AI ASSISTED CODING

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ASSIGNMENT:7.3

Lab 6: AI-Based Code Completion – Classes, Loops, and Conditionals

Lab Objectives:

- To identify and correct syntax, logic, and runtime errors in 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 Description#1

- Paste a function with a missing colon (add(a, b)), and let AI fix the syntax error.

```
python

def add(a, b)
    return a + b
```

CODE:

```
def add(a, b):
    return a + b


print(add(3, 5))
```

FIX OF ERROR:
It must end with a colon (:).

Expected Output#1

- Corrected function with syntax fix

```
8
```

Task Description#2 (Loops)

- Identify and fix a logic error in a loop that causes infinite iteration.

```python
def count_down(n):
    while n >= 0:
        print(n)
        n += 1  # Should be n -= 1
```

CODE:

```
def count_down(n):
    while n >= 0:
        print(n)
        n -= 1    #
```

FIXERROR:

The loop condition is while n >= 0.
Inside the loop, n += 1 makes n increase forever, so it never becomes less than 0 → infinite loop

Expected Output#2

- AI fixes increment/decrement error

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

Task Description#3

- Debug a runtime error caused by division by zero. Let AI insert try-except.

```
# Debug the following code
def divide(a, b):
    return a / b

print(divide(10, 0))
```

CODE:

```python
def divide(a, b):
    try:
        return a / b
    except ZeroDivisionError:
        return "Error: Division by zero is not allowed"

print(divide(10, 0))
```

FIXERROR:
This will raise a ZeroDivisionError at runtime because b = 0.
In Python, division by zero is not allowed

Expected Output#3

- Corrected function with safe error handling

```
Error: Division by zero is not allowed
```

Task Description#4

- Provide a faulty class definition (missing self in parameters). Let AI fix it

```python
class Rectangle:
    def __init__(length, width):
        self.length = length
        self.width = width
```

CODE:

```python
class Rectangle:
    def __init__(self, length, width):
        self.length = length
        self.width = width
```

FIXERROR:
In Python, instance methods (including __init__) must include self as the first parameter.
Without self, Python doesn't know which object's attributes (length and width) to assign.

Expected Output#4

- Correct __init__() method and explanation

```
rect = Rectangle(10, 5)
print(rect.length)  # Output: 10
print(rect.width)   # Output: 5
```

Task Description#5

- Access an invalid list index and use AI to resolve the Index Error.

```
python

numbers = [1, 2, 3]
print(numbers[5])
```

CODE:

Fix 1: Check index before accessing

```
numbers = [1, 2, 3]
index = 5

if index < len(numbers):
    print(numbers[index])
else:
    print("Index out of range")
```

Fix 2: Use try-except

```
numbers = [1, 2, 3]

try:
    print(numbers[5])
except IndexError:
    print("Error: Invalid index")
```

Fix 3: Safe access with default value

```
numbers = [1, 2, 3]
index = 5

value = numbers[index] if index < len(numbers) else None
print(value)   # Output: None
```

FIXERROR:

IndexError: list index out of range

Expected Output#5

- AI suggests checking length or using safe access logic

Fix 1: Check index before accessing:

```
Index out of range
```

Fix 2: Use try-except:

```
Error: Invalid index
```

Fix 3: Safe access with default value:

```
None
```

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

Evaluation Criteria:

Criteria	Max Marks
Identification of bugs	0.5
Application of AI-suggested fixes	0.5
Explanation and understanding of errors	0.5
Corrected code functionality	0.5
Report structure and reflection	0.5
Total	**2.5 Marks**