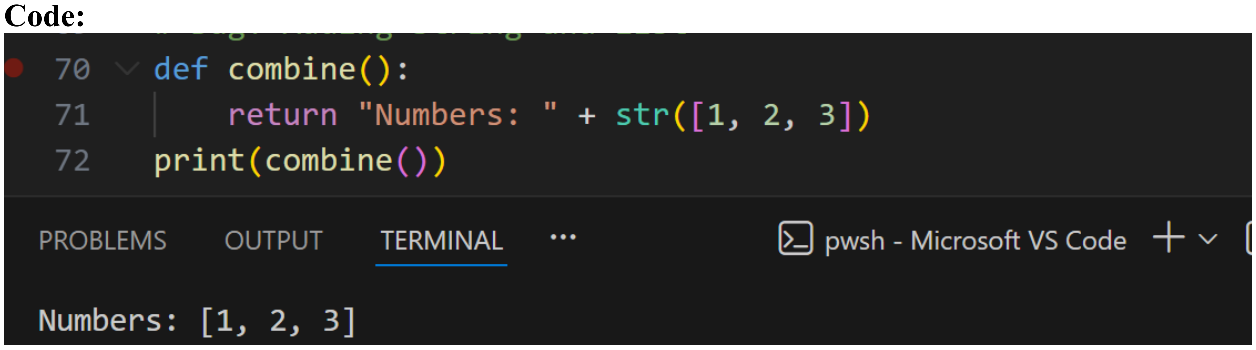
Requirements:

- 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

Code:



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

```
Numbers: [1, 2, 3]
```

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():

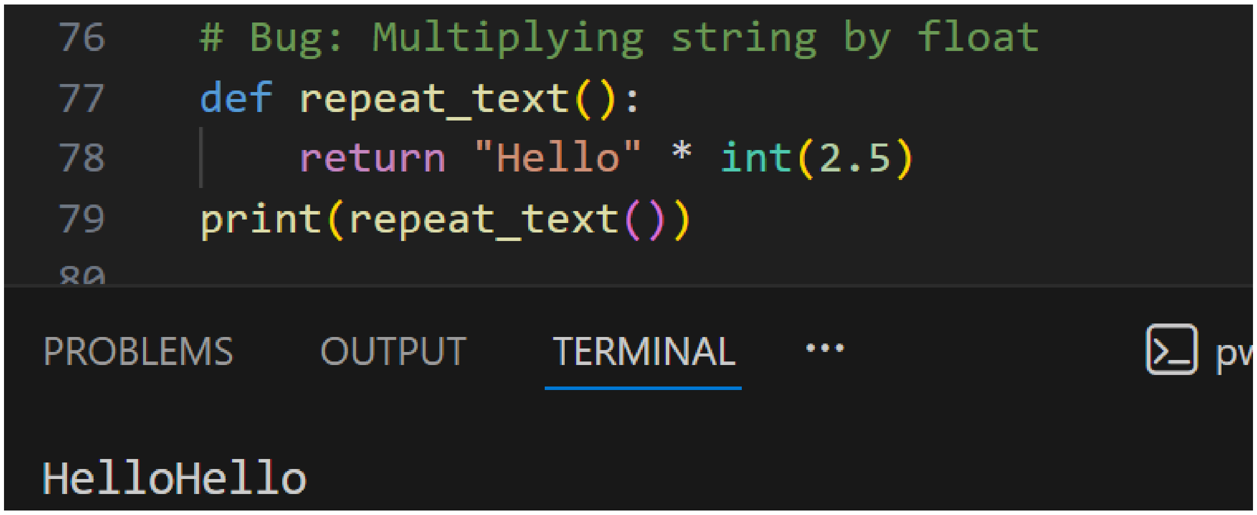
  return "Hello" * 2.5

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:



```
# Bug: Multiplying string by float
def repeat_text():
    return "Hello" * int(2.5)
print(repeat_text())
```

```
HelloHello
```

Task 14 (Type Error – Adding None to Integer)

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

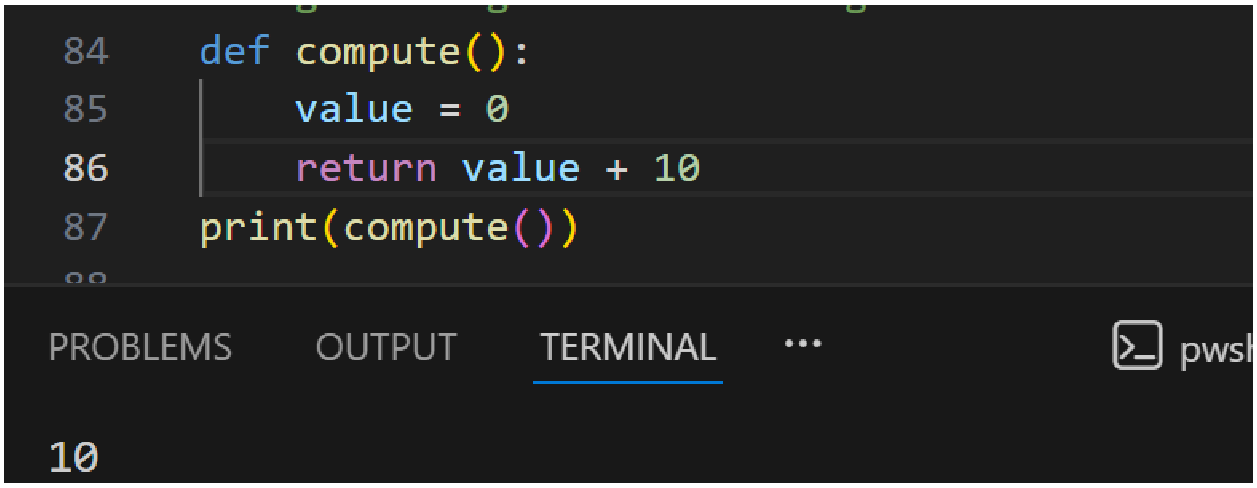
```
# Bug: Adding None and integer
def compute():
    value = None
    return value + 10

print(compute())
```

Requirements:

- Run and identify the error.
- Explain why NoneType cannot be added.
- Fix by assigning a default value.
- Validate using asserts.

Code:



```
def compute():
    value = 0
    return value + 10
print(compute())
```

```
10
```

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

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

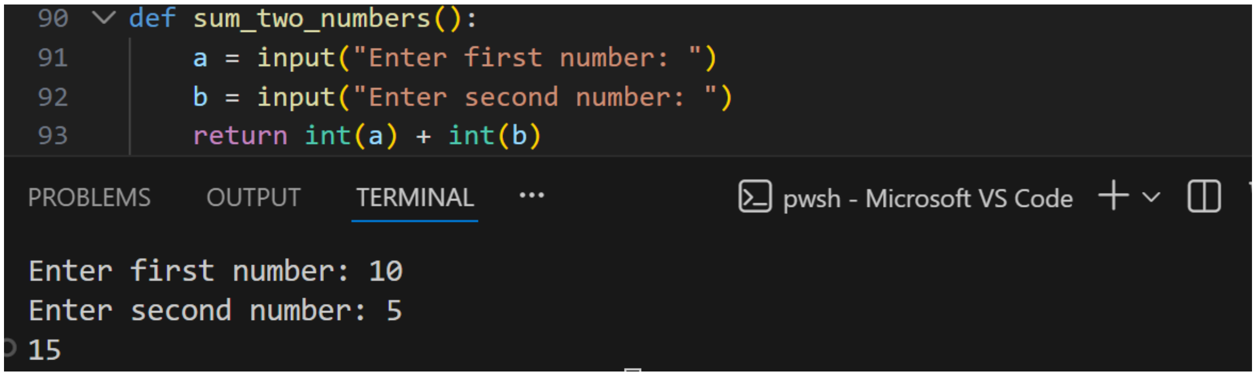
```
# Bug: Input remains string
def sum_two_numbers():
   a = input("Enter first number: ")
   b = input("Enter second number: ")
   return a + b


print(sum_two_numbers())
```

Requirements:

- Explain why input is always string.
- Fix using int() conversion.
- Verify with assert test cases.

Code:



```
def sum_two_numbers():
    a = input("Enter first number: ")
    b = input("Enter second number: ")
    return int(a) + int(b)
```

```
Enter first number: 10
Enter second number: 5
15
```