# AI ASSISTED CODING

# LAB-10.4

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BATCH: 04

**TASK-01:**

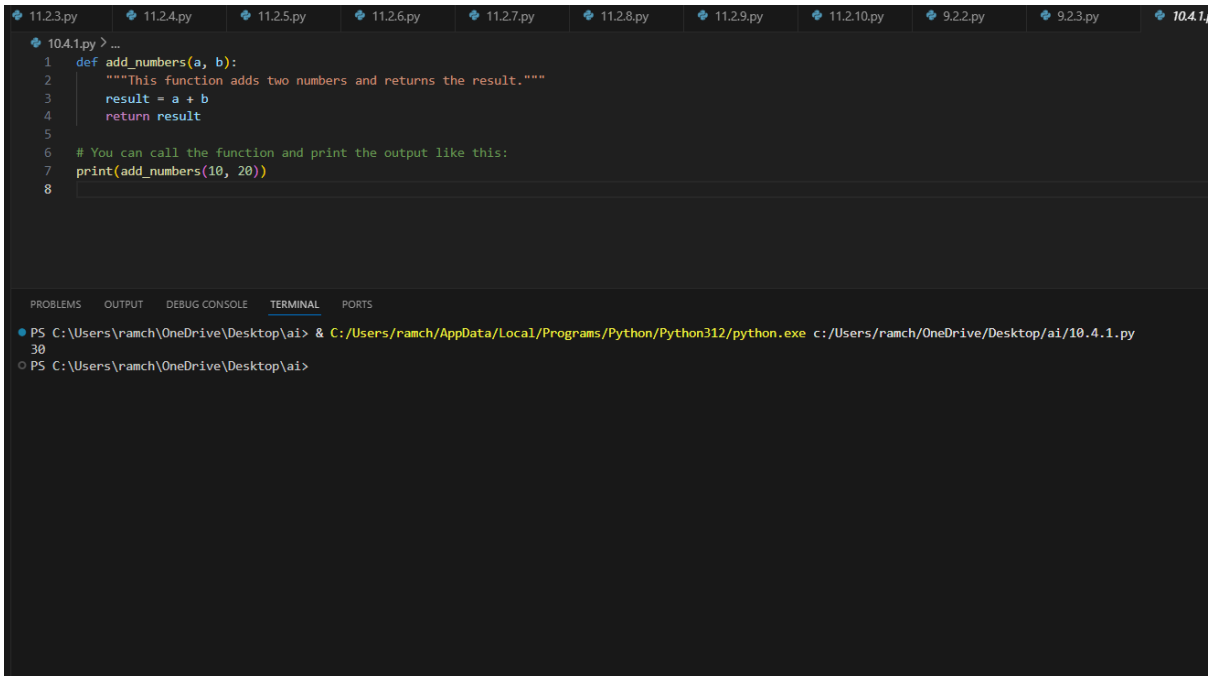
Identify and fix syntax, indentation, and variable errors in the given script.

```
# buggy_code_task1.py
def add_numbers(a, b)
result = a + b
return reslt
print(add_numbers(10 20))
```

**PROMPT:**

Identify the errors in the given code and give the corrected code.

**CODE & OUTPUT:**




**OBSERVATION:**

The ai corrected all the errors in the given code and make the code much more efficient to understand and it also gave the identation to the code.

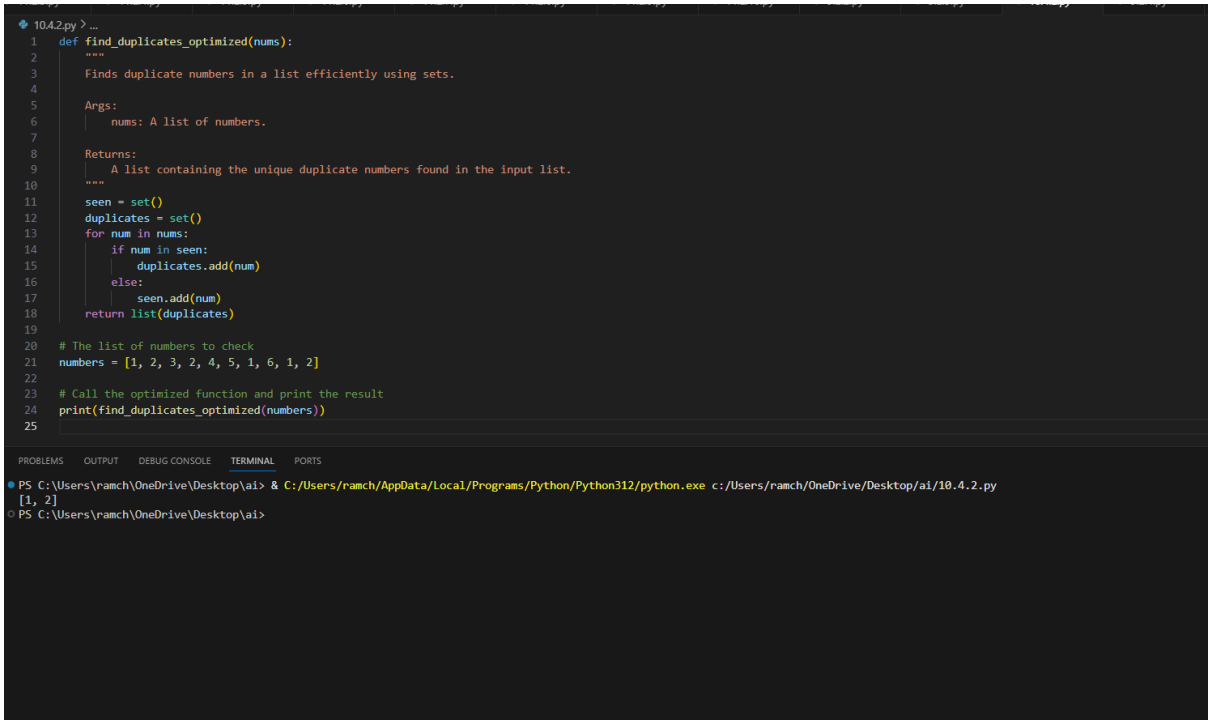
**TASK-02:**

Optimize inefficient logic while keeping the result correct.
# buggy_code_task2.py
def find_duplicates(nums):
duplicates = []
for i in range(len(nums)):
for j in range(len(nums)):
if i != j and nums[i] == nums[j] and nums[i] not in duplicates:
duplicates.append(nums[i])
return duplicates
numbers = [1,2,3,2,4,5,1,6,1,2]
print(find_duplicates(numbers))

**PROMPT:**

Correct the given code with the proper indentation and give the corrected code.

**CODE & OUTPUT:**




**OBSERVATION:**

The ai edited the code with proper indentation and also corrected all the errors and the code is finding the duplicate numbers efficiently.

**TASK-03:**

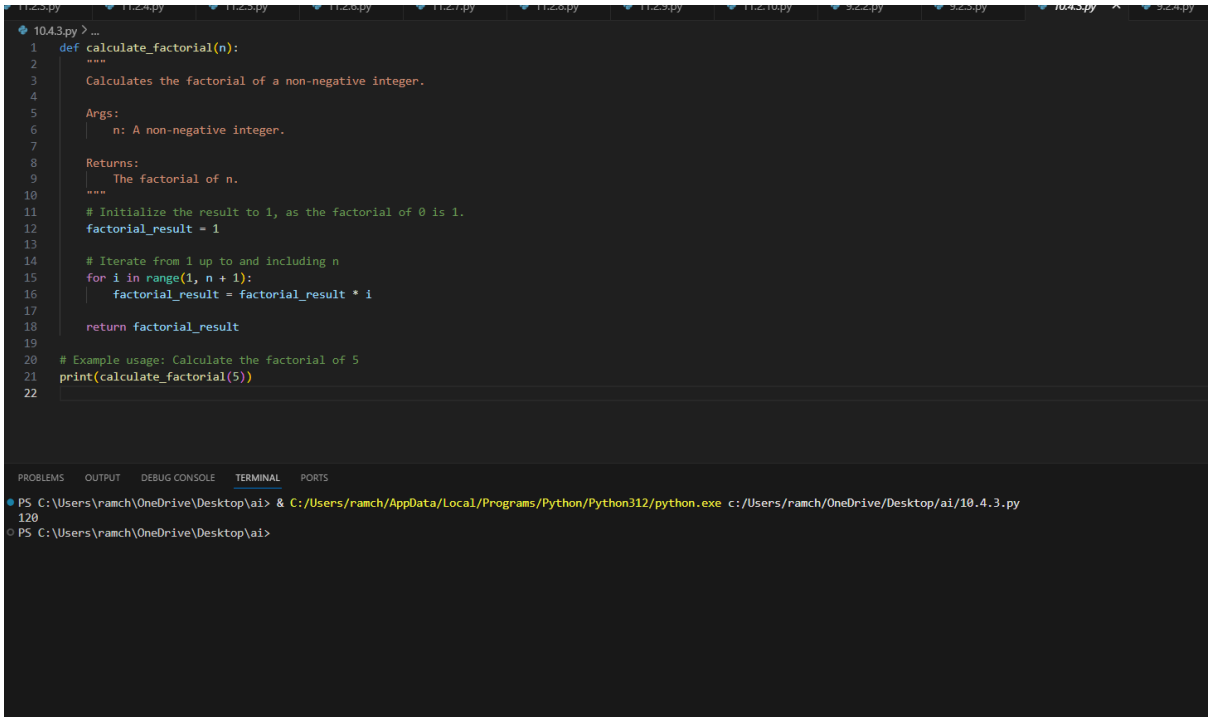
Refactor messy code into clean, PEP 8–compliant, well-structured code.

```
# buggy_code_task3.py

def c(n):
x=1
for i in range(1,n+1):
x=x*i
return x
print(c(5))
```

**PROMPT:**

rename the function name in the given code and correct code with correcting all the errors and also give the proper indentation.

**CODE & OUTPUT:**




**OBSERVATION:**

The code is corrected by the ai according to the prompt given by me in which I have mentioned that update the function name and correct the errors and give the proper indentation.

**TASK-04:**

Add security practices and exception handling to the code.

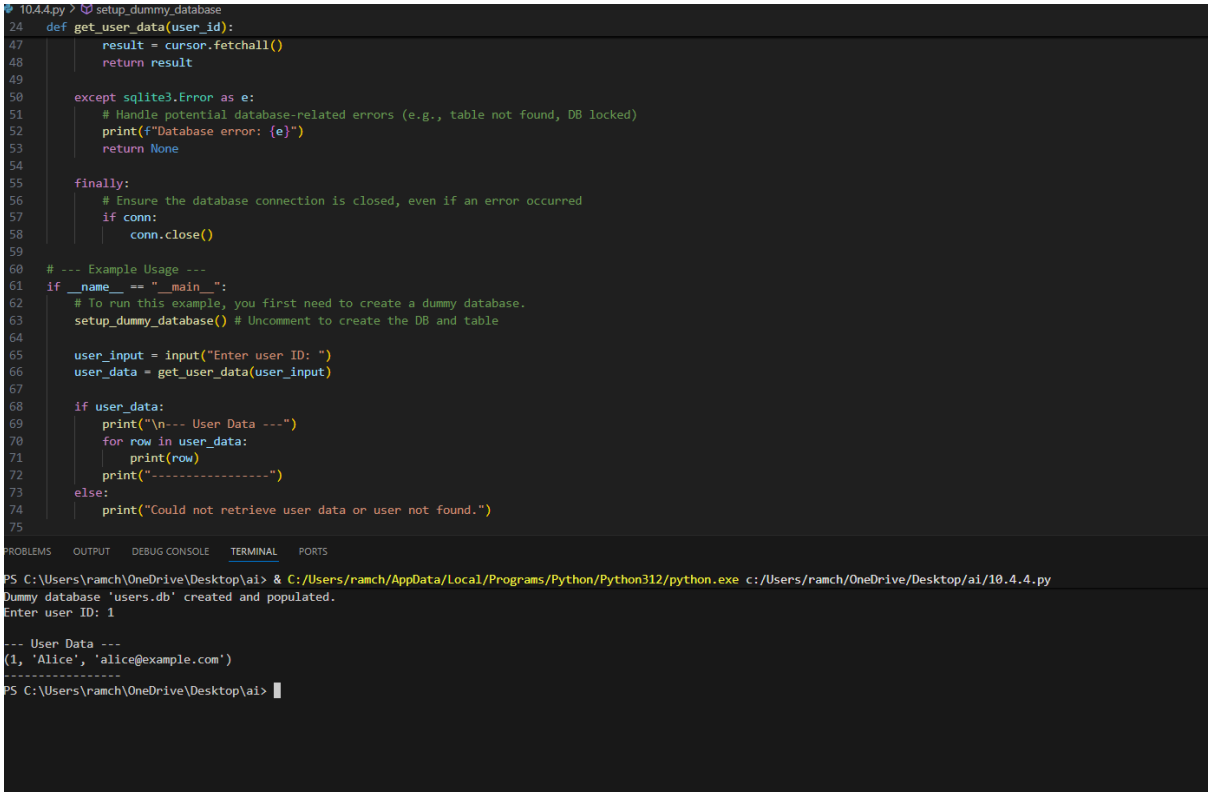
```
# buggy_code_task4.py
import sqlite3
def get_user_data(user_id):
conn = sqlite3.connect("users.db")
cursor = conn.cursor()
query = f"SELECT * FROM users WHERE id = {user_id};" #
Potential SQL injection risk
cursor.execute(query)
result = cursor.fetchall()
conn.close()
return result
user_input = input("Enter user ID: ")
print(get_user_data(user_input)
```

**PROMPT:**

Correct the code by applying proper indentations and identify all the errors and correct them give the corrected code.

**CODE & OUTPUT:**

```python
import sqlite3

def setup_dummy_database():
    """Creates and populates a dummy users.db for demonstration."""
    conn = sqlite3.connect("users.db")
    cursor = conn.cursor()
    # Drop table if it exists to start fresh
    cursor.execute("DROP TABLE IF EXISTS users")
    # Create table
    cursor.execute("""
        CREATE TABLE users (
            id INTEGER PRIMARY KEY,
            name TEXT NOT NULL,
            email TEXT NOT NULL
        );
    """)
    # Insert some sample data
    cursor.execute("INSERT INTO users (id, name, email) VALUES (?, ?, ?)", (1, 'Alice', 'alice@example.com'))
    cursor.execute("INSERT INTO users (id, name, email) VALUES (?, ?, ?)", (2, 'Bob', 'bob@example.com'))
    conn.commit()
    conn.close()
    print("Dummy database 'users.db' created and populated.")

def get_user_data(user_id):
    """
    Securely fetches user data from the database for a given user ID.

    Args:
        user_id: The ID of the user to retrieve.

    Returns:
        A list of tuples containing the user data, or None if an error occurs.
    """
    conn = None  # Initialize conn to None to handle connection errors
    try:
        # Connect to the database
        conn = sqlite3.connect("users.db")
        cursor = conn.cursor()

        # Use a parameterized query to prevent SQL injection
        # The '?' is a placeholder for the data.
        query = "SELECT * FROM users WHERE id = ?;"

        # Execute the query, passing the user_id as a tuple
        cursor.execute(query, (user_id,))

        result = cursor.fetchall()
        return result
```



```python
    def get_user_data(user_id):
            result = cursor.fetchall()
            return result

        except sqlite3.Error as e:
            # Handle potential database-related errors (e.g., table not found, DB locked)
            print(f"Database error: {e}")
            return None

        finally:
            # Ensure the database connection is closed, even if an error occurred
            if conn:
                conn.close()

    # --- Example Usage ---
    if __name__ == "__main__":
        # To run this example, you first need to create a dummy database.
        setup_dummy_database() # Uncomment to create the DB and table

        user_input = input("Enter user ID: ")
        user_data = get_user_data(user_input)

        if user_data:
            print("\n--- User Data ---")
            for row in user_data:
                print(row)
            print("-----------------")
        else:
            print("Could not retrieve user data or user not found.")
```

```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS

PS C:\Users\ramch\OneDrive\Desktop\ai> & C:/Users/ramch/AppData/Local/Programs/Python/Python312/python.exe c:/Users/ramch/OneDrive/Desktop/ai/10.4.4.py
Dummy database 'users.db' created and populated.
Enter user ID: 1

--- User Data ---
(1, 'Alice', 'alice@example.com')
-----------------
PS C:\Users\ramch\OneDrive\Desktop\ai>
```

**OBSERVATION:**

The code corrects the code by removing all the errors and applies the exception handling to the code to make it more efficient and accurate.

**TASK-05:**

Generate a review report for this messy code.

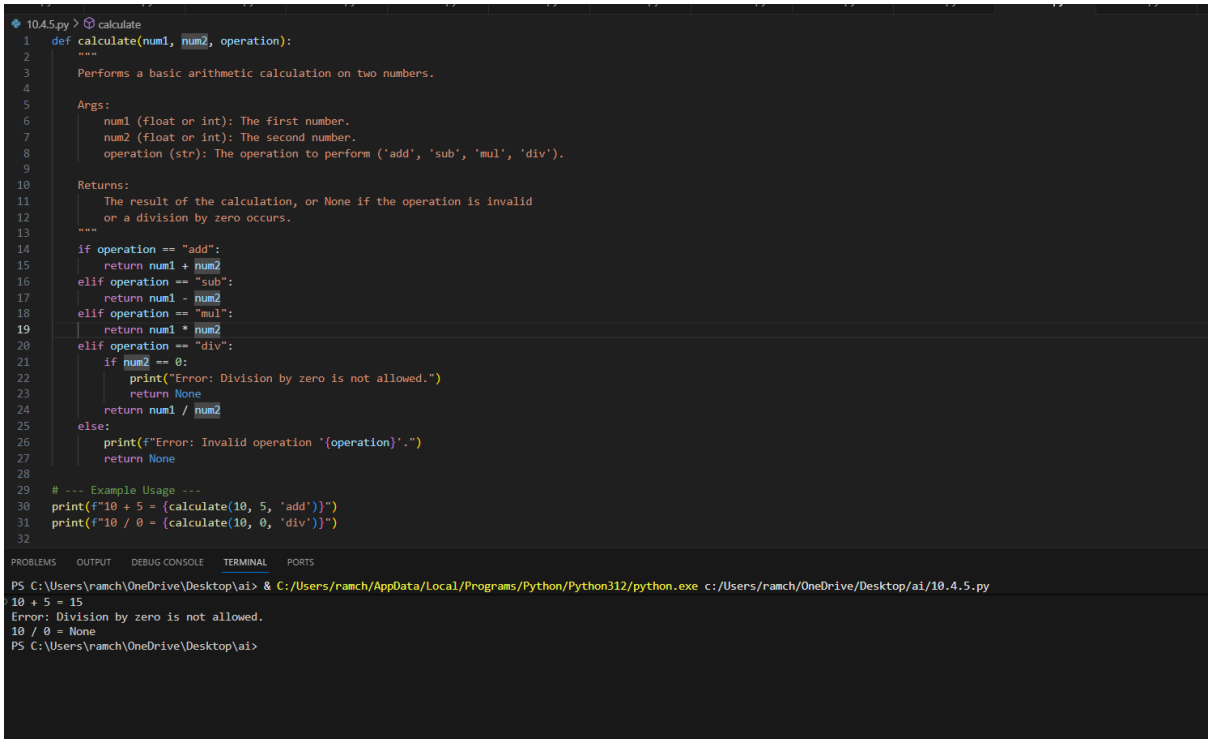
# buggy_code_task5.py

```
def calc(x,y,z):
if z=="add":
return x+y
elif z=="sub": return x-y
elif z=="mul":
return x*y
elif z=="div":
return x/y
else: print("wrong")
print(calc(10,5,"add"))
print(calc(10,0,"div"))
```

**PROMPT:**

Correct the code and give the report explaining the code.

**CODE & OUTPUT:**



```
10.4.5.py > calculate
def calculate(num1, num2, operation):
    """
    Performs a basic arithmetic calculation on two numbers.

    Args:
        num1 (float or int): The first number.
        num2 (float or int): The second number.
        operation (str): The operation to perform ('add', 'sub', 'mul', 'div').

    Returns:
        The result of the calculation, or None if the operation is invalid
        or a division by zero occurs.
    """
    if operation == "add":
        return num1 + num2
    elif operation == "sub":
        return num1 - num2
    elif operation == "mul":
        return num1 * num2
    elif operation == "div":
        if num2 == 0:
            print("Error: Division by zero is not allowed.")
            return None
        return num1 / num2
    else:
        print(f"Error: Invalid operation '{operation}'.")
        return None

# --- Example Usage ---
print(f"10 + 5 = {calculate(10, 5, 'add')}")
print(f"10 / 0 = {calculate(10, 0, 'div')}")

PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS

PS C:\Users\ramch\OneDrive\Desktop\ai> & C:/Users/ramch/AppData/Local/Programs/Python/Python312/python.exe c:/Users/ramch/OneDrive/Desktop/ai/10.4.5.py
10 + 5 = 15
Error: Division by zero is not allowed.
10 / 0 = None
PS C:\Users\ramch\OneDrive\Desktop\ai>
```

**EXPLANATION:**

AI-Generated Code Review Report

The provided Python code snippet for a simple calculator has several areas that can be improved to meet standard coding practices. Below is a detailed analysis based on your criteria.

1. Missing Docstrings

The function calc lacks a docstring. Docstrings are crucial for explaining what a function does, its parameters, and what it returns. This makes the code easier for others (and your future self) to understand and use.

2. Inconsistent Formatting and PEP 8 Compliance

The code does not follow standard Python formatting guidelines (PEP 8), which harms readability.

Indentation: The bodies of the if, elif, and else statements are not correctly indented. Python relies on indentation to define code blocks.

Inline return: The line elif z=="sub": return x-y has the return statement on the same line as the condition. While syntactically allowed, it's inconsistent with the other branches and generally discouraged for readability.

3. Missing Error Handling

A critical bug exists in the code. The test case print(calc(10, 0, "div")) will cause the program to crash with a ZeroDivisionError because it attempts to divide by zero. The function should handle this case gracefully.

4. Non-Descriptive Function and Variable Names

The names used (calc, x, y, z) are very generic. Using more descriptive names like calculate, num1, num2, and operation would make the function's purpose immediately clear without needing to read the implementation

Summary of Improvements:

Clarity: Function and variable names are now descriptive.

Documentation: A comprehensive docstring has been added.

Robustness: It now includes a check to prevent ZeroDivisionError and handles invalid operations gracefully.

Readability: The code is formatted consistently according to PEP 8 guidelines.

**OBSERVATION:**

AI generated the accurate report of the code and it also corrected the code according to the prompt in an efficient way.