

AI Assisted Coding

Assignment – 7.4

Name: G.Srija

H.NO:2303A51671

Batch:23

Task 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.

Code:

```
def add_item_fixed(item, items=None):  
    if items is None:  
        items = []  
    items.append(item)  
    return items  
  
print(add_item_fixed(1))  
print(add_item_fixed(2))
```

Output: [1]

[2]

Task 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

Code:

```
def check_sum():
    return abs((0.1 + 0.2) - 0.3) < 1e-9
```

Output :

True

Task 3: (Recursion Error – Missing Base Case)

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

Bug: No base case

```
def countdown(n):
    print(n)
    return countdown(n-1)
countdown(5)
```

Expected Output : Correct recursion with stopping condition

Code:

```
def countdown(n):
```

```
if n == 0:  
    return  
    print(n)  
return countdown(n-1)  
  
countdown(5)
```

Output :

```
5  
4  
3  
2  
1
```

Task 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

Code:

```
def get_value():  
    data = {"a": 1, "b": 2}  
    return data.get("c", "Key not found")  
print(get_value())
```

output:

Key not found

Task 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.

Code:

```
def loop_example():
```

```
    i = 0
```

```
    while i < 5:
```

```
        print(i)
```

```
        i+=1
```

Output:

1

2

3

4

5

Task 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

Code :

```
a, b, c = (1, 2, 3)
```

```
print(a, b, c)
```

Output :

```
1 2 3
```

Task 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
```

Code:

```
def func():
```

```
    x = 5
```

```
    y = 10
```

```
    return x + y
```

```
print(func())
```

Output : 15

Task 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

Code :

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

output :

4.0

Task 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.

Code :

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

Output : 6

Task 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.

Code :

```
def calculate_area(length, width):  
    return length * width  
print(calculate_area(5, 10))  
print(calculate_area(7, 3))  
print(calculate_area(4, 6))
```

Output :

```
50  
21  
24
```

Task 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.

Code:

```
def add_values():
    return 5 + int("10")
print(add_values())
```

OUTPUT :

15

Task 12 (Type Error – String + List Concatenation)

Task: Analyze code where a string is incorrectly added to a list.

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

Code:

```
def combine():

    numbers = [1, 2, 3]

    #Fix using conversion (str([1,2,3]) or " ".join()).

    return "Numbers: " + " ".join(map(str, numbers))

print(combine())

#use 3 assert test cases

assert combine() == "Numbers: 1 2 3"

assert "1" in combine()

assert "3" in combine()
```

OUTPUT:

Numbers: 1 2 3

Task 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.

Code:

```
def repeat_text():

    #fix Multiplying string by float
```

```

# Convert float to integer for string multiplication
multiplier = int(2.5)

return "Hello" * multiplier

print(repeat_text())

#Add 3 assert test cases.

assert repeat_text() == "HelloHello"

assert len(repeat_text()) == 10

assert repeat_text().count("Hello") == 2

```

Output :

HelloHello

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.

Code:

```

def compute():

    # fix Adding None and integer

    value = None

    return value + 10 if value is not None else 10

```

```
print(compute())
```

OUTPUT :

10

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.

Code:

```
def sum_two_numbers():
    a = input("Enter first number: ")
    b = input("Enter second number: ")
    # Convert the input strings to integers and return their sum
    return int(a) + int(b)
print(sum_two_numbers())
```

OUTPUT:

Enter first number: 5

Enter second number: 6