

# AI Assisted Coding

Name: Saisuraj Telu

Hall.no: 2403A54L01

Assignment: 7.1

## Task1:

**Task Description #1** (Syntax Errors – Missing Parentheses in Print Statement)

Task: Provide a Python snippet with a missing parenthesis in a print statement (e.g., print "Hello"). Use AI to detect and fix the syntax error.

# Bug: Missing parentheses in print statement

```
def greet():  
    print "Hello, AI Debugging Lab!"  
greet()
```

Requirements:

- Run the given code to observe the error.
- Apply AI suggestions to correct the syntax.
- Use at least 3 assert test cases to confirm the corrected code works.

Expected Output #1:

- Corrected code with proper syntax and AI explanation.

## Ai generated code:

```
ai_ass.7.1.py > ...  
9  def greet():  
10     return "Hello, AI Debugging Lab!"  
11  
12  
13 # Function to return first 10 multiples of a given number  
14 def print_multiples(number):  
15     result = []  
16     for i in range(1, 11):  
17         result.append(f"{number} x {i} = {number * i}")  
18     return result  
19  
20  
21 # Demonstration output  
22 print(greet())  
23 print("\nFirst 10 multiples of 5:")  
24 for line in print_multiples(5):  
25     print(line)  
26  
27  
28 # Assert test cases  
29 def test_print_multiples():  
30     # Test case 1  
31     assert print_multiples(3)[0] == "3 x 1 = 3"  
32  
33     # Test case 2  
34     assert print_multiples(7)[9] == "7 x 10 = 70"  
35  
36     # Test case 3  
37     assert print_multiples(-5)[4] == "-5 x 5 = -25"  
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```

## Prompt:

```
#Create a simple Python program that contains a syntax error caused by
missing

parentheses in a print statement. Run the code to observe the error, then
use AI

assistance to identify and fix the syntax issue. After correcting the
code, add

at least three assert test cases to verify that the function works
correctly.

Keep the explanation clear and beginner-friendly, and ensure the final
program

runs without errors.
```

## Task2:

### Task Description #2 (Incorrect condition in an If Statement)

Task: Supply a function where an if-condition mistakenly uses = instead of ==. Let AI identify and fix the issue.

# Bug: Using assignment (=) instead of comparison (==)

```
def check_number(n):
    if n = 10:
        return "Ten"
    else:
        return "Not Ten"
```

Requirements:

- Ask AI to explain why this causes a bug.
- Correct the code and verify with 3 assert test cases.

Expected Output #2:

- Corrected code using == with explanation and successful test execution.

## AI generated code

## Prompt:

```
45 # Uncomment to see the logical error
46 def is_even(number):
47     if number % 2 == 0:
48         return True
49     else:
50         return False
51 # FIXED CODE
52 def is_even(number):
53     if number % 2 == 0:
54         return True
55     else:
56         return False
57 # Demonstration output
58 print("Checking if numbers are even:")
59 for num in [4, 7, 10, 13]:
60     result = is_even(num)
61     print(f"{num} is even: {result}")
62 # Assert test cases
63 def test_is_even():
64     # Test case 1
65     assert is_even(4) == True
66
67     # Test case 2
68     assert is_even(7) == False
69
70     # Test case 3
71     assert is_even(0) == True
72 test_is_even()
73 print("\nAll test cases passed!")
74
```

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```
Checking if numbers are even:
4 is even: True
7 is even: False
10 is even: True
13 is even: False

All test cases passed!
```

#Create a simple Python function that contains a bug where an if condition incorrectly uses the assignment operator (=) instead of the comparison operator (==). Run the code to observe the error, then use AI assistance to identify and explain why this causes a bug. Correct the condition using == and verify the fix by adding at least three assert test cases. Keep the code and explanation clear, beginner-friendly, and ensure the final program runs without errors

## Task3:

### Task Description #3 (Runtime Error – File Not Found)

Task: Provide code that attempts to open a non-existent file and crashes. Use AI to apply safe error handling.

# Bug: Program crashes if file is missing

```
def read_file(filename):
    with open(filename, 'r') as f:
        return f.read()
    print(read_file("nonexistent.txt"))
```

Requirements:

- Implement a try-except block suggested by AI.
- Add a user-friendly error message.
- Test with at least 3 scenarios: file exists, file missing, invalid path.

Expected Output #3:

- Safe file handling with exception management.

## Ai generated code:

## Prompt:

```
78 def read_file(file_path):
79     try:
80         with open(file_path, 'r') as file:
81             return file.read()
82     except FileNotFoundError:
83         return f"Error: The file '{file_path}' does not exist."
84     except Exception as e:
85         return f"Error: An unexpected error occurred while reading the file: {e}"
86
87 # Demonstration output
88 print("Testing file reading with error handling:\n")
89 # Test case 1: File exists
90 print("Test Case 1: Existing file")
91 with open("existing_file.txt", "w") as f:
92     f.write("This is a test file.")
93 print(read_file("existing_file.txt"))
94 # Test case 2: File is missing
95 print("\nTest Case 2: Missing file")
96 print(read_file("missing_file.txt"))
97 # Test case 3: Invalid file path
98 print("\nTest Case 3: Invalid file path")
99 print(read_file("/invalid/path/to/file.txt"))
```

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```
Test Case 1: Existing file
This is a test file.

Test Case 2: Missing file
Error: The file 'missing_file.txt' does not exist.

Test Case 3: Invalid file path
Error: The file '/invalid/path/to/file.txt' does not exist.
```

```
#Create a Python program that attempts to open a file that does not
exist,

causing a runtime error. Run the program to observe the crash, then use
AI

assistance to apply safe error handling using a try-except block. Modify
the code

to display a clear, user-friendly error message instead of crashing.
Finally,

test the corrected program with at least three scenarios: when the file
exists,

when the file is missing, and when an invalid file path is provided.
Ensure the

final code runs safely without errors
```

## Task4:

Ai generated code:

## Prompt:

```
103 class Calculator:
104     def __init__(self):
105         self.result = 0
106
107     def add(self, num):
108         self.result += num
109
110     def get_result(self):
111         return self.result
112
113 # # FIXED CODE
114 class Calculator:
115     def __init__(self):
116         self.result = 0
117
118     def add(self, num):
119         self.result += num
120
121     def get_result(self):
122         return self.result
123
124 # # Demonstration output
125 calc = Calculator()
126 calc.add(5)
127 print(calc.get_result()) # Should print 5
128
129 # Assert test cases
130 def test_calculator():
131     calc = Calculator()
132
133     # Test case 1: Initial result is 0
134     assert calc.get_result() == 0
135
136     # Test case 2: Adding a number changes the result
137     calc.add(10)
138     assert calc.get_result() == 10
139
140     # Test case 3: Adding multiple numbers accumulates correctly
141     calc.add(5)
142     assert calc.get_result() == 15
143
144 test_calculator()
145 print("\nAll test cases passed!")
```

method

- Use 3 assert tests to confirm the corrected class works.

Expected Output #4:

- Corrected class with clear AI explanation.

```
#Create a simple Python program to calculate the sum of the first n
natural
numbers. First, write a function named sum_to_n(n) that uses a for loop
to
compute the sum. Then, implement an alternative solution using a while
loop or a
mathematical formula. Display the result for sample inputs and keep the
code
clear, beginner-friendly, and easy to understand. Ensure the program runs
without
errors and clearly shows the output
```

## Task5:

**Task Description #5** (TypeError – Mixing Strings and Integers in Addition)

Task: Provide code that adds an integer and string ("5" + 2) causing a TypeError. Use AI to resolve the bug.

# Bug: TypeError due to mixing string and integer

```
def add_five(value):
    return value + 5
print(add_five("10"))
```

Requirements:

- Ask AI for two solutions: type casting and string concatenation.
- Validate with 3 assert test cases.

Expected Output #5:

- Corrected code that runs successfully for multiple inputs.

Note: Report should be submitted a word document for all tasks in a single document with prompts, comments & code explanation, and output and if required, screenshots

## Prompt:

```
ai-ass.7.1.py 2
150 # Enhancement to see the TypeError
151 def add_string_and_int():
152     return "10" + 5
153 # FIXED CODE - Approach 1: Type Casting
154 def add_string_and_int_cast():
155     return "10" + str(5)
156 # FIXED CODE - Approach 2: String Concatenation
157 def add_string_and_int_concat():
158     return "10" + "5"
159 # Demonstration output
160 print("Adding string and integer with type casting:")
161 print(add_string_and_int_cast()) # Should print "105"
162 print("\nAdding string and integer with string concatenation:")
163 print(add_string_and_int_concat()) # Should print "105"
164 # Assert test cases
165 def test_add_string_and_int():
166     # Test case 1: Type casting approach
167     assert add_string_and_int_cast() == "105"
168     # Test case 2: String concatenation approach
169     assert add_string_and_int_concat() == "105"
170     # Test case 3: Both approaches should yield the same result
171     assert add_string_and_int_cast() == add_string_and_int_concat()
172 test_add_string_and_int()
173 print("\nAll test cases passed!")
174
```

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Adding string and integer with type casting:  
105

Adding string and integer with string concatenation:  
105

All test cases passed!

## Ai generated code

```
#Create a simple Python program that causes a TypeError by trying to add
a string

and an integer (for example, "10" + 5). Run the code to observe the
error, then

use AI assistance to identify and explain why the error occurs. Fix the
problem

using two different approaches: first by applying type casting, and
second by

using string concatenation. Verify both solutions by adding at least
three assert

test cases. Keep the code clear, beginner-friendly, and ensure the final
program

runs successfully for multiple inputs.
```