

COURSE: AI ASSISTED CODING

Lab 7: Error Debugging with AI: Systematic approaches to finding

NAME: PRAVALIKA MUTHOJU

BATCH : 34

BRANCH :CSE(AIML)

Task 1 – Runtime Error Due to Invalid Input Type

- A Python program accepts user input and performs arithmetic operations. However, the program throws a runtime error because the input is treated as a string instead of a numeric type.

Example (Buggy Code):

```
num = input("Enter a number: ")  
result = num + 10  
print(result)
```

• Task:

Use AI tools to identify the cause of the runtime error and modify the program so it executes correctly.

Expected Output -1:

- AI converts the input to the appropriate numeric type and eliminates the runtime error.

```

File Edit Selection View Go Run Terminal Help ← → ⌂ ? ⌄ ⌅ ⌆ ⌇ ⌈ ⌉ ⌊ ⌋ ⌍ ⌎
RUN AND DEBUG ... AI ASSISTED CODE AI LAB7.py ...
VARIABLES C:\Users\UMTHOJU PRAVALIKA> OneDrive > Desktop > AI ASSISTED CODE > AI LAB7.py > ...
1     """num = input("Enter a number: ")
2     result = num + 10
3     print(result)"""
4
5     # Use int() if the number should be an integer.
6
7     # Use float() if decimals are allowed.
8     num = float(input("Enter a number: "))
9     result = num + 10
10    print(result)
11
WATCH PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
/AI LAB7.py" PS C:\Users\UMTHOJU PRAVALIKA> & "C:/Users/UMTHOJU PRAVALIKA/AppData/Local/Programs/Python/Python311/python.exe" "c:/Users/UMTHOJU PRAVALIKA/OneDrive/Desktop/AI ASSISTED CODE/AI LAB7.py"
CALL STACK Running Enter a number: 3
Traceback (most recent call last):
  File "c:/Users/UMTHOJU PRAVALIKA/OneDrive/Desktop/AI ASSISTED CODE/AI LAB7.py", line 2, in <module>
    result = num + 10
           ^
TypeError: can only concatenate str (not "int") to str
PS C:\Users\UMTHOJU PRAVALIKA> & "C:/Users/UMTHOJU PRAVALIKA/AppData/Local/Programs/Python/Python311/python.exe" "c:/Users/UMTHOJU PRAVALIKA/OneDrive/Desktop/AI ASSISTED CODE/AI LAB7.py"
/AI LAB7.py" Enter a number: 3
Traceback (most recent call last):
  File "c:/Users/UMTHOJU PRAVALIKA/OneDrive/Desktop/AI ASSISTED CODE/AI LAB7.py", line 2, in <module>
    result = num + 10
           ^
TypeError: can only concatenate str (not "int") to str
PS C:\Users\UMTHOJU PRAVALIKA> & "C:/Users/UMTHOJU PRAVALIKA/AppData/Local/Programs/Python/Python311/python.exe" "c:/Users/UMTHOJU PRAVALIKA/OneDrive/Desktop/AI ASSISTED CODE/AI LAB7.py"
/AI LAB7.py" Enter a number: 5
15.0
PS C:\Users\UMTHOJU PRAVALIKA>
BREAKPOINTS
■ Raised Exceptions
■ Uncaught Exceptions
■ User Uncaught Exceptions

```

Task Description

Task 2 – Incorrect Function Return Value

A function is designed to calculate the square of a number, but it does not return the computed result properly.

Example (Buggy Code):

```
def square(n):
    result = n * n
```

Task:

Use AI assistance to analyze the function and ensure the correct value is returned.

Expected Output -2:

AI fixes the missing return statement and the function returns the correct output.

The screenshot shows a code editor interface with a dark theme. At the top, there's a navigation bar with 'File', 'Edit', 'Selection', 'View', 'Go', 'Run', 'Terminal', and 'Help' options. Below the navigation bar is a search bar with a magnifying glass icon and the placeholder 'Search'. The main area is divided into two tabs: 'AI ASS6.py' and 'AI LAB7.py 1'. The 'AI LAB7.py 1' tab is active, displaying the following Python code:

```

7 #Use float() if decimals are allowed.
8 num = float(input("Enter a number: "))
9 result = num + 10
10 print(result)"""
11
12
13 def square(n):
14     result = n * n
15     return result
16 #The function calculates the square but does not return it so give code again.
17 def square(n):
18     result = n * n
19     return result
20 print(square(5)) # Example usage
21
22
23
24

```

Below the code editor is a terminal window with the following text:

```

PS C:\Users\MUTHOJU PRAVALIKA> & "C:/Users/MUTHOJU PRAVALIKA/AppData/Local/Programs/Python/Python311/python.exe" "c:/Users/MU
● PS C:\Users\MUTHOJU PRAVALIKA> & "C:/Users/MUTHOJU PRAVALIKA/AppData/Local/Programs/Python/Python311/python.exe" "c:/Users/MU
● PS C:\Users\MUTHOJU PRAVALIKA> & "C:/Users/MUTHOJU PRAVALIKA/AppData/Local/Programs/Python/Python311/python.exe" "c:/Users/MU
25
○ PS C:\Users\MUTHOJU PRAVALIKA>

```

Task Description

Task 3 – IndexError in List Traversal

A Python program iterates over a list using incorrect index limits, causing an IndexError.

Example (Buggy Code):

```

numbers = [10, 20, 30]

for i in range(0, len(numbers)+1):

    print(numbers[i])

```

Task:

Use AI to identify the incorrect loop boundary and correct the iteration logic.

Expected Output -3:

AI fixes the loop condition and prevents out-of-range list access.

```

C:\> Users > MUTHOJU PRAVALIKA > OneDrive > Desktop > AI ASSISTED CODE > AI LAB7.py > ...
20     print(square(5)) # Example usage
21
22
23     numbers = [10, 20, 30]
24     for i in range(0, len(numbers)+1):
25         print(numbers[i])"""
26
27
28
29
30     numbers = [10, 20, 30]
31
32     for i in range(len(numbers)): # stops at len-1
33         print(numbers[i])
34

```

TERMINAL

```

PS C:\Users\UMUTHOJU PRAVALIKA> & "C:/Users/UMUTHOJU PRAVALIKA/AppData/Local/Programs/Python/Python311/python.exe"
PS C:\Users\UMUTHOJU PRAVALIKA> & "C:/Users/UMUTHOJU PRAVALIKA/AppData/Local/Programs/Python/Python311/python.exe"
25
PS C:\Users\UMUTHOJU PRAVALIKA> & "C:/Users/UMUTHOJU PRAVALIKA/AppData/Local/Programs/Python/Python311/python.exe"
10
20
30
Traceback (most recent call last):
  File "c:/Users/UMUTHOJU PRAVALIKA/OneDrive/Desktop/AI ASSISTED CODE/AI LAB7.py", line 25, in <module>
    print(numbers[i])
           ^^^^^^
IndexError: list index out of range
PS C:\Users\UMUTHOJU PRAVALIKA> & "C:/Users/UMUTHOJU PRAVALIKA/AppData/Local/Programs/Python/Python311/python.exe"
  File "c:/Users/UMUTHOJU PRAVALIKA/OneDrive/Desktop/AI ASSISTED CODE/AI LAB7.py", line 25
    print(numbers[i])"""
      ^
SyntaxError: unterminated triple-quoted string literal (detected at line 33)
PS C:\Users\UMUTHOJU PRAVALIKA> & "C:/Users/UMUTHOJU PRAVALIKA/AppData/Local/Programs/Python/Python311/python.exe"
● 10
● 20
● 30
○ PS C:\Users\UMUTHOJU PRAVALIKA>

```

REAKPOINTS

- Raised Exceptions
- Uncaught Exceptions
- User Uncaught Exceptions

Indexing completed.

Task 4 – Uninitialized Variable Usage

A program uses a variable in a calculation before assigning it any value.

Example (Buggy Code):

if True:

pass

print(total)

Task:

Use AI tools to detect the uninitialized variable and correct the program.

Expected Output -4:

AI initializes the variable correctly before it is used

The screenshot shows a code editor interface with a dark theme. On the left, there's a sidebar with a 'Run and Debug' section containing instructions on how to run the code. The main area contains a Python script with line numbers from 31 to 50. Line 38 contains a syntax error: 'print(total)''' instead of 'print(total)'. The terminal tab at the bottom shows the command line and the resulting traceback and output.

```

C:\> Users > MUTHOJU PRAVALIKA > OneDrive > Desktop > AI ASSISTED CODE > AI LAB7.py > ...
31
32     for i in range(len(numbers)): # stops at len-1
33         print(numbers[i]) """
34
35
36     """if True:
37     |o pass
38     print(total)"""
39
40
41
42     # Task 4 - Uninitialized Variable Fix
43     total = 0 # Initialize the variable before use
44
45     # Example operation
46     if True:
47         total += 5
48
49     print("Total:", total)
50

```

PROBLEMS	OUTPUT	DEBUG CONSOLE	TERMINAL	PORTS
----------	--------	---------------	-----------------	-------

```

PS C:\Users\MUTHOJU PRAVALIKA> & "C:/Users/MUTHOJU PRAVALIKA/AppData/Local/Programs/Python/Python39/python.exe" "c:/Users/MUTHOJU PRAVALIKA/Desktop/AI ASSISTED CODE/AI LAB7.py"
Traceback (most recent call last):
  File "c:/Users/MUTHOJU PRAVALIKA/Desktop/AI ASSISTED CODE/AI LAB7.py", line 38, in <module>
    print(total)
           ^
NameError: name 'total' is not defined
PS C:\Users\MUTHOJU PRAVALIKA> & "C:/Users/MUTHOJU PRAVALIKA/AppData/Local/Programs/Python/Python39/python.exe" "c:/Users/MUTHOJU PRAVALIKA/Desktop/AI ASSISTED CODE/AI LAB7.py"
Total: 5
PS C:\Users\MUTHOJU PRAVALIKA>

```

Task Description

Task 5 – Logical Error in Student Grading System

A grading program assigns incorrect grades due to improper conditional logic.

Example (Buggy Code):

```

marks = 85

if marks >= 90:
    grade = "A"

elif marks >= 80:
    grade = "C"

else:
    grade = "B"

print(grade)

```

Task:

Use AI to analyze the grading conditions and correct the logical flow.

Expected Output -5:

AI corrects the conditional logic so grades are assigned accurately.

The screenshot shows the Visual Studio Code interface. The top menu bar includes File, Edit, Selection, View, Go, Run, Terminal, Help, and a search bar. A sidebar on the left has sections for RUN AND DEBUG, RUN, and a note about Run and Debug settings. The main editor area contains Python code for a grading system. The terminal tab at the bottom is active, showing command-line output for running the script and entering marks.

```
File Edit Selection View Go Run Terminal Help ← → Q Search
RUN AND DEBUG ...
RUN
Run and Debug
To customize Run and Debug, open a folder and create a launch.json file.
Debug using a terminal command or in an interactive chat.
C > Users > MUTHOJU PRAVALIKA > OneDrive > Desktop > AI ASSISTED CODE > AI LAB7.py > ...
58 elif marks >= 80:
59 |   grade = "C"
60 else:
61 |   grade = "B"
62 print(grade)
63 """
64
65 # Task 5 - Logical Error Fix in Grading System
66 marks = int(input("Enter marks: ")) # Convert input to integer
67
68 if marks >= 90:
69 |   grade = "A"
70 elif marks >= 80:
71 |   grade = "B"
72 elif marks >= 70:
73 |   grade = "C"
74 else:
75 |   grade = "D"
76
77 print("Grade:", grade)
78
79
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
PS C:\Users\MUTHOJU PRAVALIKA> & "C:/Users/MUTHOJU PRAVALIKA/AppData/Local/Programs/Python/Python311/python
C
PS C:\Users\MUTHOJU PRAVALIKA> & "C:/Users/MUTHOJU PRAVALIKA/AppData/Local/Programs/Python/Python311/python
Enter marks: 98
Grade: A
PS C:\Users\MUTHOJU PRAVALIKA>
```