AI ASSISTED CODING

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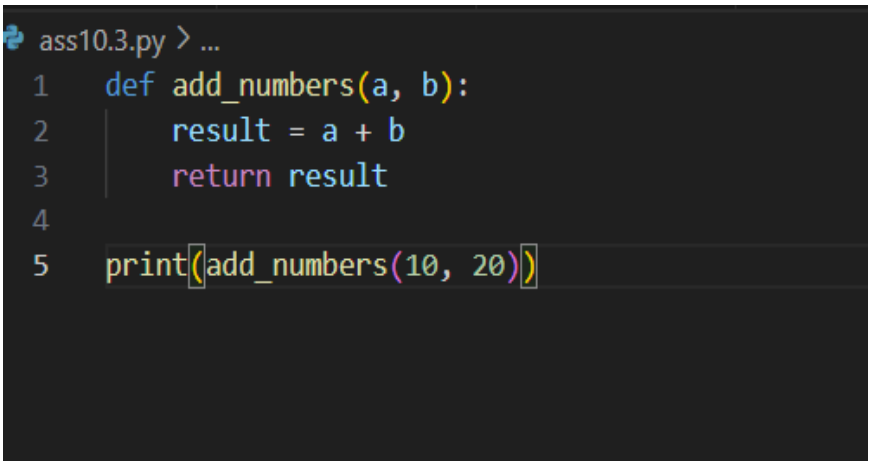
BATCH:05

1

TASK1#
PROMPT:
I have a Python script with syntax, indentation, and variable errors. Please identify and fix them

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

CODE:



OUTPUT:

OBSERVATION:

- Missing Colon in Function Definition:
  - Original: def add_numbers(a, b)
  - Issue: Python function definitions require a colon (:) at the end of the def line to indicate the start of the function's code block.
  - Fix: def add_numbers(a, b):
- Incorrect Indentation:
  - Original: The lines result = a + b and return reslt were not

properly indented under the function definition.

- Issue: Python uses indentation to define code blocks. All statements within a function must be indented consistently.
- Fix: The lines result = a + b and return result have been indented to align correctly with the function definition.

Task 2

PROMPT:

I have a Python script that finds duplicate numbers in a list, but the logic is inefficient because it uses nested loops. Please optimize the code so that it still produces the correct result but runs more efficiently.

CODE:

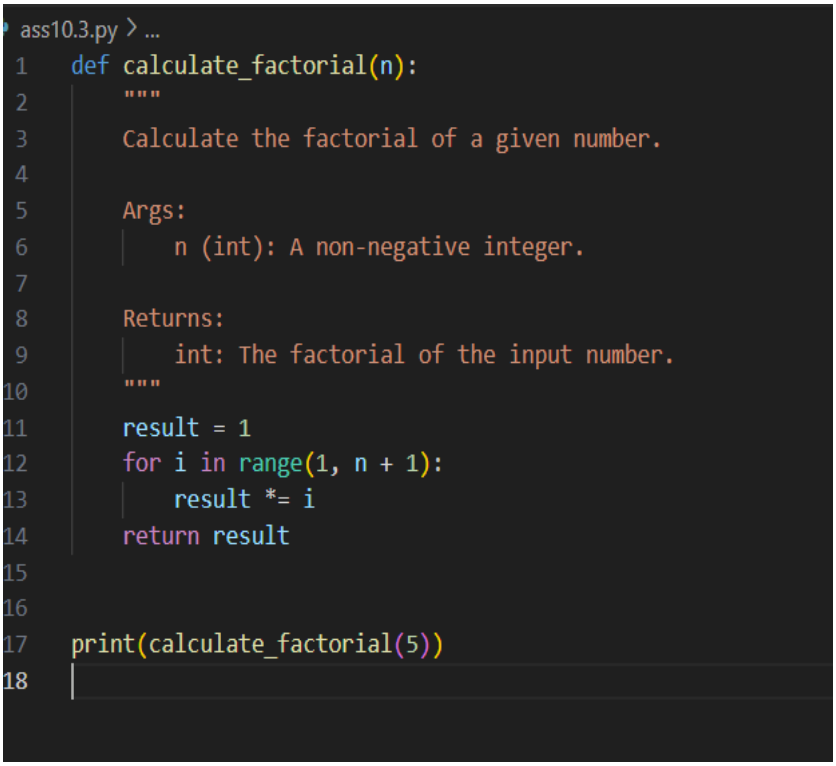
```
ass10.3.py > ...
1   def find_duplicates(nums):
2       seen = set()
3       duplicates = set()
4       for num in nums:
5           if num in seen:
6               duplicates.add(num)
7           else:
8               seen.add(num)
9       return list(duplicates)
10
11  numbers = [1, 2, 3, 2, 4, 5, 1, 6, 1, 2]
12  print(find_duplicates(numbers))
13
```

OUTPUT:

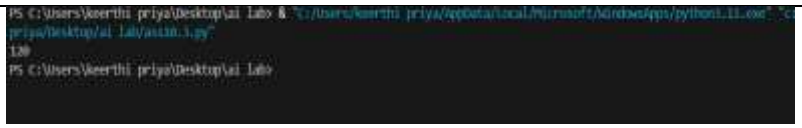
```
priya/Desktop/ai lab/ass10.3.py"
[1, 2]
PS C:\Users\keerthi priya\Desktop\ai lab>
```

OBSERVATION:

 The original code used two nested loops ($O(n^2)$ time complexity) to compare every element with every other element.

	□ In the optimized code, we use two sets (seen and duplicates) to track numbers efficiently. • seen keeps track of elements we've already encountered. • If a number is already in seen, it gets added to duplicates. □ This reduces the time complexity to O(n) and makes the solution much faster for large input lists. □ The output remains the same:	
	Task 3 PROMPT: I have a Python script that calculates the factorial of a number, but the code is messy and not PEP 8–compliant. Please refactor it into a clean, well-structured version with: • Proper indentation and formatting. • A meaningful function name (calculate_factorial). • Clear variable naming. • A docstring explaining the function. CODE:  OUTPUT:	

```
ass10.3.py > ...
1   def calculate_factorial(n):
2       """
3       Calculate the factorial of a given number.
4
5       Args:
6           n (int): A non-negative integer.
7
8       Returns:
9           int: The factorial of the input number.
10      """
11      result = 1
12      for i in range(1, n + 1):
13          result *= i
14      return result
15
16
17  print(calculate_factorial(5))
18
```

	 OBSERVATION: □ Function name changed from c → calculate_factorial for clarity. □ Variable x renamed to result, making the purpose more descriptive. □ PEP 8 formatting applied: proper indentation, spaces around operators, blank lines for readability. □ Docstring added to explain parameters, return type, and purpose. □ Loop logic preserved but made more readable with result *= i.	
	Task 4: PROMPT: I have a Python script that fetches user data from a SQLite database. The current code is unsafe because it uses string formatting in SQL queries, which makes it vulnerable to SQL injection. Please: • Use parameterized queries (? placeholders) instead of string concatenation. • Add try–except blocks to handle database errors gracefully. • Include input validation before executing the query. • Refactor the code to follow clean practices. CODE:	

```python
import sqlite3


def get_user_data(user_id):
    """
    Fetch user data from the database by user_id.

    Args:
        user_id (int): ID of the user to look up.

    Returns:
        list: A list of rows matching the user_id, or an empty list if none found.
    """
    try:
        conn = sqlite3.connect("users.db")
        cursor = conn.cursor()
        query = "SELECT * FROM users WHERE id = ?;"
        cursor.execute(query, (user_id,))
        result = cursor.fetchall()
    except sqlite3.Error as e:
        print(f"Database error: {e}")
        result = []
    finally:
        if conn:
            conn.close()
    return result


def main():
    user_input = input("Enter user ID: ").strip()

    if not user_input.isdigit():
        print("Invalid input. Please enter a numeric user ID.")
        return

    user_id = int(user_input)
    data = get_user_data(user_id)
```


```python
def main():
    user_id = int(user_input)
    data = get_user_data(user_id)

    if data:
        print("User Data:", data)
    else:
        print("No user found with that ID.")


if __name__ == "__main__":
    main()
```


OUTPUT:

OBSERVATION:

- Exception Handling:
  - Added try–except to catch sqlite3.Error.
  - Ensures the program doesn't crash on DB errors.
- Input Validation:
  - Checked user_input.isdigit() before converting to integer.
  - Prevents invalid input like "abc" from reaching the query.
- Resource Management:
  - Used finally to close the DB connection safely.

Task 5: Automated Code Review Report Generation
Task: 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"))
```

Expected Output:

AI-generated review report should mention:

- Missing docstrings
- Inconsistent formatting (indentation, inline return)
- Missing error handling for division by zero
- Non-descriptive function/variable names
- Suggestions for readability and PEP 8 compliance

PROMPT:

I have a Python script that performs basic arithmetic operations, but it is messy and not PEP 8–compliant. Please generate a review report identifying issues such as:

- Missing docstrings.
- Inconsistent formatting and indentation.
- Inline return statements without readability.
- Missing error handling (division by zero).
- Non-descriptive function and variable names.
- Suggestions for improving readability and PEP 8 compliance.

After that, provide a refactored version of the code.

CODE:

```
ass10.3.5.py > ...
def calculate(x, y, operation):
    """
    Perform basic arithmetic operations.

    Args:
        x (float): First operand.
        y (float): Second operand.
        operation (str): The operation to perform: 'add', 'sub', 'mul', or 'div'.

    Returns:
        float | None: Result of the operation, or None if invalid operation or error.
    """
    if operation == "add":
        return x + y
    elif operation == "sub":
        return x - y
    elif operation == "mul":
        return x * y
    elif operation == "div":
        if y == 0:
            print("Error: Division by zero is not allowed.")
            return None
        return x / y
    else:
        print("Error: Invalid operation.")
        return None


print(calculate(10, 5, "add"))
print(calculate(10, 0, "div"))
```

OUTPUT:

OBSERVATION:

Issues in Original Code:

1. **Missing docstrings** – The function has no explanation of purpose, arguments, or return values.
2. **Inconsistent formatting** – Mixed inline and block returns (elif z=="sub": return x-y).
3. **Division by zero** – No error handling, which can cause runtime exceptions.
4. **Non-descriptive names** – Function calc and parameter z are not descriptive; replaced with calculate and operation.
5. **PEP 8 Violations** – Missing spaces after commas, no blank lines between function and calls, inconsistent indentation.