

# AI Assisted Coding

## Assignment 7.5

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Task\_01:

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.

Prompt:

"""Assume you have assigned the following task to debug the following code which has some errors.Analyze the code given below and rectify the errors to get the output"""

```
Lab7_5.py > ...
1  """Assume you have assigned the following task to debug the fol
2 → def add_item(item, items=[]):
3     items.append(item)
4     return items
5     def add_item(item, items=None):
6         if items is None:
7             items = []
8             items.append(item)
9             return items
10    print(add_item(1))
11    print(add_item(2))
```

The screenshot shows a code editor window with the file 'Lab7\_5.py' open. The code contains two definitions of the 'add\_item' function. The first definition uses a mutable default argument 'items=[]', which leads to a shared list bug. The second definition uses 'None' as the default argument and checks if it's None before creating a new list. The code is annotated with comments explaining the problem and the fix. The code editor interface includes tabs for PROBLEMS, OUTPUT, DEBUG CONSOLE, TERMINAL, PORTS, and more.

## Task-02

### 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

```
def check_sum():
    return (0.1 + 0.2) == 0.3
print(check_sum())
```

Output :

```
False
PS C:\Users\Vivek\OneDrive\Desktop\3-2\AI-Assisted-Coding> python "c:\Users\Vivek\OneDrive\Desktop\3-2\AI-Assisted-Coding\checksum.py"
False
PS C:\Users\Vivek\OneDrive\Desktop\3-2\AI-Assisted-Coding>
```

## Task-03:

### 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.

Prompt:

```
""" debug this code and re-write the correct code below """
# Bug: No base case
def countdown(n):
    print(n)
    return countdown(n-1)
countdown(5)
```

```
        if n == 0:
            return
```

```
        print(n)
```

```
        return countdown(n-1)
```

Output:

```
● P Open file in editor (ctrl + click) Desktop\3-2\AI-Assisted-Coding\Lab_5.py
  "c:\Users\Vivek\OneDrive\Desktop\3-2\AI-Assisted-Coding> python
  5
  4
  3
  2
  1
◆ PS C:\Users\Vivek\OneDrive\Desktop\3-2\AI-Assisted-Coding>
```

Task\_04:

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

Output:

```
● PS C:\Users\Vivek\OneDrive\Desktop\3-2\AI-Assisted-Coding> python -u
  5.py"
  Key not found
◆ PS C:\Users\Vivek\OneDrive\Desktop\3-2\AI-Assisted-Coding>
```

## Task\_05:

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.

Prompt:

""" You are a programming assistant. Analyze the following Python code and identify why the loop never ends. fix the code so that output prints numbers from 0 to 4."""

```
""" You are a programming assistant. Analyze the following Python code and identify why the loop never ends. fix the code so that output prints numbers from 0 to 4."""
def loop_example():
    i = 0
    while i < 5:
        print(i)
        i += 1
loop_example()
# Bug: Infinite loop due to missing increment of i
def loop_example():
    i = 0
    while i < 5:
        print(i)
        i += 1
    i = 0
    while i < 5:
        print(i)
        i += 1

loop_example()
```

Output:

```
● PS C:\Users\Vivek\OneDrive\Desktop\3-2\AI-Assisted-Coding> python -u "c:\Users\Vivek\OneDrive\Desktop\3-2\AI-Assisted-Coding\5.py"
0
1
2
3
4
◆ PS C:\Users\Vivek\OneDrive\Desktop\3-2\AI-Assisted-Coding>
```

## Task 06:

### Task 6 (Unpacking Error – Wrong Variables)

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

# Bug: Wrong unpacking

$$\mathbf{a}, \mathbf{b} = (1, 2, 3)$$

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

## Prompt:

""" debug this code and re-write the correct code below by Correct unpacking or using \_ for extra values. """

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

## Output

```
...
● PS C:\Users\Vivek\OneDrive\Desktop\3-2\AI-Assisted-Coding> py
5.py"
1 2
❖ PS C:\Users\Vivek\OneDrive\Desktop\3-2\AI-Assisted-Coding>
```

"""The error occurs because there are three values in the tuple (1, 2, 3) but only two variables (a and b) to unpack them into. To fix this, we can use an underscore (\_) as a placeholder for the extra value that we don't need. This way, we can unpack the first two values into a and b, and ignore the third value."""

## 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():
```

$$x = 5$$

v = 10

```
return x+y
```

Expected Output : Consistent indentation applied.

Prompt: """ debug this code by giving proper indentation and re-write the correct code below give inline suggestions where necessary"""

Code:

```
        debug this code by giving proper indentation and re-write the correct code
def func():
    x = 5
    y = 10
    return x+y
print(func())
def func():
    x = 5          # Indent the Line to be inside the function
    y = 10          # Indent the Line to be inside the function
    return x + y  # Indent the Line to be inside the function
```

Output:

```
PS C:\Users\Vivek\OneDrive\Desktop\3-2\AI-Assisted-Coding> py
5.py"
15
● PS C:\Users\Vivek\OneDrive\Desktop\3-2\AI-Assisted-Coding> py
```

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

Prompt:

""" debug this code by taking correct import module and re-write the correct code"""

Code:

```
47     """ debug this code by taking correct import module and re-w
48     import maths
49 -> print(maths.sqrt(16))  print(math.sqrt(16))
50
```

Output:

```
● PS C:\Users\Vivek\OneDrive\Desktop\3-2\AI-Assisted-Coding> python _5.py
4.0
◆ PS C:\Users\Vivek\OneDrive\Desktop\3-2\AI-Assisted-Coding>
```

### 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.

Prompt: """ debug this code by Analyze given code where a return inside a loop prevents full iteration. """

Code:

```
U      46      # print(func())           # This line is corr
U      47      # """ debug this code by taking correct
U      48      # import math
U      49      # print(math.sqrt(16))
S      50      """ debug this code by Analyze given cod
5       51      def total(numbers):
U      →      total = 0
U      52      for n in numbers:
U      53      |   return n
U      54      print(total([1,2,3]))
```

ES: W...

in ...

e i...

Output:

```
● ssisted-Coding> python -u "c:\Users\Vivek
neDrive\Desktop\3-2\AI-Assisted-Coding\La
_5.py"
6
● PS C:\Users\Vivek\OneDrive\Desktop\3-2\AI
◆ ssisted-Coding> 
```

### 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.

Prompt:

debug the given below code by Analyze given code where a variable is used before being defined.

it must follow the requirements :

fix the bug defining length and width as parameters ans also add 3 asserts test cases""""

Code:

```
fix the bug defining length and width as parameters
from turtle import width
def calculate_area():
    def calculate_area(length, width):
        return length * width
    print(calculate_area())
65 → print(calculate_area())
print(calculate_area(5, 3))

58 it must follow the requirements .
59 fix the bug defining length and width as parameters
60 from turtle import width
61
62
63 def calculate_area(length, width):
64     return length * width
65
66 print(calculate_area(5, 3))
67 → assert calculate_area(5, 3) == 15
      assert calculate_area(10, 2) == 20
      assert calculate_area(7, 4) == 28
```

Output:

```
15
PS C:\Users\Vivek\OneDrive\Desktop\3-2\AI-Assisted-Coding> python -u "c
ive\Desktop\3-2\AI-Assisted-Coding\Lab7_5.py"
15
PS C:\Users\Vivek\OneDrive\Desktop\3-2\AI-Assisted-Coding> [REDACTED]
[+] In 69. Col 34   Spaces: 4   UTF-8   CRLF   { } Python
```

### 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.

Prompt:

""" debug the given code by Analyze given code where integers and strings are added incorrectly.I need this requirements in the code • Fix the code by type conversion Verify with 3 assert cases give in line suggestions where necessary"""

Code:

```
def add_values():
    return 5 + int("10") # Convert the string "10" to an integer before adding
print(add_values())
```

Output:

```
vive\Desktop\3-2\AI-Assisted-Coding\Lab7_5.py"
```

```
15
```

```
PS C:\Users\Vivek\OneDrive\Desktop\3-2\AI-Assisted-Coding> 
```

### 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

Prompt: """ debug the given code by giving inline suggestions where necessary and Analyze given code where Analyze given code where a list is concatenated with a string without proper conversion. """

Code:

```
76
77     """ debug the given code by giving inline sugges
78     def combine():
79 →|         return "Numbers: " + [1, 2, 3]
        return "Numbers: " + str([1, 2, 3])
80     print(combine())
81
```

Output:

```
● PS C:\Users\Vivek\OneDrive\Desktop\3-2\AI-Assisted-Coding> p
ive\Desktop\3-2\AI-Assisted-Coding\Lab7_5.py"
Numbers: [1, 2, 3]
```

```
◆ PS C:\Users\Vivek\OneDrive\Desktop\3-2\AI-Assisted-Coding> 
```

```
Ln 79, Col 107   Spaces: 4   UTF-8   CR
```

### 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.

Prompt:

""" debug this code by suggesting the inline code and add few test cases"""

Code:

```
""" debug this code by suggesting the inline code and add few test cases"""
# def repeat_text():
#     return "Hello" * 2.5
# print(repeat_text())
"""The error occurs because we cannot multiply a string by a non-integer value (2.5)
def repeat_text():
    return "Hello" * int(2.5) # Convert 2.5 to an integer (which will be 2) before multiplying
print(repeat_text()) # Output: "HelloHello"
# Test cases
assert repeat_text() == "HelloHello" # Test case 1
assert repeat_text() != "HelloHelloHello" # Test case 2
assert repeat_text() == "HelloHello" # Test case 3
Terminal (Ctrl+C) - Issues found: 2
```

Output:

```
Numbers: [1, 2, 3]
● PS C:\Users\Vivek\OneDrive\Desktop\3-2\AI-Assisted-Coding> python -u "c:\Users\Vivek\Desktop\3-2\AI-Assisted-Coding\Lab7_5.py"
HelloHello
❖ PS C:\Users\Vivek\OneDrive\Desktop\3-2\AI-Assisted-Coding> []
```

## 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.

Prompt:

"""\ debug this code by suggesting the inline code and add few test cases requirements: • Run and identify the error.

Fix by assigning a default value. Validate using asserts.

"""

Code:

```
98     * validate using asserts.
99
100    """
101
102    def compute():
103        value = None
104        ↗ if value is None:
105            value = 0 # Assign a default value of 0
106
107        return value + 10
108
109
110    print(compute())
111
```

Output:

```
VIVEK_DESKTOP\3-2\AI Assisted Coding\tempcoderrunnerfile.py
● PS C:\Users\Vivek\OneDrive\Desktop\3-2\AI-Assisted-Coding
  vivek\Desktop\3-2\AI-Assisted-Coding\Lab7_5.py"
  10
◆ PS C:\Users\Vivek\OneDrive\Desktop\3-2\AI-Assisted-Coding
                                     Q  Ln 105, Col 17  Spaces: 4  UTF-8
```

## 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:

```
107     """ debug this code"""
108     def sum_two_numbers():
109         a = input("Enter first number: ")
110         b = input("Enter second number: ")
111 ↳     return a + b    return int(a) + int(b)
112
113     print(sum_two_numbers())
114
```

Output:

```
10
PS C:\Users\Vivek\OneDrive\Desktop\3-2\AI-Assisted-Coding> python -u
ive\Desktop\3-2\AI-Assisted-Coding\Lab7_5.py"
Enter first number: 25
Enter second number: 52
77
PS C:\Users\Vivek\OneDrive\Desktop\3-2\AI-Assisted-Coding>
```