# *AI Assisted Coding (III Year) Assignment*

## *Lab 7: Error Debugging with AI – Systematic Approaches to Finding and Fixing Bugs*

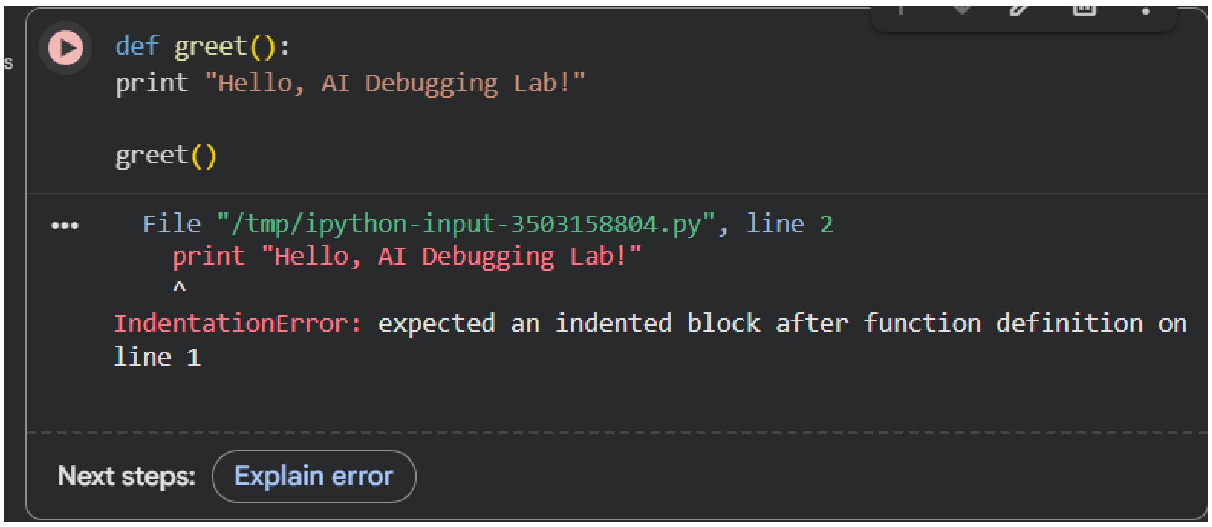
***Week 4 – Monday***

### ***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.***

### ***Task 1: Syntax Error – Missing Parentheses in Print Statement***

***Buggy Code***



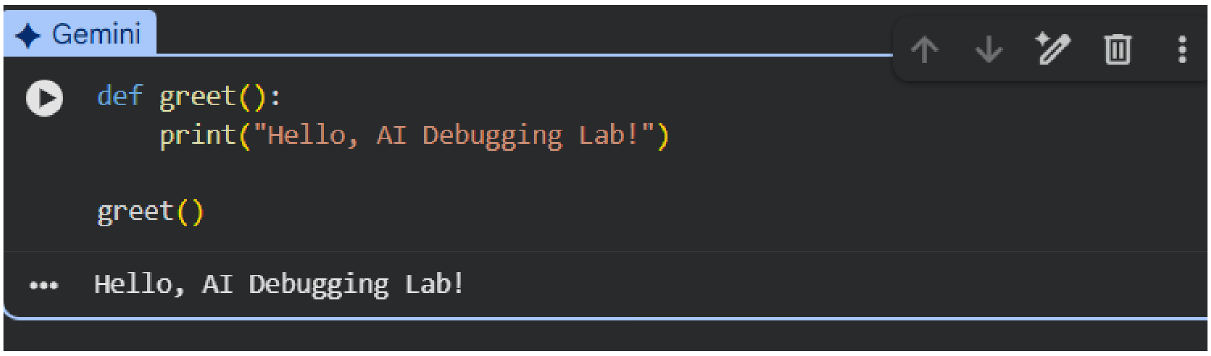
```
def greet():
print "Hello, AI Debugging Lab!"

greet()
```

```
  File "/tmp/ipython-input-3503158804.py", line 2
    print "Hello, AI Debugging Lab!"
    ^
IndentationError: expected an indented block after function definition on
line 1
```

***Observed Error***

- *SyntaxError occurs because Python 3 requires parentheses in print().*

*AI Fix (Corrected Code):*



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

greet()
```

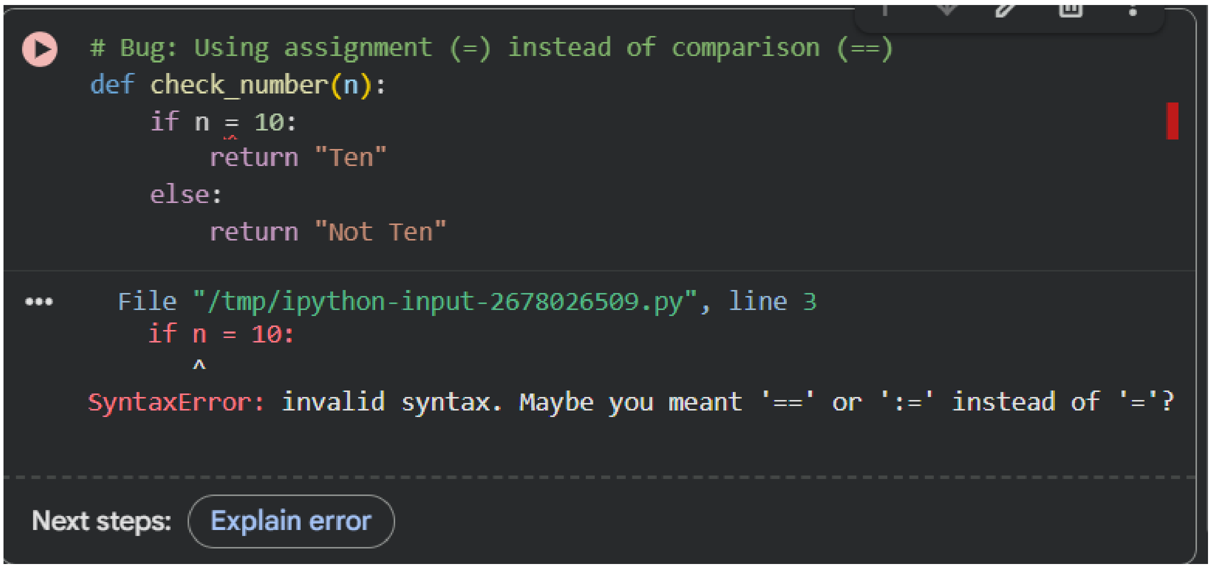
```
Hello, AI Debugging Lab!
```

*Explanation*

- *In Python 3, print is a function, so parentheses are mandatory.*
- *Indentation was also corrected.*

**Task 2: Logic Error – Incorrect Condition in If Statement**

**Buggy Code**



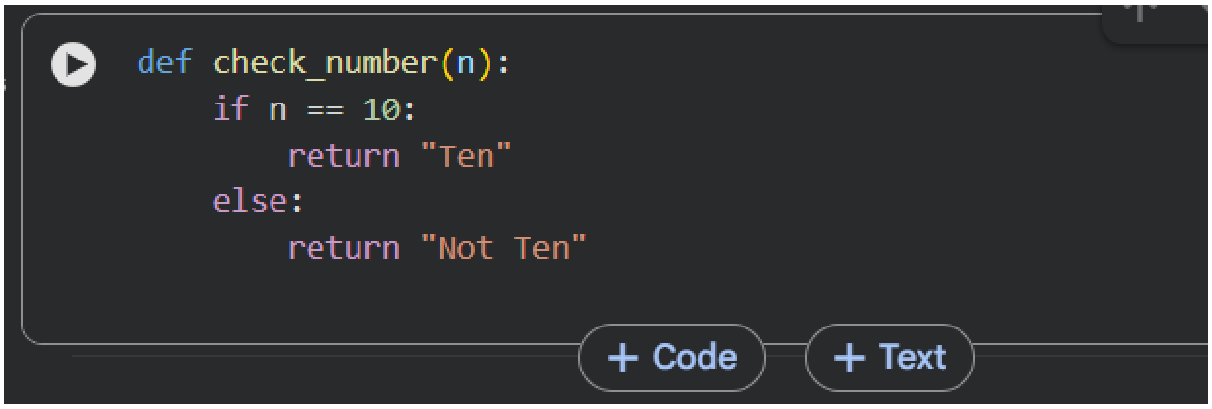
```
# Bug: Using assignment (=) instead of comparison (==)
def check_number(n):
    if n = 10:
        return "Ten"
    else:
        return "Not Ten"
```

```
  File "/tmp/ipython-input-2678026509.py", line 3
    if n = 10:
       ^
SyntaxError: invalid syntax. Maybe you meant '==' or ':=' instead of '='?
```

***Why This Causes a Bug***

- ***= is used for assignment, not comparison.***
- ***Conditions require ==.***

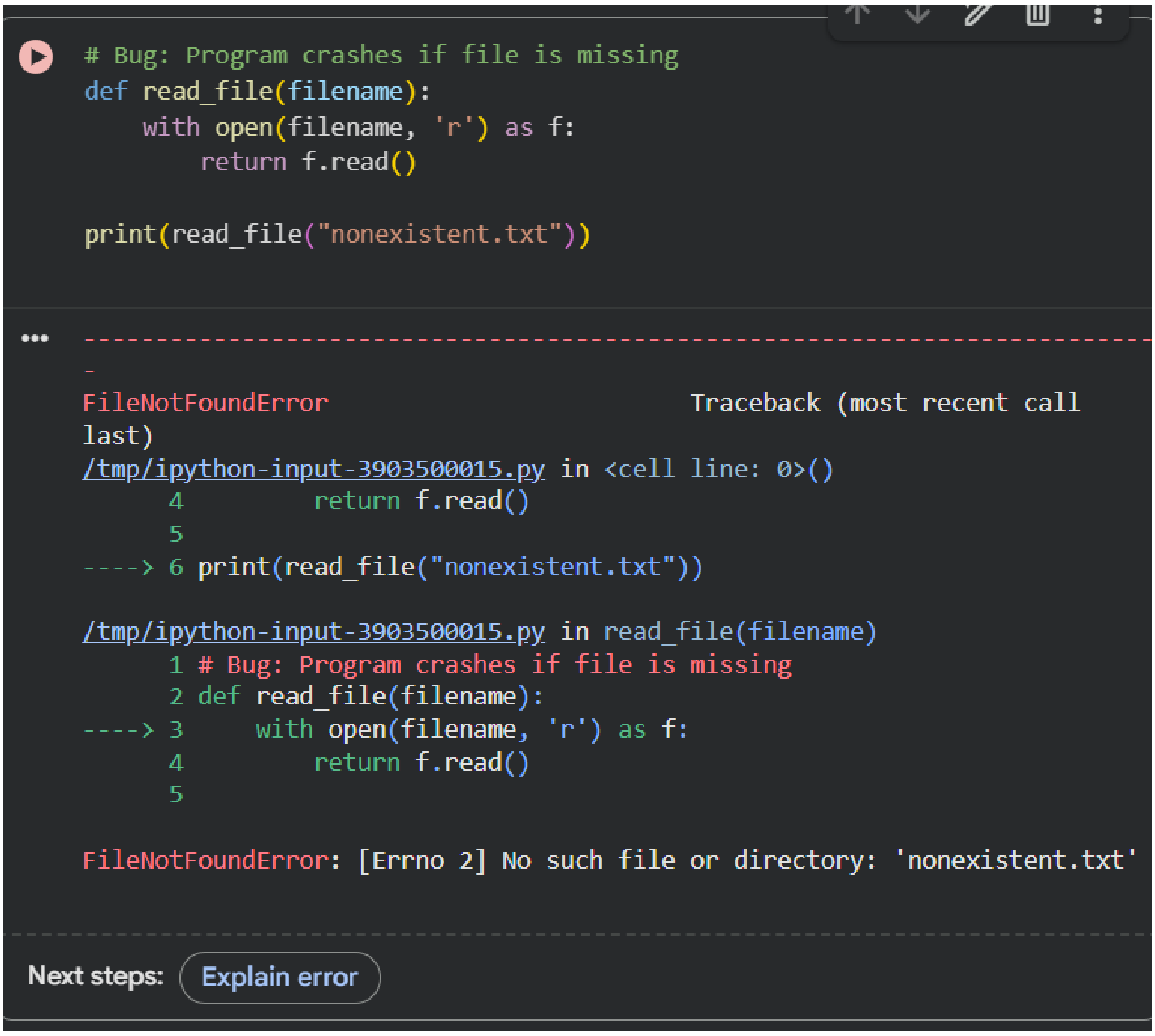
***AI Fix (Corrected Code)  :***



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

***Task 3: Runtime Error – File Not Found***

***Buggy Code***



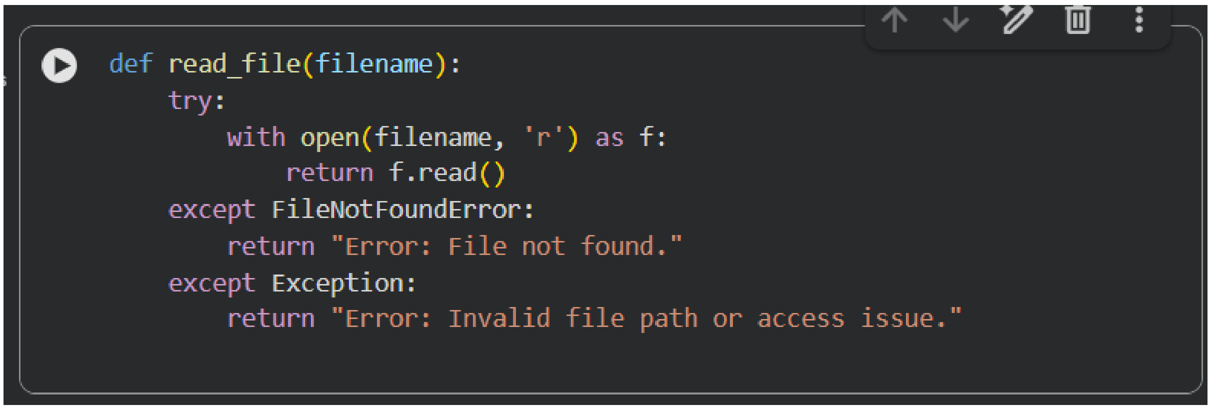
```
# Bug: Program crashes if file is missing
def read_file(filename):
    with open(filename, 'r') as f:
        return f.read()

print(read_file("nonexistent.txt"))
```

```
---------------------------------------------------------------------------
FileNotFoundError                         Traceback (most recent call last)
/tmp/ipython-input-3903500015.py in <cell line: 0>()
      4         return f.read()
      5 
----> 6 print(read_file("nonexistent.txt"))

/tmp/ipython-input-3903500015.py in read_file(filename)
      1 # Bug: Program crashes if file is missing
      2 def read_file(filename):
----> 3     with open(filename, 'r') as f:
      4         return f.read()
      5 

FileNotFoundError: [Errno 2] No such file or directory: 'nonexistent.txt'
```

***Observed Error***

- ***FileNotFoundError occurs when file does not exist.***

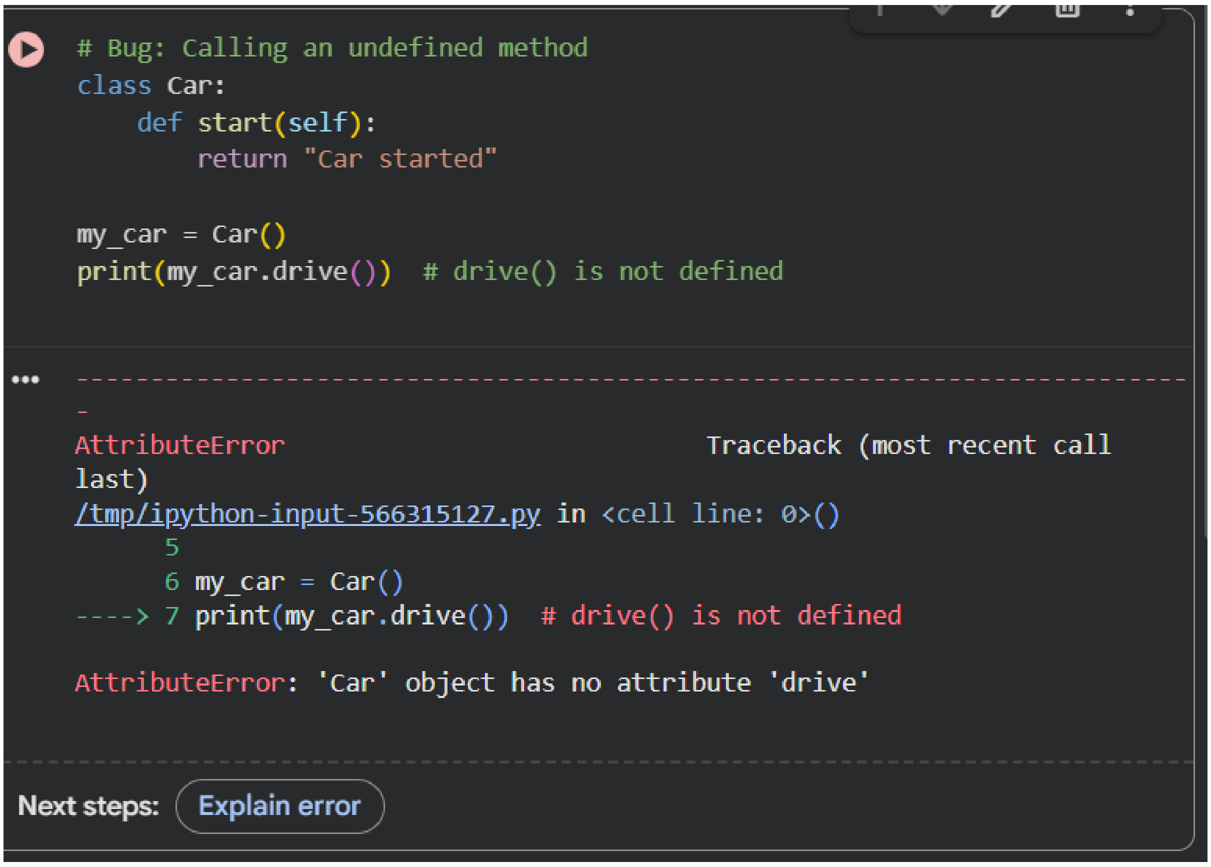
***AI Fix (Safe Code with Try-Except):***



```
def read_file(filename):
    try:
        with open(filename, 'r') as f:
            return f.read()
    except FileNotFoundError:
        return "Error: File not found."
    except Exception:
        return "Error: Invalid file path or access issue."
```

***Task 4: Calling a Non-Existent Method***

***Buggy Code:***



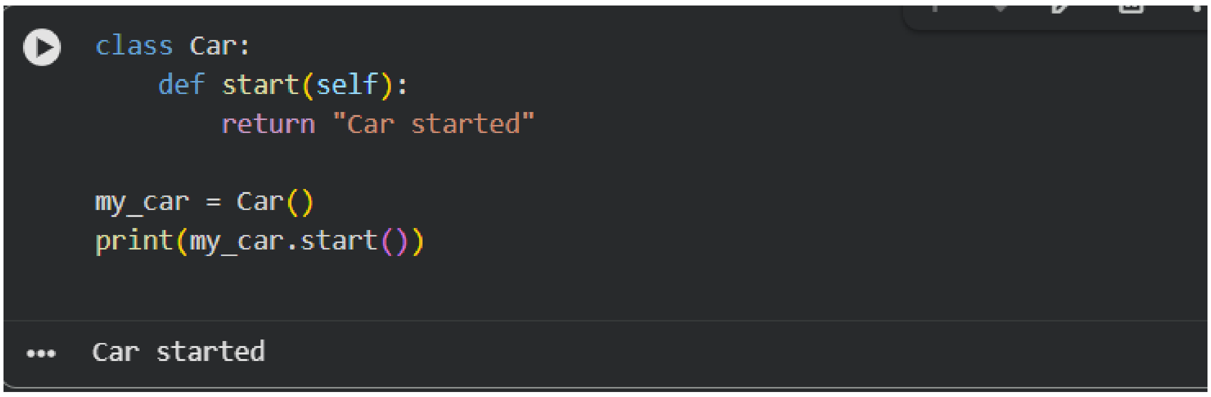
```
# Bug: Calling an undefined method
class Car:
    def start(self):
        return "Car started"

my_car = Car()
print(my_car.drive())  # drive() is not defined
```

```
---------------------------------------------------------------------------
-
AttributeError                            Traceback (most recent call
last)
/tmp/ipython-input-566315127.py in <cell line: 0>()
      5
      6 my_car = Car()
----> 7 print(my_car.drive())  # drive() is not defined

AttributeError: 'Car' object has no attribute 'drive'
```

***Problem***

- ***drive() method does not exist, so AttributeError occurs.***

***AI Fix :Correct the Method Call:***

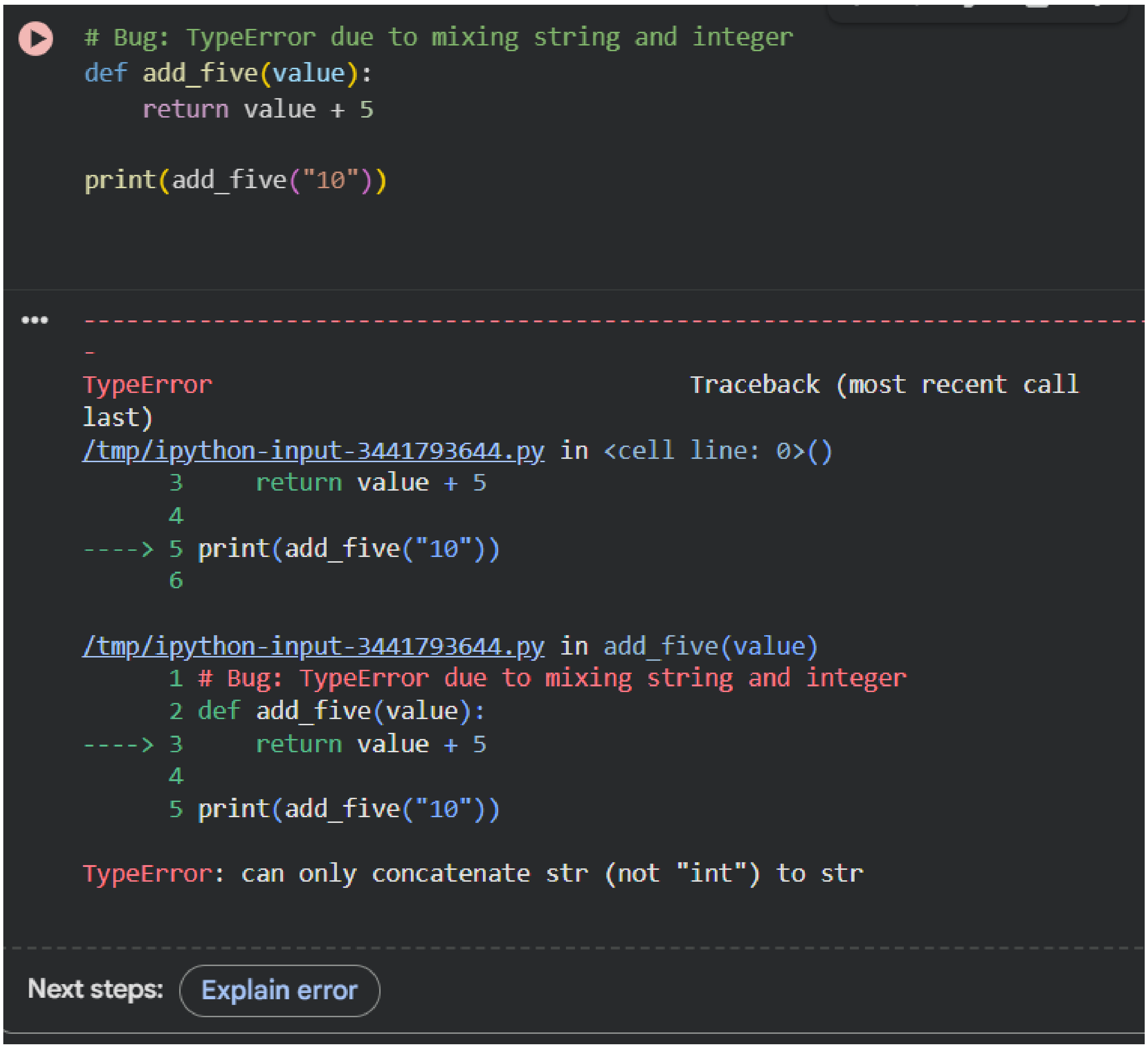


```
class Car:
    def start(self):
        return "Car started"

my_car = Car()
print(my_car.start())
```

```
Car started
```

***Task 5: TypeError – Mixing Strings and Integers in Addition***

***Buggy Code:***



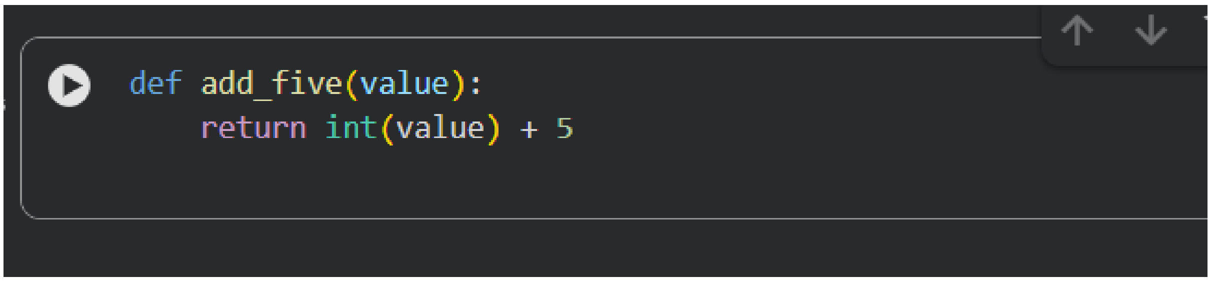
```
# Bug: TypeError due to mixing string and integer
def add_five(value):
    return value + 5

print(add_five("10"))
```

```
---------------------------------------------------------------------------
-
TypeError                                 Traceback (most recent call
last)
/tmp/ipython-input-3441793644.py in <cell line: 0>()
      3     return value + 5
      4
----> 5 print(add_five("10"))
      6

/tmp/ipython-input-3441793644.py in add_five(value)
      1 # Bug: TypeError due to mixing string and integer
      2 def add_five(value):
----> 3     return value + 5
      4
      5 print(add_five("10"))

TypeError: can only concatenate str (not "int") to str
```

***Observed Error***

- ***TypeError occurs because "10" is a string and cannot be added to integer 5.***

***AI Correction: String Concatenation:***



```
def add_five(value):
    return int(value) + 5
```

***Final Conclusion***

***This lab demonstrated how AI tools help in debugging different types of errors:***

- ***Syntax Errors (missing parentheses, indentation)***
- ***Logic Errors (wrong operators in conditions)***
- ***Runtime Errors (missing files, invalid paths)***
- ***Attribute Errors (undefined method calls)***
- ***Type Errors (mixing incompatible data types)***

***AI-assisted debugging improves productivity, but human understanding is necessary to validate fixes and write reliable code.***