Lab Assignment 7.4

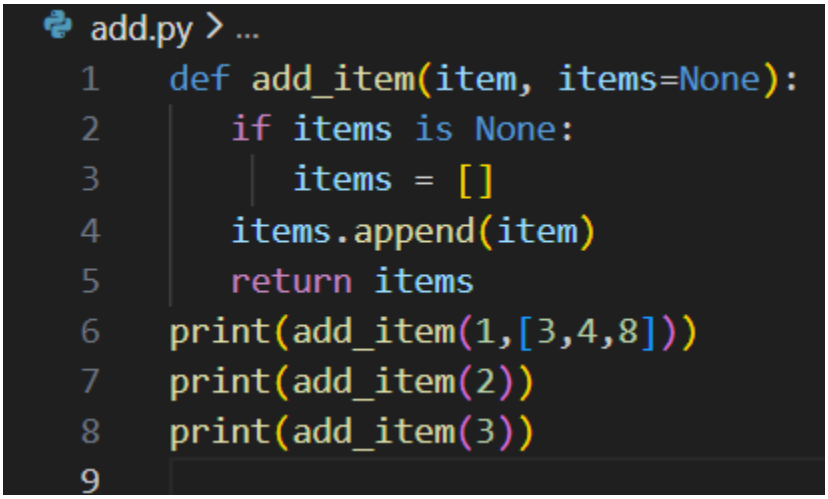
1. (Mutable Default Argument – Function Bug)

Task:

Analyze given code where a mutable default argument causes unexpected behavior. Use AI to fix it.

```
# Bug: Mutable default argument
def add_item(item, items= []):
    items.append(item)
    return items
print(add_item(1))
print(add_item(2))
```

Expected Output: Corrected function avoids shared list bug.



2. (Floating-Point Precision Error)

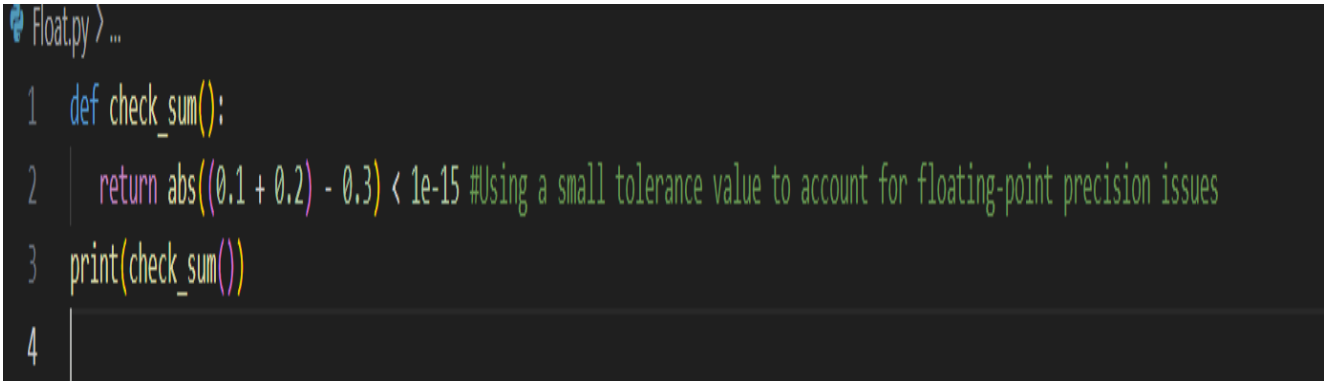
Task:

Analyze given code where floating-point comparison fails.

Use AI to correct with tolerance.

```
# Bug: Floating point precision issue
def check_sum():
    return (0.1 + 0.2) == 0.3
print(check_sum())
```

Expected Output: Corrected function



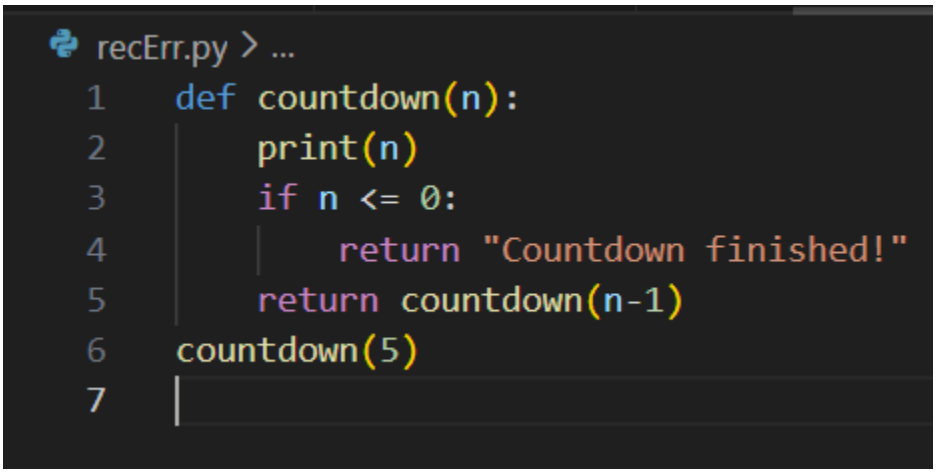
3. (Recursion Error – Missing Base Case)

Task:

Analyze given code where recursion runs infinitely due to missing base case. Use AI to fix it.

```
# Bug: No base case
def countdown(n):
    print(n)
    return countdown(n-1)
countdown(5)
```

Expected Output: Correct recursion with stopping condition.



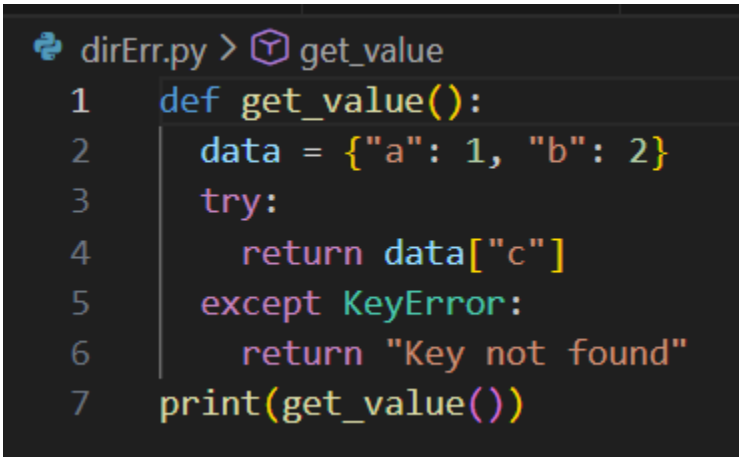
4. (Dictionary Key Error)

Task:

Analyze given code where a missing dictionary key causes error. Use AI to fix it.

```
# Bug: Accessing non-existing key
def get_value():
    data = {"a": 1, "b": 2}
    return data["c"]
print(get_value())
```

Expected Output: Corrected with .get() or error handling.

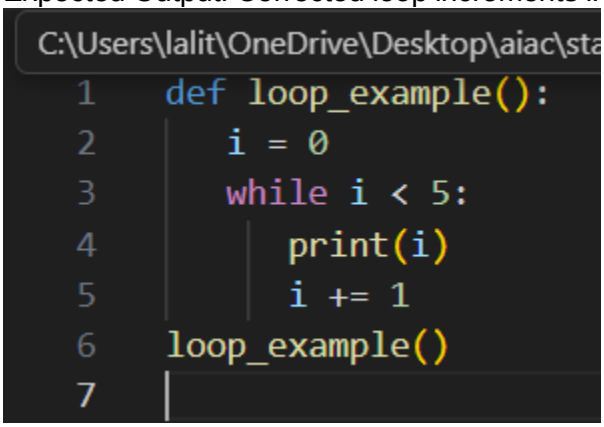


5. (Infinite Loop – Wrong Condition)

Task: Analyze given code where loop never ends. Use AI to detect and fix it.

```
# Bug: Infinite loop
def loop_example():
    i = 0
    while i < 5:
        print(i)
```

Expected Output: Corrected loop increments i.



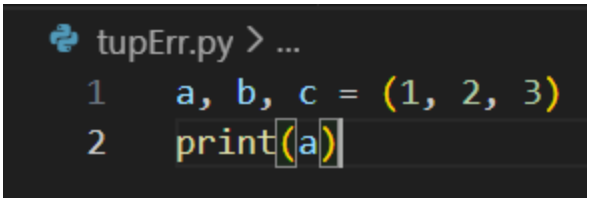
6. (Unpacking Error – Wrong Variables)

Task:

Analyze given code where tuple unpacking fails. Use AI to fix it.

```
# Bug: Wrong unpacking
a, b = (1, 2, 3)
```

Expected Output: Correct unpacking or using _ for extra values.



7. (Mixed Indentation – Tabs vs Spaces)

Task: Analyze given code where mixed indentation breaks execution. Use AI to fix it.

```
# Bug: Mixed indentation
def func():
    x = 5
    y = 10
    return x+y
```

Expected Output : Consistent indentation applied.

idenErr.py > func

```
1    def func():
2        x = 5
3        y = 10
4        return x+y
5    print(func())
```

8. (Import Error – Wrong Module Usage)

Task:

Analyze given code with incorrect import. Use AI to fix.

```
# Bug: Wrong import
import maths
print(maths.sqrt(16))
```

Expected Output: Corrected to import math

impErr.py

```
1    import math
2    print(math.sqrt(16))
```

9. (Unreachable Code – Return Inside Loop)

Task:

Analyze given code where a return inside a loop prevents full iteration. Use AI to fix it.

```
# Bug: Early return inside loop
def total(numbers):
    for n in numbers:
        return n
print(total([1,2,3]))
```

Expected Output: Corrected code accumulates sum and returns after loop.

sumErr.py > ...

```
1    def total(numbers):
2        total = 0
3        for n in numbers:
4            total += n
5        return total
6    print(total([1,2,3]))
```

10. (Name Error – Undefined Variable)

Task:

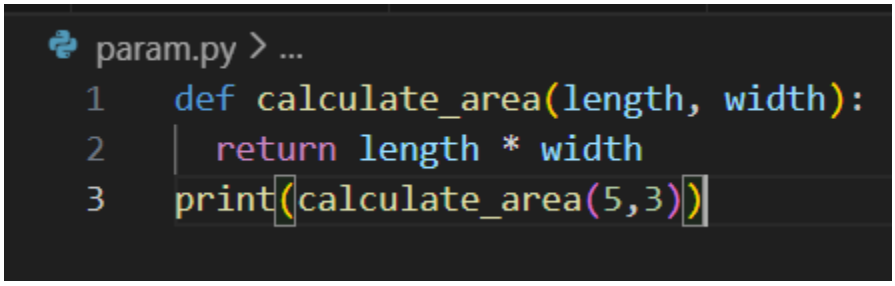
Analyze given code where a variable is used before being defined. Let AI detect and fix the error.

```
# Bug: Using undefined variable
def calculate_area():
    return length * width
print(calculate_area())
```

Requirements:

- Run the code to observe the error.
- Ask AI to identify the missing variable definition.
- Fix the bug by defining length and width as parameters.
- Add 3 assert test cases for correctness.

Expected Output :



11. (Type Error – Mixing Data Types Incorrectly)

Task:

Analyze given code where integers and strings are added incorrectly. Let AI detect and fix the error.

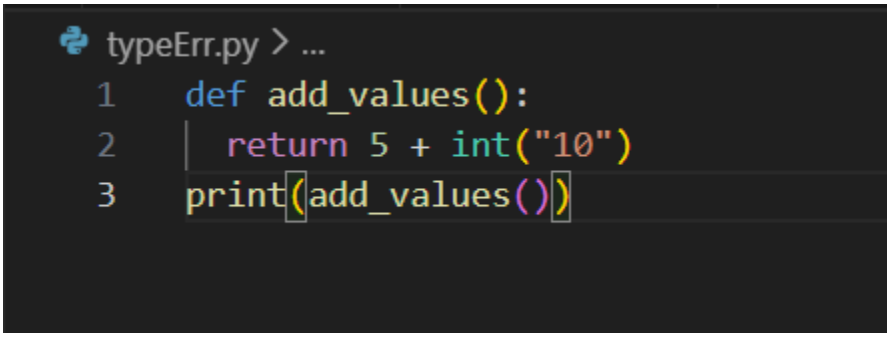
```
# Bug: Adding integer and string
def add_values():
    return 5 + "10"
print(add_values())
```

Requirements:

- Run the code to observe the error.
- AI should explain why int + str is invalid.
- Fix the code by type conversion (e.g., int("10") or str(5)).
- Verify with 3 assert cases.

Expected Output #6:

- Corrected code with type handling.
- AI explanation of the fix.
- Successful test validation.



Explanation:

TypeError because of the different data types one should be converted

12. (Type Error – String + List Concatenation)

Task:

Analyze code where a string is incorrectly added to

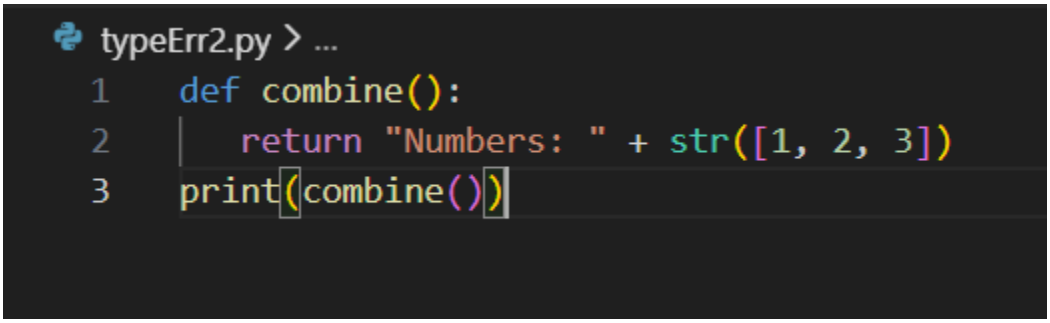
```
# Bug: Adding string and list
def combine():

    return "Numbers: " + [1, 2, 3]
print(combine())
```

Requirements:

- Run the code to observe the error.
- Explain why str + list is invalid.
- Fix using conversion (str([1,2,3]) or " ".join()).
- Verify with 3 assert cases.

Expected Output:

- Corrected code
- Explanation
- Successful test validation



Explanation:

String and list cannot be concatenated together it should be explicitly changed

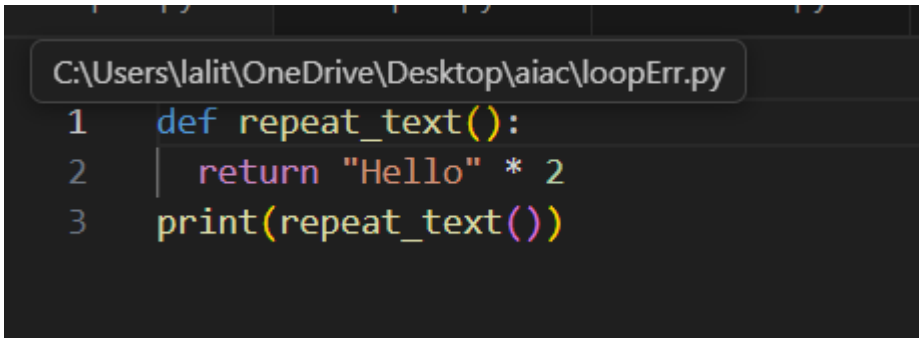
13. (Type Error – Multiplying String by Float)

Task: Detect and fix code where a string is multiplied by a float.

```
# Bug: Multiplying string by float
def repeat_text():
    return "Hello" * 2.5
print(repeat_text())
```

Requirements:

- Observe the error.
- Explain why float multiplication is invalid for strings.
- Fix by converting float to int.
- Add 3 assert test cases



Explanation:

String repetition requires an integer count. Always convert floats explicitly using int() or round() based on your intent—never rely on implicit conversion.

Task 14 (Type Error – Adding None to Integer)

Task: Analyze code where None is added to an integer.

Bug: Adding None and integer

def compute():

value = None
return value + 10
print(compute())
Requirements:
• Run and identify the error.
• Explain why NoneType cannot be added.
• Fix by assigning a default value.
• Validate using asserts.

typeErr4.py > ...

```
1  def compute(value):
2      return value + 10
3  print(compute(5))
```

Task 15 (Type Error – Input Treated as String Instead of Number)
Task: Fix code where user input is not converted properly.
# Bug: Input remains string
def sum_two_numbers():
a = input("Enter first number: ")
b = input("Enter second number: ")
return a + b
print(sum_two_numbers())
Requirements:
• Explain why input is always string.
• Fix using int() conversion.
• Verify with assert test cases.

typeErr5.py > ...

```
1  def sum_two_numbers():
2      a = input("Enter first number: ")
3      b = input("Enter second number: ")
4      return int(a) + int(b)
5  print(sum_two_numbers())
```