

LAB ASSIGNMENT_7.5

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BATCH-12

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

Week4 -Monday:

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.

Refactor buggy code using responsible and reliable programming patterns.

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))
```

Prompt: Corrected function avoids shared list bug.

Expected Output:

```
def add_item(item, items=[]):
    items.append(item)
    return items
print(add_item(1))
print(add_item(2))
# The above code has a common pitfall in Python where the default mutable argument (items=[]) retains its state between function calls.
# To fix this, we should use None as the default value and initialize the list inside the function.
def add_item(item, items=None):
    if items is None:
        items = []
    items.append(item)
    return items
print(add_item(1))
print(add_item(2))
```

Output:

```
PS C:\Users\harik\My project> & C:/Users/harik/AppData/Local/Programs/Python/Python313/python.exe "c:/Users/harik/My project/Assets/ass7.5.py"
[1]
[1, 2]
PS C:\Users\harik\My project> & C:/Users/harik/AppData/Local/Programs/Python/Python313/python.exe "c:/Users/harik/My project/Assets/ass7.5.py"
[1]
[1, 2]
[1]
[2]
PS C:\Users\harik\My project>
```

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())
```

Prompt : Corrected function

Expected Output:

```
ts > ass7.5.py > ...
def check_sum():
    return (0.1 + 0.2) == 0.3
print(check_sum())
# This will print False due to floating-point precision issues in Python.
# To fix this, we can use the round function to compare the values with a certain precision.
def check_sum_fixed():
    return round(0.1 + 0.2, 10) == round(0.3, 10)
print(check_sum_fixed())
# This will print True as the rounding resolves the precision issue.
```

Output:

```
PS C:\Users\harik\My project> & C:/Users/harik/AppData/Local/Programs/Python/Python313/python.exe "c:/Users/harik/My project/Asses7.5.py"
False
PS C:\Users\harik\My project> & C:/Users/harik/AppData/Local/Programs/Python/Python313/python.exe "c:/Users/harik/My project/Asses7.5.py"
False
True
PS C:\Users\harik\My project>
```

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)
```

Prompt : Correct recursion with stopping condition

Expected Output :

```
#Fixed Code:
def countdown(n):
    if n <= 0:
        print("Countdown finished!")
        return
    print(n)
    return countdown(n-1)
```

Output:

```
PS C:\Users\harik\My project> & C:/Users/harik/AppData/Local/Programs/Python/Python313/python.exe "c:/Users/harik/My project/Assets/ass7.5.py"
5
4
3
2
1
Countdown finished!
```

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())
```

Prompt: Corrected with .get() or error handling.

Expected Output:

```
# correct the above code with .get() or error handling.
def get_value():
    data = {"a": 1, "b": 2}
    return data.get("c", 0)
print(get_value())
```

Output:

```
PS C:\Users\harik\My project> & C:/Users/harik/AppData/Local/Programs/Python/Python313/python.exe "c:/Users/harik/My project/Assets/ass7.5.py"
0
0
PS C:\Users\harik\My project> & C:/Users/harik/AppData/Local/Programs/Python/Python313/python.exe "c:/Users/harik/My project/Assets/ass7.5.py"
0
0
PS C:\Users\harik\My project>
```

Do you want to install the recommended 'Unity' extension from Microsoft for this repository?

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)
```

Prompt : Corrected loop increments i.

Expected Output:

```
def loop_example():
    i = 0
    while i < 5:
        print(i)
        i += 1
#correct the above code and handle the errors
def loop_example():
    i = 0
    while i < 5:
        print(i)
        i += 1
loop_example()
loop_example()
#Corrected loop increments i.
def loop_example():
    i = 0
```

```
#Corrected loop increments i.
def loop_example():
    i = 0
    while i < 5:
        print(i)
        i += 1
loop_example()
loop_example()
```

Output:

```

0
1
2
3
4
0
1
2
3
4
0
1

```

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)
```

Prompt: Correct unpacking or using _ for extra values.

Expected Output:

```

1 """Task 6 (Unpacking Error - Wrong Variables)
2 Task: Analyze given code where tuple unpacking fails. Use AI to
3 fix it.
4 # Bug: Wrong unpacking
5 a, b = (1, 2, 3)
6 Expected Output: Correct unpacking or using _ for extra values."""
7 a, b, _ = (1, 2, 3)
8 print(a)
9 print(b)
10

```

Output:

```

PS C:\Users\CHAITRA REDDY\OneDrive\Desktop\AI Assistant coding> "C:\Users\CHAITRA REDDY\AppData\Local\Microsoft\WindowsApps\python3.13.exe" "C:\Users\CHAITRA REDDY\OneDrive\Desktop\AI Assistant coding\LAB7.PY"
1
2
PS C:\Users\CHAITRA REDDY\OneDrive\Desktop\AI Assistant coding>

```

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.

```
Go Run Terminal Help ← → Q AI Assistant coding
LAB7.PY x Untitled-1 import socket.py Search Search
LAB7.PY > -
1 """Task 7 (Mixed Indentation Tabs vs Spaces)
2 Task: Analyze given code where mixed indentation breaks
3 execution. Use AI to fix it.
4 # Bug: Mixed indentation
5 def func():
6     x = 5
7     y = 10
8     return x+y
9 Expected Output : Consistent indentation applied."""
10 def func():
11     x = 5
12     y = 10
13     return x + y
14 print(func())
15
```

Output:

```
PS C:\Users\CHAITRA REDDY\OneDrive\Desktop\AI Assistant coding> & "C:\Users\CHAITRA REDDY\AppData\Local\Microsoft\WindowsApps\python3.13.exe" "c:/Users/CHAITRA REDDY/OneDrive/Desktop/AI Assistant coding/LAB7.PY"
15
PS C:\Users\CHAITRA REDDY\OneDrive\Desktop\AI Assistant coding>
Ln 15, Col 1 Spaces: 4 UTF-8 CRLF Python Python 3
```

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))

Prompt : Corrected to import math

Expected Output:

```
Go Run Terminal Help ← → Q AI Assistant coding
LAB7.PY x Untitled-1 import socket.py Search Search
LAB7.PY
1 """Task 8 (Import Error Wrong Module Usage)
2 Task: Analyze given code with incorrect import. Use AI to fix.
3 # Bug: Wrong import
4 import maths
5 print(maths.sqrt(16))
6 Expected Output: Corrected to import math"""
7 import math
8 print(math.sqrt(16))
9
10
```

Output:

```
PS C:\Users\CHAITRA REDDY\OneDrive\Desktop\AI Assistant coding> & "C:\Users\CHAITRA REDDY\AppData\Local\Microsoft\WindowsApps\python3.13.exe" "c:/Users/CHAITRA REDDY/OneDrive/Desktop/AI Assistant coding/LAB7.PY"
4.0
PS C:\Users\CHAITRA REDDY\OneDrive\Desktop\AI Assistant coding>
Ln 9, Col 1 Spaces: 4 UTF-8 CRLF Python Python 3.13 8-8 Go Live
```