

# AI Assisted Coding

## Assignment 7.5

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### Task 1:

#### Prompt:

#Bug: Mutable default argument

#Fix the bug in the above code

#### Code & Output:

```
assignment_7.5.py X #Task-1 : (Mutable Default Argument – Fu Untitled-1
assignment_7.5.py > ...
1  # Bug: Mutable default argument
2  def add_item(item, items=[ ]):
3      items.append(item)
4      return items
5
6  print(add_item(1))
7  print(add_item(2))
8
9  # Fix the bug in the above code
10 def add_item(item, items=None):
11     if items is None:
12         items = []
13     items.append(item)
14     return items
15
16 print(add_item(1))
17 print(add_item(2))
18
```

PROBLEMS OUTPUT TERMINAL PORTS

> < TERMINAL

PS C:\Users\hariv\OneDrive\Documents\SRU\3 year II sem\AI\_Assistant\_coding> & C:/Users/hariv/AppData/Local/Microsoft/WindowsApps/python3.12.exe "c:/Users/hariv/OneDrive/Documents/SRU/3 year II sem/AI\_Assistant\_coding/assignment\_7.5.py"
[1]
[1, 2]
[1]
[2]
PS C:\Users\hariv\OneDrive\Documents\SRU\3 year II sem\AI\_Assistant\_coding>

#### Explanation:

The AI correctly recognized that using a mutable object like a list as a default argument causes the same list to be shared across multiple function calls, leading to unexpected value accumulation. In the corrected version, the AI initializes the list inside the function when no argument is passed, ensuring a new list is created each time. This method avoids unwanted side effects and follows recommended best practices for designing Python functions.

## Task 2: Floating-Point Precision Error

### Prompt:

#Bug: Floating point precision issue

#Fix the above code

### Code & Output:

The screenshot shows a code editor window with two tabs: 'assignment\_7.5.py' and '#Task-1 : (Mutable Default Argument – Fu Untitled-1)'. The code in 'assignment\_7.5.py' contains the following Python script:

```
assignment_7.5.py > ...
1 # Bug: Floating point precision issue
2 def check_sum():
3     return (0.1 + 0.2) == 0.3
4
5 print(check_sum())
6
7 # Fix the above code
8 def check_sum():
9     return abs((0.1 + 0.2) - 0.3) < 1e-9
10
11 print(check_sum())
12
```

Below the code editor is a terminal window titled 'TERMINAL'. It shows the command 'python3.12.exe "c:/Users/hariv/OneDrive/Documents/SRU/3 year II sem/AI\_Assistant\_coding/assignment\_7.5.py"' being run. The terminal output displays:

```
PS C:\Users\hariv\OneDrive\Documents\SRU\3 year II sem\AI_Assistant_coding> & C:/Users/hariv/AppData/Local/Microsoft/WindowsApps/python3.12.exe "c:/Users/hariv/OneDrive/Documents/SRU/3 year II sem/AI_Assistant_coding/assignment_7.5.py"
● False
True
○ PS C:\Users\hariv\OneDrive\Documents\SRU\3 year II sem\AI_Assistant_coding>
```

### Explanation:

The AI recognized that floating-point values cannot always be compared directly because of precision issues in their binary representation. Rather than relying on exact equality, it recommended comparing the difference between the values within a small acceptable range. This approach makes numerical calculations more accurate and reliable.

## Task 3: Recursion Error – Missing Base Case

### Prompt:

#This code will cause a RecursionError: maximum recursion depth exceeded in comparison

#Fixed Code:

### Code & Output:

The screenshot shows a code editor interface with two tabs: 'assignment\_7.5.py' and '#Task-1 : (Mutable Default Argument – Fu Untitled-1)'. The 'assignment\_7.5.py' tab contains the following Python code:

```
1 # def countdown(n):
2 #     print(n)
3 #     return countdown(n - 1)
4 # countdown(5)
5 # This code will cause a RecursionError: maximum recursion depth exceeded in comparison
6
7 # Fixed code:
8 def countdown(n):
9     if n <= 0:
10         print("STOP!")
11     else:
12         print(n)
13         countdown(n - 1)
14
15 countdown(5)
16
```

The '#Task-1' tab is partially visible at the top right. Below the tabs is a toolbar with 'PROBLEMS', 'OUTPUT', 'TERMINAL', and 'PORTS' buttons. The 'TERMINAL' button is selected. The terminal window shows the command 'python3.12.exe "c:/Users/hariv/OneDrive/Documents/SRU/3 year II sem/AI\_Assistant\_coding/assignment\_7.5.py"' followed by the output:

```
PS C:\Users\hariv\OneDrive\Documents\SRU\3 year II sem\AI_Assistant_coding> & C:/Users/hariv/AppData/Local/Microsoft/WindowsApps/python3.12.exe "c:/Users/hariv/OneDrive/Documents/SRU/3 year II sem/AI_Assistant_coding/assignment_7.5.py"
5
4
3
2
1
STOP!
PS C:\Users\hariv\OneDrive\Documents\SRU\3 year II sem\AI_Assistant_coding>
```

### Explanation:

The AI noticed that the recursive function was missing a stopping condition, which led to infinite recursion and eventually a stack overflow. By introducing a proper base case, the AI made sure the recursion ends at the right point. This correction highlights how essential exit conditions are when designing recursive algorithms.

### Task 4: Dictionary Key Error

#### Prompt:

#Fixed Code:

#Bug: Accessing non-existing key

#### Code & Output:

The screenshot shows a code editor interface with two tabs: 'assignment\_7.5.py' and '#Task-1 : (Mutable Default Argument – Fu Untitled-1)'. The code in 'assignment\_7.5.py' is as follows:

```
1 # def get_value():
2 #     data = {"a": 1, "b": 2}
3 #     return data["c"]
4 # print(get_value())
5 # This code will cause a KeyError
6
7 # Fixed code:
8 # Bug: Accessing non-existing key
9 def get_value():
10     data = {"a": 1, "b": 2}
11     return data.get("c", "Key not found")
12
13 print(get_value())
14
```

The terminal tab shows the following output:

```
> TERMINAL
PS C:\Users\hariv\OneDrive\Documents\SRU\3 year II sem\AI_Assistant_coding> & C:/Users/hariv/AppData/Local/Microsoft/WindowsApps/python3.12.exe "c:/Users/hariv/OneDrive/Documents/SRU/3 year II sem/AI_Assistant_coding/assignment_7.5.py"
Key not found
PS C:\Users\hariv\OneDrive\Documents\SRU\3 year II sem\AI_Assistant_coding>
```

### Explanation:

The AI understood that trying to access a dictionary key that does not exist results in a **KeyError**. It recommended safer approaches like using the `.get()` method or properly handling the exception. These alternatives make the program more robust and help avoid unexpected crashes during execution.

### Task 5: Infinite Loop – Wrong Condition

#### Prompt:

#Bug: Infinite loop because 'i' is never incremented.

#Fixed Code:

#### Code & Output:

The screenshot shows a code editor interface with two tabs: 'assignment\_7.5.py' and '#Task-1 : (Mutable Default Argument – Fu Untitled-1)'. The code in 'assignment\_7.5.py' contains a bug where the loop variable 'i' is never incremented, resulting in an infinite loop. The AI has suggested a fix where 'i' is incremented by 1 in each iteration. The terminal output shows the corrected code running successfully, printing the numbers 0 through 4.

```
# assignment_7.5.py > ...
# Task-1 : (Mutable Default Argument – Fu Untitled-1) ●

assignment_7.5.py > ...
1 # def loop_example():
2 #     i = 0
3 #     while i < 5:
4 #         print(i)
5 # Bug: Infinite loop because 'i' is never incremented.
6
7 # Fixed code:
8 def loop_example():
9     i = 0
10    while i < 5:
11        print(i)
12        i += 1
13
14 loop_example()
15

PROBLEMS OUTPUT TERMINAL PORTS
> ▾ TERMINAL
PS C:\Users\hariv\OneDrive\Documents\SRU\3 year II sem\AI_Assistant_coding> & C:/Users/hariv/AppData/Local/Microsoft/WindowsApps/python3.12.exe "c:/Users/hariv/OneDrive/Documents/SRU/3 year II sem/AI_Assistant_coding/assignment_7.5.py"
0
1
2
3
4
PS C:\Users\hariv\OneDrive\Documents\SRU\3 year II sem\AI_Assistant_coding>
```

### Explanation:

The AI detected that the loop variable was not being updated, which resulted in an infinite loop. By adding the appropriate increment step, the loop now moves steadily toward its termination condition. This correction emphasizes how crucial it is to update loop control variables properly.

## Task 6: Unpacking Error – Wrong Variables

### Prompt:

#Bug: Wrong unpacking

#Fix : Change to correct unpacking

### Code & Output:

The screenshot shows a code editor interface with two tabs: 'assignment\_7.5.py' and '#Task-1 : (Mutable Default Argument – Fu Untitled-1)'. The code in 'assignment\_7.5.py' contains a bug where the variables 'a', 'b', and 'c' are assigned values (1, 2, 3) instead of being unpacked from a tuple. The AI has suggested a fix where the variables are correctly unpacked from the tuple. The terminal output shows the corrected code running successfully, printing the values 1, 2, 3.

```
# assignment_7.5.py > ...
# Task-1 : (Mutable Default Argument – Fu Untitled-1) ●

assignment_7.5.py > ...
1 # a, b = (1, 2, 3)
2 # Bug: Wrong unpacking
3 # Fix: Change to correct unpacking
4 a, b, c = (1, 2, 3)
5 print(a, b, c)
6

PROBLEMS OUTPUT TERMINAL PORTS
> ▾ TERMINAL
PS C:\Users\hariv\OneDrive\Documents\SRU\3 year II sem\AI_Assistant_coding> & C:/Users/hariv/AppData/Local/Microsoft/WindowsApps/python3.12.exe "c:/Users/hariv/OneDrive/Documents/SRU/3 year II sem/AI_Assistant_coding/assignment_7.5.py"
1 2 3
PS C:\Users\hariv\OneDrive\Documents\SRU\3 year II sem\AI_Assistant_coding>
```

### **Explanation:**

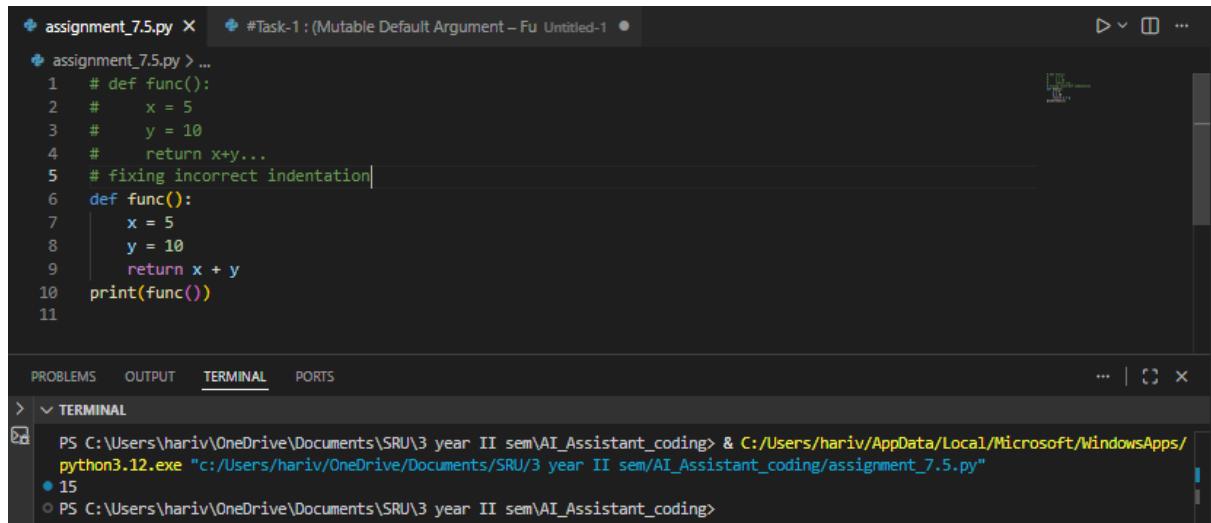
The AI identified that there was a mismatch between the number of variables and the values being unpacked from the tuple. It suggested fixing this either by adding more variables or by using a placeholder variable (\_) for values that are not needed. This approach allows the tuple to be unpacked correctly and avoids runtime errors.

### **Task 7: Mixed Indentation – Tabs vs Spaces**

#### **Prompt:**

#Fixing incorrect indentation

#### **Code & Output:**



A screenshot of a code editor showing a file named `assignment_7.5.py`. The code contains a function definition with inconsistent indentation. The AI has suggested fixing the indentation. The terminal below shows the command `python3.12.exe "c:/Users/hariv/OneDrive/Documents/SRU/3 year II sem/AI_Assistant_coding/assignment_7.5.py"` and its output, which includes a syntax error message indicating a problem with the indentation.

```
assignment_7.5.py X #Task-1 : (Mutable Default Argument – Fu Untitled-1 ●
assignment_7.5.py > ...
1 # def func():
2 #     x = 5
3 #     y = 10
4 #     return x+y...
5 # fixing incorrect indentation|
6 def func():
7     x = 5
8     y = 10
9     return x + y
10 print(func())
11

PROBLEMS OUTPUT TERMINAL PORTS ... | ⚡ ×
> ▾ TERMINAL
PS C:\Users\hariv\OneDrive\Documents\SRU\3 year II sem\AI_Assistant_coding> & C:/Users/hariv/AppData/Local/Microsoft/WindowsApps/python3.12.exe "c:/Users/hariv/OneDrive/Documents/SRU/3 year II sem/AI_Assistant_coding/assignment_7.5.py"
● 15
○ PS C:\Users\hariv\OneDrive\Documents\SRU\3 year II sem\AI_Assistant_coding>
```

### **Explanation:**

The AI identified inconsistent indentation as the main reason for the error. Since Python depends heavily on indentation to define code blocks, the issue caused the program to fail. By fixing the spacing and making the indentation consistent throughout the function, the AI ensured proper execution and also improved the overall readability of the code.

### **Task 8: Import Error – Wrong Module Usage**

#### **Prompt:**

#Bug: Wrong import module name

#Corrected Code:

#### **Code & Output:**

The screenshot shows a code editor interface with two tabs: 'assignment\_7.5.py' and '#Task-1 : (Mutable Default Argument – Fu Untitled-1)'. The 'assignment\_7.5.py' tab contains the following Python code:

```
assignment_7.5.py
1 # import maths
2 # print(maths.sqrt(16))
3 # Bug: wrong import module name
4 # Corrected code:
5 import math
6 print(math.sqrt(16))
7
```

The 'TERMINAL' tab shows the command-line output of running the script:

```
PROBLEMS OUTPUT TERMINAL PORTS ... | ⚡ X
> ✓ TERMINAL
PS C:\Users\hariv\OneDrive\Documents\SRU\3 year II sem\AI_Assistant_coding> & C:/Users/hariv/AppData/Local/Microsoft/WindowsApps/python3.12.exe "c:/Users/hariv/OneDrive/Documents/SRU/3 year II sem/AI_Assistant_coding/assignment_7.5.py"
4.0
PS C:\Users\hariv\OneDrive\Documents\SRU\3 year II sem\AI_Assistant_coding>
```

### Explanation:

The AI realized that the module name being imported was incorrect. It recommended using the standard Python **math** module instead. This correction fixes the import error and enables the program to access mathematical functions properly.