

School of Computer Science and Artificial Intelligence

Lab Assignment # 7

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1 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.

Prompt:-

given python program corrected function avoid shared list bug

Code:-

```
#Task 1
# given python program corrected
def add_item(item, items=None):
    if items is None:
        items = []
    items.append(item)
    return items
print(add_item(1))
print(add_item(2))
```

Output:-

```
LAB/A
[1]
[2]
PS C:
```

Justification:

The function `add_item` is defined with a default parameter `items` that is a list. If the list is not provided, it is initialized as an empty list. The function appends the item to the list and returns the list.

2Task: 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

Prompt:-

fix the below python program using correct function with tolerance.

Code:-

```
# fix the below python program using correct
def check_sum():
    return abs((0.1 + 0.2) - 0.3) < 1e-10
print(check_sum())
```

Output:-

```
LAB/Ass
True
PS C:\A
```

Justification:-

The function check_sum() is used to check if the sum of 0.1 and 0.2 is equal to 0.3. The function returns True if the sum is equal to 0.3, otherwise it returns False.

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.

Prompt:-

fix the below python program using recursion with stopping condition.

Code:-

```
#Task 3
# fix the below python
def countdown(n):
    print(n)
    if n == 0:
        return
    countdown(n - 1)
countdown(5)
```

Output:-

```
PS C:\AI>
LAB/Assi:
5
4
3
2
1
0
PS C:\AI>
```

Justification:-

The function countdown is a recursive function that prints the numbers from n to 0. The stopping condition is when n is 0. The function is called with the initial value of n as 5. The function prints the value of n and then calls itself with the value of n minus 1. The function continues to call itself until the stopping condition is met.

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.

Prompt:-

fix the below python program using Corrected with .get() or error handling.

Code:-

```
#Task 4
# fix the below python program using Corrected with .get() or error handling
def get_value():
    data = {"a": 1, "b": 2, "c": 3}
    return data.get("c", "Key not found")
print(get_value())
```

Output:-

```
PS C:\AI>
LAB/Assi:
3
PS C:\AI>
```

Justification:

The program is corrected by using the .get() method to get the value of the key "c" from the dictionary. If the key is not found, it returns "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.

Prompt:-

fix the below python program using Corrected loop increments i.

Code:

```
#Task 5
# fix the below python
def loop_example():
    i = 0
    while i < 5:
        print(i)
        i += 1
loop_example()
```

Output:-

```
PS C:\LAB\A>
0
1
2
3
4
PS C:>
```

Justification:

The loop is incrementing i by 1 in each iteration so that the loop will terminate when i is equal to 5 and print the values of i from 0 to 4.

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.

Prompt:-

fix the below python program using Correct unpacking or using _ for extra values.

Code:-

```
#Task 6
# fix the below python code
a, b, _ = (1, 2, 3)
print(a, b)
```

Output:-

```
LAB/Ass
1 2
PS C:\A
```

Justification:

We used `_` for extra values to avoid the error of too many values to unpack and we used `a`, `b` for the first two values to print the values of `a` and `b`.

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
```

Expected Output : Consistent indentation applied.

Prompt:-

fix the below python program using Consistent Mixed Indentation.

Code:-

```
#Task 7
# fix the below python code
def func():
    x = 5
    y = 10
    return x + y
print(func())
```

Output:-

```
LAB/As
15
PS C:\A
```

Justification:

The function is correctly indented and the return statement is correctly indented and the code is correct and the output is correct.

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

Prompt:-

fix the below python program using Corrected to import math module.

Code:-

```
#Task 8
# fix the below python program using Corrected to i
import math as maths
print("The square root of 16 is:", maths.sqrt(16))
```

Output:-

```
C:\AIAC LAB\Assignments Codes>python task8.py
The square root of 16 is: 4.0
PS C:\AIAC LAB\Assignments Codes>
```

Justification:

The program is corrected to import the math module using the as keyword to avoid naming conflicts with the maths library and print the square root of 16.