

AI Assisted Coding

Assignment -7.1

Name: G.Vignesh

HT NO: 2303A52359

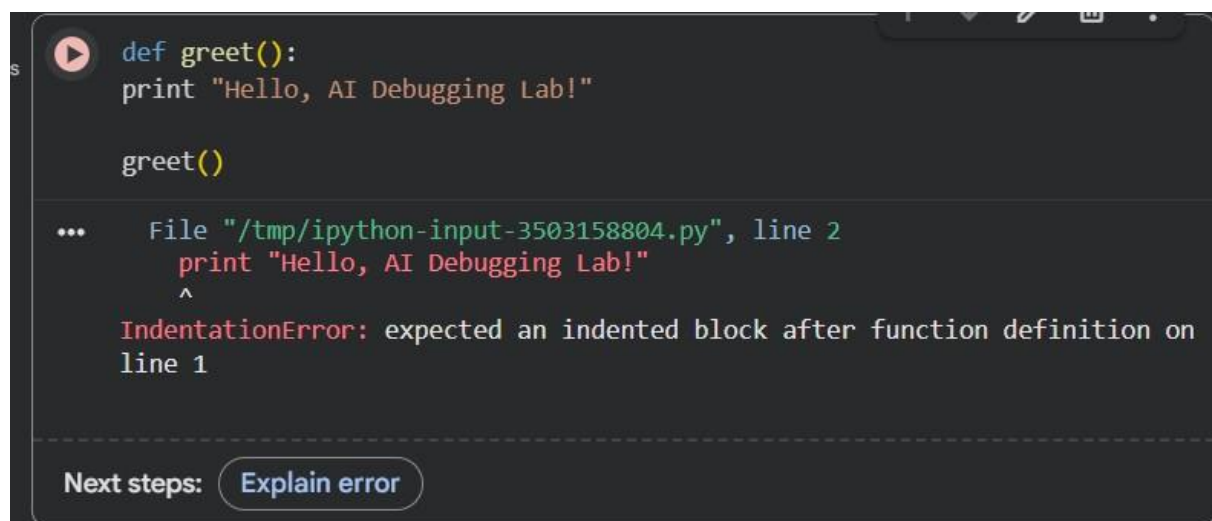
Batch: 36

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()
```

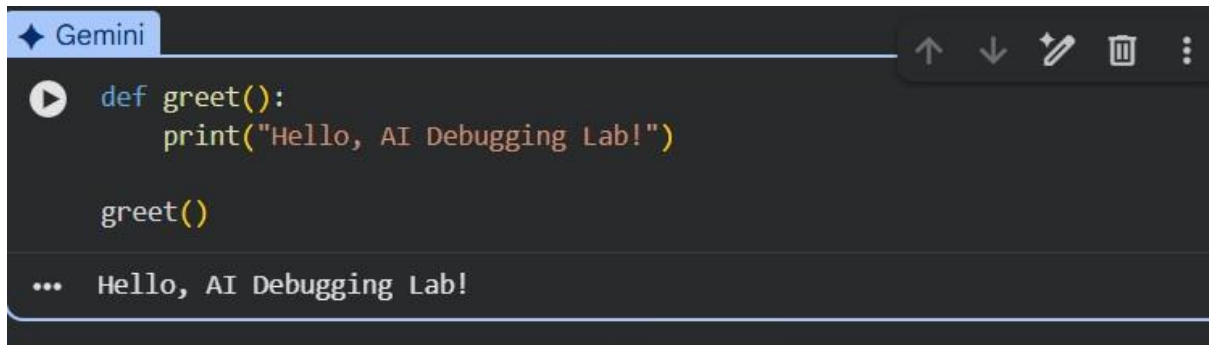
... File "/tmp/ipython-input-3503158804.py", line 2
 print "Hello, AI Debugging Lab!"
 ^
IndentationError: expected an indented block after function definition on line 1

Next steps: [Explain error](#)

Observed Error

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

AI Fix (Corrected Code):



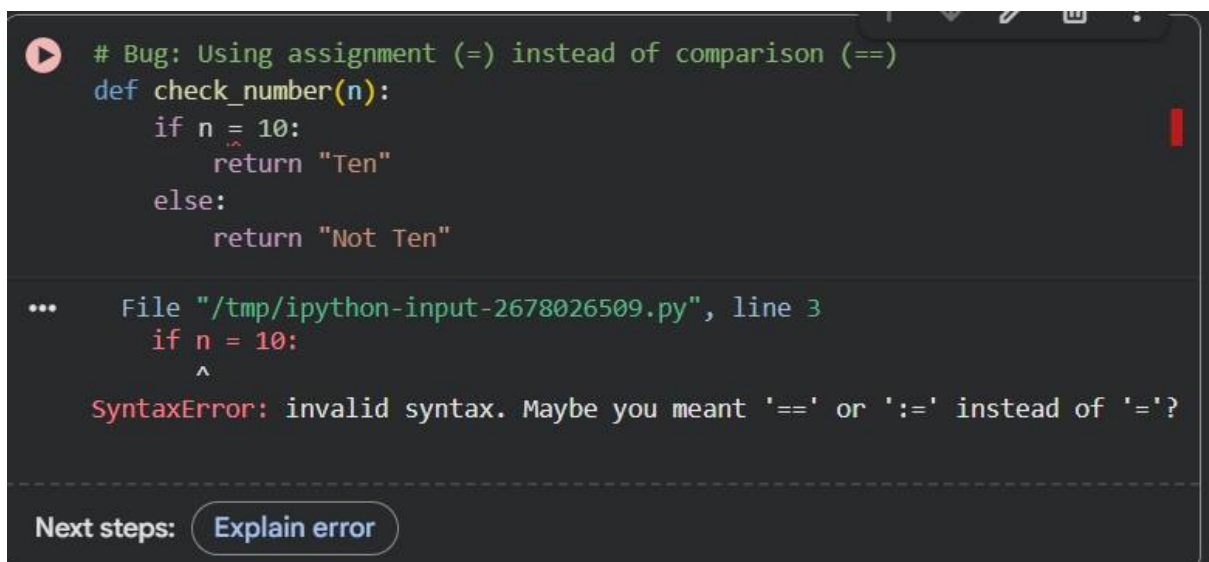
```
def greet():  
    print("Hello, AI Debugging Lab!")  
  
greet()  
... Hello, AI Debugging Lab!
```

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"
```

+ Code + Text

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'
```

Next steps: [Explain error](#)

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'
```

Next steps: [Explain error](#)

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"))

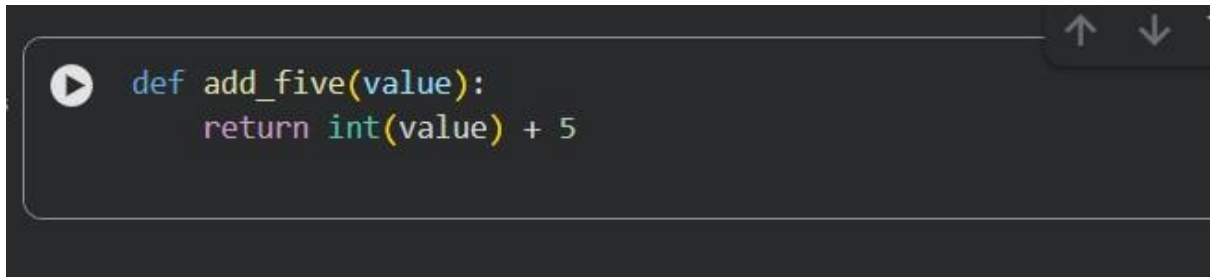
TypeError: can only concatenate str (not "int") to str

Next steps: Explain error
```

Observed Error

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

AI Correction: String Concatenation:

A dark-themed code editor window. On the left, there is a play button icon. The code is written in a light blue font. On the right side of the editor, there are two small, light blue icons: an upward-pointing arrow and a downward-pointing arrow.

```
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.