Name : **B.srishanth** Roll no : 2403A510G3

ASSIGNMENT : 10.3 SUBJECT : AI ASSISTED CODING

Task 1: Syntax and Error Detection

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

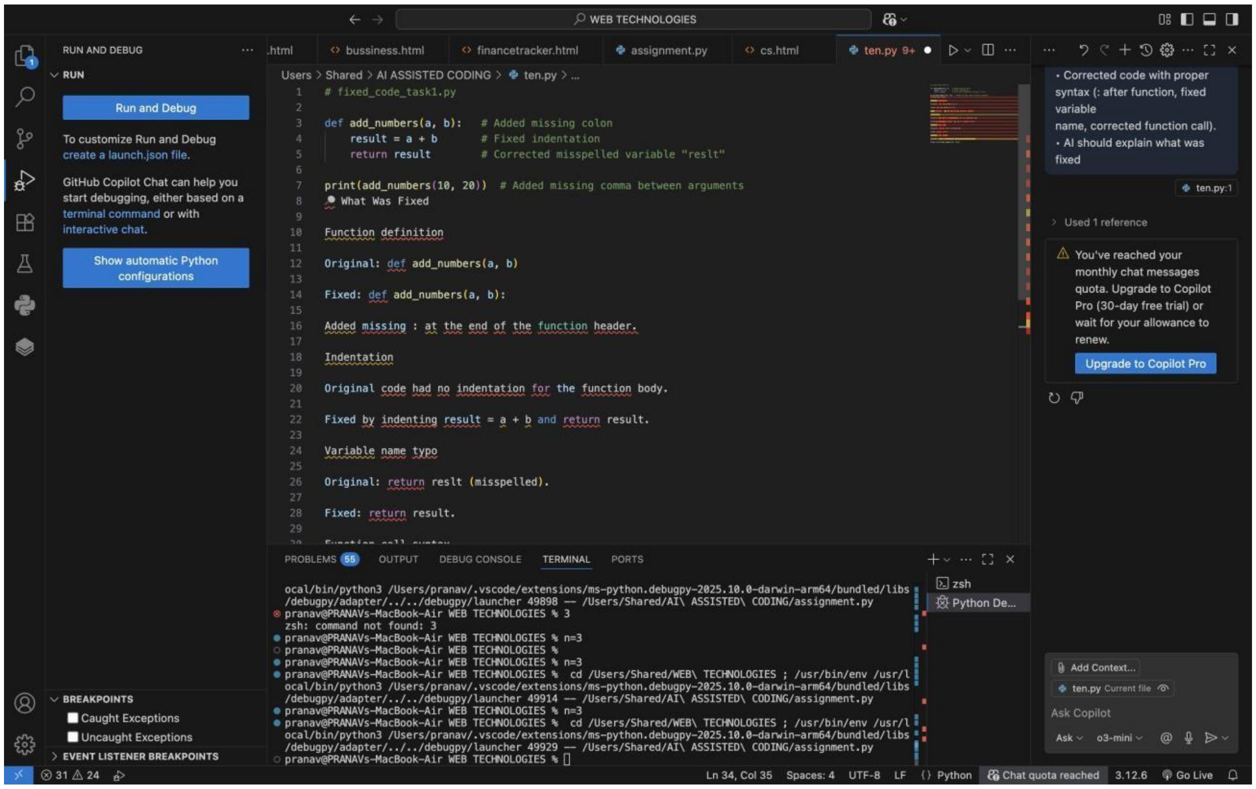
```
# buggy_code_task1.py
def add_numbers(a, b)
result = a + b
return reslt
print(add_numbers(10 20))
```

Expected Output:

- Corrected code with proper syntax (: after function, fixed variable name, corrected function call).
- AI should explain what was fixed

PROMPT :

FIND THE ERROR IN THE GIVEN CODE AND REWRITE THE CORRECT CODE AND STATE THE DIFFERENCE



```python
# fixed_code_task1.py

def add_numbers(a, b):   # Added missing colon
    result = a + b       # Fixed indentation
    return result        # Corrected misspelled variable "reslt"

print(add_numbers(10, 20))  # Added missing comma between arguments
🔎 What Was Fixed

Function definition

Original: def add_numbers(a, b)

Fixed: def add_numbers(a, b):

Added missing : at the end of the function header.

Indentation

Original code had no indentation for the function body.

Fixed by indenting result = a + b and return result.

Variable name typo

Original: return reslt (misspelled).

Fixed: return result.
```

```
ocal/bin/python3 /Users/pranav/.vscode/extensions/ms-python.debugpy-2025.10.0-darwin-arm64/bundled/libs
/debugpy/adapter/../../debugpy/launcher 49898 -- /Users/Shared/AI\ ASSISTED\ CODING/assignment.py
pranav@PRANAVs-MacBook-Air WEB TECHNOLOGIES % 3
zsh: command not found: 3
pranav@PRANAVs-MacBook-Air WEB TECHNOLOGIES % n=3
pranav@PRANAVs-MacBook-Air WEB TECHNOLOGIES %
pranav@PRANAVs-MacBook-Air WEB TECHNOLOGIES % n=3
pranav@PRANAVs-MacBook-Air WEB TECHNOLOGIES %  cd /Users/Shared/WEB\ TECHNOLOGIES ; /usr/bin/env /usr/l
ocal/bin/python3 /Users/pranav/.vscode/extensions/ms-python.debugpy-2025.10.0-darwin-arm64/bundled/libs
/debugpy/adapter/../../debugpy/launcher 49914 -- /Users/Shared/AI\ ASSISTED\ CODING/assignment.py
pranav@PRANAVs-MacBook-Air WEB TECHNOLOGIES % n=3
pranav@PRANAVs-MacBook-Air WEB TECHNOLOGIES %  cd /Users/Shared/WEB\ TECHNOLOGIES ; /usr/bin/env /usr/l
ocal/bin/python3 /Users/pranav/.vscode/extensions/ms-python.debugpy-2025.10.0-darwin-arm64/bundled/libs
/debugpy/adapter/../../debugpy/launcher 49929 -- /Users/Shared/AI\ ASSISTED\ CODING/assignment.py
pranav@PRANAVs-MacBook-Air WEB TECHNOLOGIES % 
```

- Corrected code with proper syntax (: after function, fixed variable name, corrected function call).
- AI should explain what was fixed

Used 1 reference

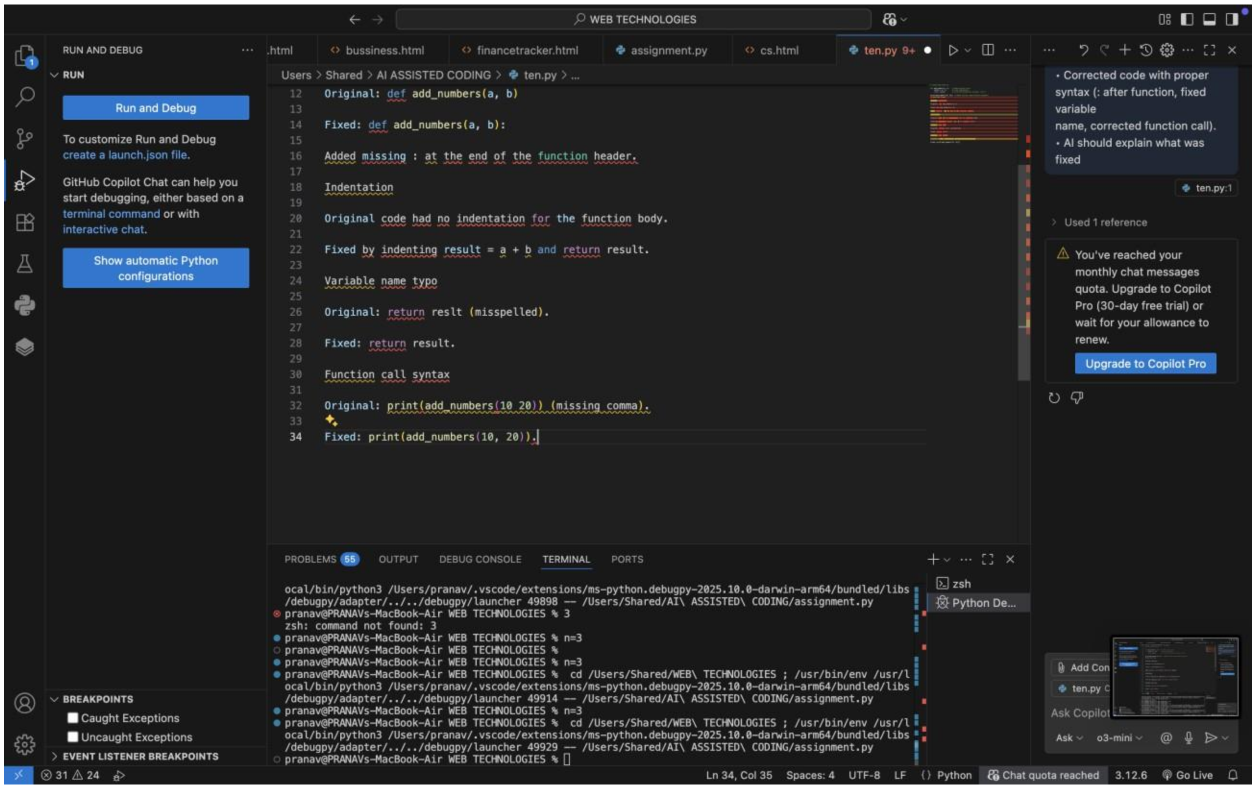
⚠ You've reached your monthly chat messages quota. Upgrade to Copilot Pro (30-day free trial) or wait for your allowance to renew.

Upgrade to Copilot Pro

To customize Run and Debug create a launch.json file.

GitHub Copilot Chat can help you start debugging, either based on a terminal command or with interactive chat.

Ln 34, Col 35   Spaces: 4   UTF-8   LF   {} Python   Chat quota reached   3.12.6   Go Live



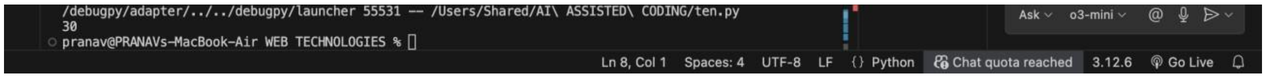
```python
Original: def add_numbers(a, b)

Fixed: def add_numbers(a, b):

Added missing : at the end of the function header.

Indentation

Original code had no indentation for the function body.

Fixed by indenting result = a + b and return result.

Variable name typo

Original: return reslt (misspelled).

Fixed: return result.

Function call syntax

Original: print(add_numbers(10 20)) (missing comma).

Fixed: print(add_numbers(10, 20)).
```

```
ocal/bin/python3 /Users/pranav/.vscode/extensions/ms-python.debugpy-2025.10.0-darwin-arm64/bundled/libs
/debugpy/adapter/../../debugpy/launcher 49898 -- /Users/Shared/AI\ ASSISTED\ CODING/assignment.py
pranav@PRANAVs-MacBook-Air WEB TECHNOLOGIES % 3
zsh: command not found: 3
pranav@PRANAVs-MacBook-Air WEB TECHNOLOGIES % n=3
pranav@PRANAVs-MacBook-Air WEB TECHNOLOGIES %
pranav@PRANAVs-MacBook-Air WEB TECHNOLOGIES % n=3
pranav@PRANAVs-MacBook-Air WEB TECHNOLOGIES %  cd /Users/Shared/WEB\ TECHNOLOGIES ; /usr/bin/env /usr/l
ocal/bin/python3 /Users/pranav/.vscode/extensions/ms-python.debugpy-2025.10.0-darwin-arm64/bundled/libs
/debugpy/adapter/../../debugpy/launcher 49914 -- /Users/Shared/AI\ ASSISTED\ CODING/assignment.py
pranav@PRANAVs-MacBook-Air WEB TECHNOLOGIES % n=3
pranav@PRANAVs-MacBook-Air WEB TECHNOLOGIES %  cd /Users/Shared/WEB\ TECHNOLOGIES ; /usr/bin/env /usr/l
ocal/bin/python3 /Users/pranav/.vscode/extensions/ms-python.debugpy-2025.10.0-darwin-arm64/bundled/libs
/debugpy/adapter/../../debugpy/launcher 49929 -- /Users/Shared/AI\ ASSISTED\ CODING/assignment.py
pranav@PRANAVs-MacBook-Air WEB TECHNOLOGIES % 
```

- Corrected code with proper syntax (: after function, fixed variable name, corrected function call).
- AI should explain what was fixed

⚠ You've reached your monthly chat messages quota. Upgrade to Copilot Pro (30-day free trial) or wait for your allowance to renew.

OUTPUT :



```
/debugpy/adapter/../../debugpy/launcher 55531 -- /Users/Shared/AI\ ASSISTED\ CODING/ten.py
30
pranav@PRANAVs-MacBook-Air WEB TECHNOLOGIES % 
```

CHANGES :

1. **Function definition**
   a. Original: def add_numbers(a, b)
   b. Fixed: def add_numbers(a, b):
   c. Added missing : at the end of the function header.
2. **Indentation**
   a. Original code had no indentation for the function body.
   b. Fixed by indenting result = a + b and return result.
3. **Variable name typo**
   a. Original: return reslt (misspelled).
   b. Fixed: return result.
4. **Function call syntax**
   a. Original: print(add_numbers(10 20)) (missing comma).
   b. Fixed: print(add_numbers(10, 20)).

Task 2: Logical and Performance Issue Review
Task: Optimize inefficient logic while keeping the result correct.

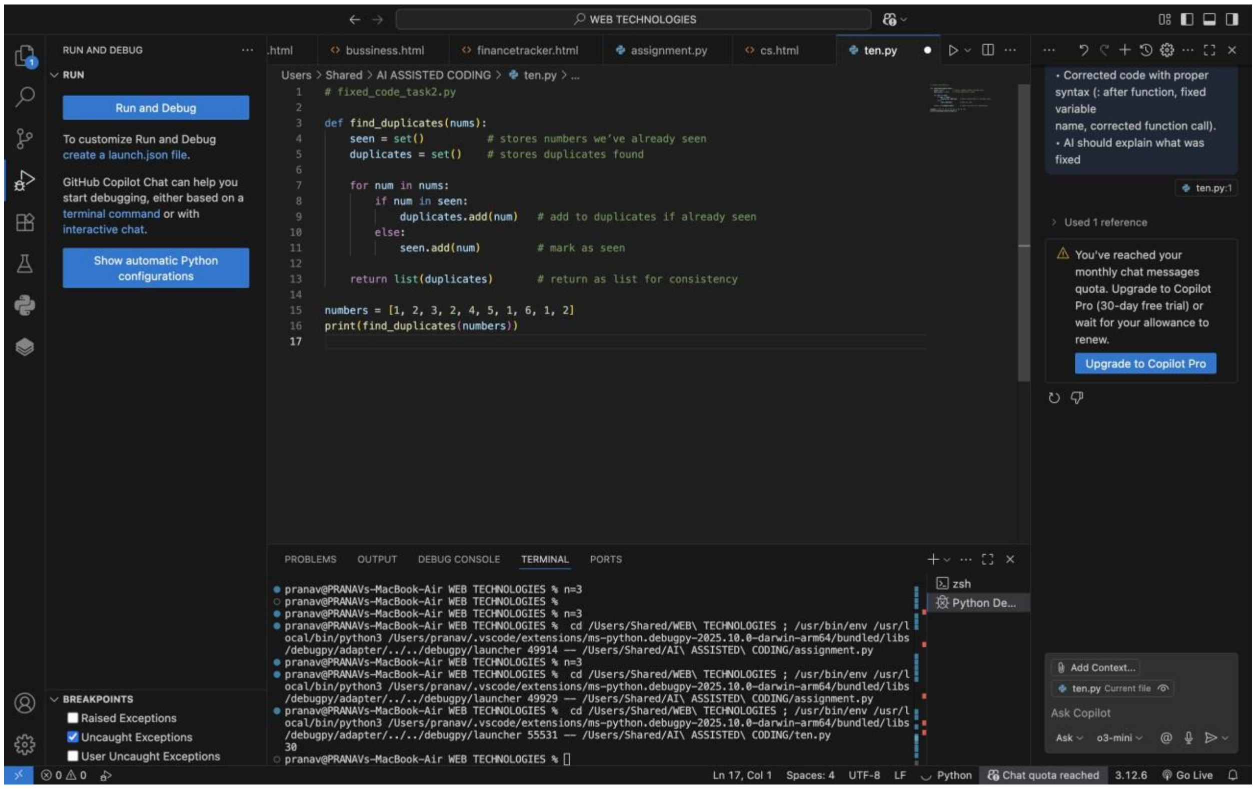
```
# buggy_code_task2.py
def find_duplicates(nums):
duplicates = []
for i in range(len(nums)):
for j in range(len(nums)):
if i != j and nums[i] == nums[j] and nums[i] not in duplicates:
duplicates.append(nums[i])
return duplicates
numbers = [1,2,3,2,4,5,1,6,1,2]
print(find_duplicates(numbers))
```

Expected Output:
• More efficient duplicate detection (e.g., using sets).
• AI should explain the optimization.

PROMPT USED :

CORRECT THE LOGIC GIVEN FOR THE CODE AND RUN THE CODE FOR OUTPUT

CODE GENERATED :



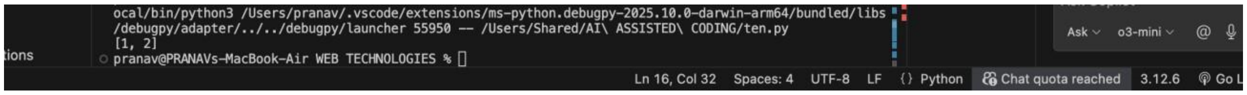
```python
# fixed_code_task2.py

def find_duplicates(nums):
    seen = set()          # stores numbers we've already seen
    duplicates = set()    # stores duplicates found

    for num in nums:
        if num in seen:
            duplicates.add(num)   # add to duplicates if already seen
        else:
            seen.add(num)         # mark as seen

    return list(duplicates)       # return as list for consistency

numbers = [1, 2, 3, 2, 4, 5, 1, 6, 1, 2]
print(find_duplicates(numbers))
```

• Corrected code with proper syntax (: after function, fixed variable
name, corrected function call).
• AI should explain what was fixed

You've reached your monthly chat messages quota. Upgrade to Copilot Pro (30-day free trial) or wait for your allowance to renew.

```
pranav@PRANAVs-MacBook-Air WEB TECHNOLOGIES % n=3
pranav@PRANAVs-MacBook-Air WEB TECHNOLOGIES %
pranav@PRANAVs-MacBook-Air WEB TECHNOLOGIES % n=3
pranav@PRANAVs-MacBook-Air WEB TECHNOLOGIES %  cd /Users/Shared/WEB\ TECHNOLOGIES ; /usr/bin/env /usr/l
ocal/bin/python3 /Users/pranav/.vscode/extensions/ms-python.debugpy-2025.10.0-darwin-arm64/bundled/libs
/debugpy/adapter/../../debugpy/launcher 49914 -- /Users/Shared/AI\ ASSISTED\ CODING/assignment.py
pranav@PRANAVs-MacBook-Air WEB TECHNOLOGIES % n=3
pranav@PRANAVs-MacBook-Air WEB TECHNOLOGIES %  cd /Users/Shared/WEB\ TECHNOLOGIES ; /usr/bin/env /usr/l
ocal/bin/python3 /Users/pranav/.vscode/extensions/ms-python.debugpy-2025.10.0-darwin-arm64/bundled/libs
/debugpy/adapter/../../debugpy/launcher 49929 -- /Users/Shared/AI\ ASSISTED\ CODING/assignment.py
pranav@PRANAVs-MacBook-Air WEB TECHNOLOGIES %  cd /Users/Shared/WEB\ TECHNOLOGIES ; /usr/bin/env /usr/l
ocal/bin/python3 /Users/pranav/.vscode/extensions/ms-python.debugpy-2025.10.0-darwin-arm64/bundled/libs
/debugpy/adapter/../../debugpy/launcher 55531 -- /Users/Shared/AI\ ASSISTED\ CODING/ten.py
30
pranav@PRANAVs-MacBook-Air WEB TECHNOLOGIES % 
```

OUTPUT:



```
ocal/bin/python3 /Users/pranav/.vscode/extensions/ms-python.debugpy-2025.10.0-darwin-arm64/bundled/libs
/debugpy/adapter/../../debugpy/launcher 55950 -- /Users/Shared/AI\ ASSISTED\ CODING/ten.py
[1, 2]
pranav@PRANAVs-MacBook-Air WEB TECHNOLOGIES % 
```

CHANGES MADE :

1. **Original Logic**
   a. Used **two nested loops** → O(n^2) time complexity.
   b. Checked each element against all others.
2. **New Logic**
   a. Uses **two sets (seen, duplicates)** → only **one loop** → O(n) time complexity.
   b. No repeated scanning of the list.

3. **Correctness**
    a. Still returns only unique duplicates (e.g., if 1 appears many times, it only shows once).

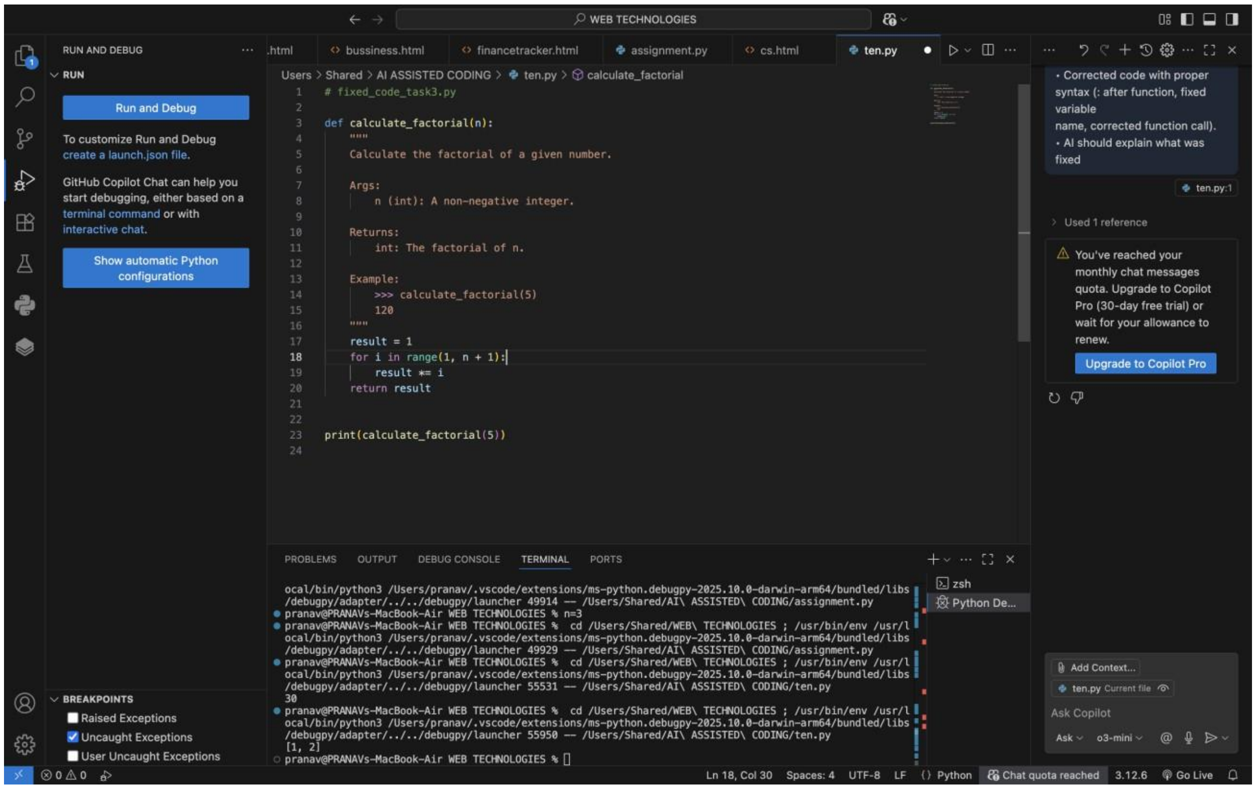
Task 3: Code Refactoring for Readability
Task: Refactor messy code into clean, PEP 8–compliant, well-structured code.
# buggy_code_task3.py

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

Expected Output:
Function renamed to calculate_factorial.
Proper indentation, variable naming, docstrings, and formatting.
AI should provide a more readable version.

PROMPT USED : REWRITE THE GIVEN CODE IN A CLEAN FORMAT

CODE GENERATED :



```python
# fixed_code_task3.py

def calculate_factorial(n):
    """
    Calculate the factorial of a given number.

    Args:
        n (int): A non-negative integer.

    Returns:
        int: The factorial of n.

    Example:
        >>> calculate_factorial(5)
        120
    """
    result = 1
    for i in range(1, n + 1):
        result *= i
    return result


print(calculate_factorial(5))
```

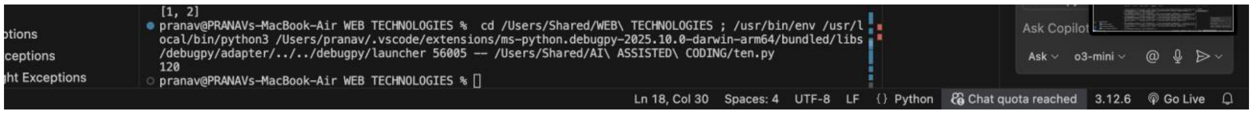
```
ocal/bin/python3 /Users/pranav/.vscode/extensions/ms-python.debugpy-2025.10.0-darwin-arm64/bundled/libs
/debugpy/adapter/../../debugpy/launcher 49914 -- /Users/Shared/AI\ ASSISTED\ CODING/assignment.py
pranav@PRANAVs-MacBook-Air WEB TECHNOLOGIES % n=3
pranav@PRANAVs-MacBook-Air WEB TECHNOLOGIES %  cd /Users/Shared/WEB\ TECHNOLOGIES ; /usr/bin/env /usr/l
ocal/bin/python3 /Users/pranav/.vscode/extensions/ms-python.debugpy-2025.10.0-darwin-arm64/bundled/libs
/debugpy/adapter/../../debugpy/launcher 49929 -- /Users/Shared/AI\ ASSISTED\ CODING/assignment.py
pranav@PRANAVs-MacBook-Air WEB TECHNOLOGIES %  cd /Users/Shared/WEB\ TECHNOLOGIES ; /usr/bin/env /usr/l
ocal/bin/python3 /Users/pranav/.vscode/extensions/ms-python.debugpy-2025.10.0-darwin-arm64/bundled/libs
/debugpy/adapter/../../debugpy/launcher 55531 -- /Users/Shared/AI\ ASSISTED\ CODING/ten.py
30
pranav@PRANAVs-MacBook-Air WEB TECHNOLOGIES %  cd /Users/Shared/WEB\ TECHNOLOGIES ; /usr/bin/env /usr/l
ocal/bin/python3 /Users/pranav/.vscode/extensions/ms-python.debugpy-2025.10.0-darwin-arm64/bundled/libs
/debugpy/adapter/../../debugpy/launcher 55950 -- /Users/Shared/AI\ ASSISTED\ CODING/ten.py
[1, 2]
pranav@PRANAVs-MacBook-Air WEB TECHNOLOGIES % 
```

- Corrected code with proper syntax (: after function, fixed variable name, corrected function call).
- AI should explain what was fixed

Used 1 reference

You've reached your monthly chat messages quota. Upgrade to Copilot Pro (30-day free trial) or wait for your allowance to renew.

OUTPUT GENERATED :



```
[1, 2]
pranav@PRANAVs-MacBook-Air WEB TECHNOLOGIES %  cd /Users/Shared/WEB\ TECHNOLOGIES ; /usr/bin/env /usr/l
ocal/bin/python3 /Users/pranav/.vscode/extensions/ms-python.debugpy-2025.10.0-darwin-arm64/bundled/libs
/debugpy/adapter/../../debugpy/launcher 56005 -- /Users/Shared/AI\ ASSISTED\ CODING/ten.py
120
pranav@PRANAVs-MacBook-Air WEB TECHNOLOGIES % 
```

Improvements Made

1. **Function name**
   a. Original: c → unclear.
   b. Fixed: calculate_factorial → descriptive and meaningful.
2. **Variable naming**
   a. Original: x → vague.
   b. Fixed: result → shows purpose.
3. **Formatting s PEP 8 compliance**

   a. Added proper indentation, spacing, and blank lines.

4. **Docstring**
   a. Added **Google-style docstring** explaining parameters, return type, and example usage.

Task 4: Security and Error Handling Enhancement

Task: 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))
```

Expected Output:

Safe query using parameterized SQL (? placeholders).

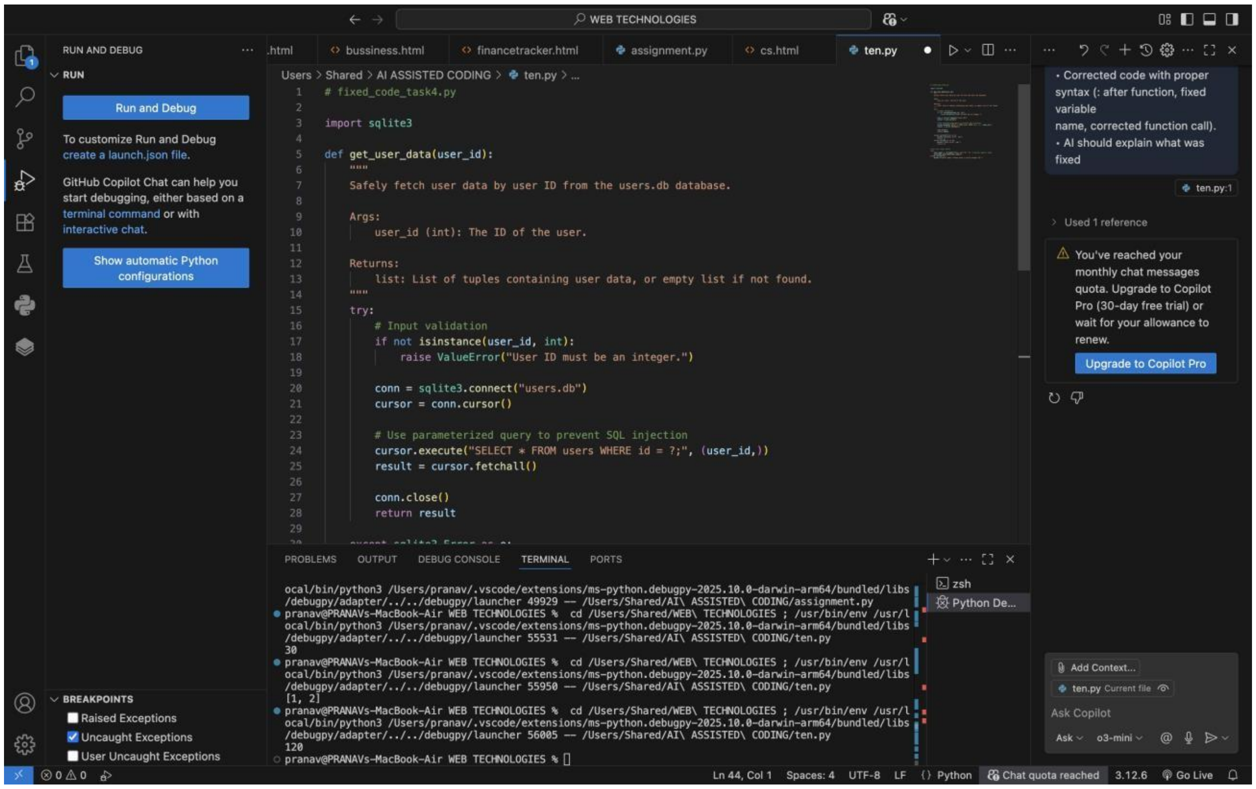
Try-except block for database errors.

Input validation before query execution

PROMPT USED :

TO ADD SECURITY AND ERROR HANDLING TO ENHANCE THE GIVEN CODE AND TRY EXCEPT BLOCK FOR DATABASE ERRORS

CODE GENERATED :



```python
# fixed_code_task4.py

import sqlite3

def get_user_data(user_id):
    """
    Safely fetch user data by user ID from the users.db database.

    Args:
        user_id (int): The ID of the user.

    Returns:
        list: List of tuples containing user data, or empty list if not found.
    """
    try:
        # Input validation
        if not isinstance(user_id, int):
            raise ValueError("User ID must be an integer.")

        conn = sqlite3.connect("users.db")
        cursor = conn.cursor()

        # Use parameterized query to prevent SQL injection
        cursor.execute("SELECT * FROM users WHERE id = ?;", (user_id,))
        result = cursor.fetchall()

        conn.close()
        return result

```

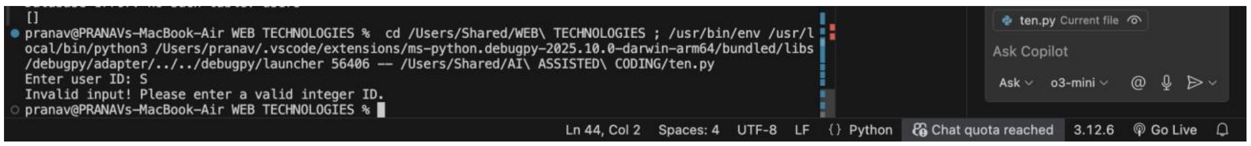
```
ocal/bin/python3 /Users/pranav/.vscode/extensions/ms-python.debugpy-2025.10.0-darwin-arm64/bundled/libs
/debugpy/adapter/../../debugpy/launcher 49929 -- /Users/Shared/AI\ ASSISTED\ CODING/assignment.py
pranav@PRANAVs-MacBook-Air WEB TECHNOLOGIES %  cd /Users/Shared/WEB\ TECHNOLOGIES ; /usr/bin/env /usr/l
ocal/bin/python3 /Users/pranav/.vscode/extensions/ms-python.debugpy-2025.10.0-darwin-arm64/bundled/libs
/debugpy/adapter/../../debugpy/launcher 55531 -- /Users/Shared/AI\ ASSISTED\ CODING/ten.py
30
pranav@PRANAVs-MacBook-Air WEB TECHNOLOGIES %  cd /Users/Shared/WEB\ TECHNOLOGIES ; /usr/bin/env /usr/l
ocal/bin/python3 /Users/pranav/.vscode/extensions/ms-python.debugpy-2025.10.0-darwin-arm64/bundled/libs
/debugpy/adapter/../../debugpy/launcher 55950 -- /Users/Shared/AI\ ASSISTED\ CODING/ten.py
[1, 2]
pranav@PRANAVs-MacBook-Air WEB TECHNOLOGIES %  cd /Users/Shared/WEB\ TECHNOLOGIES ; /usr/bin/env /usr/l
ocal/bin/python3 /Users/pranav/.vscode/extensions/ms-python.debugpy-2025.10.0-darwin-arm64/bundled/libs
/debugpy/adapter/../../debugpy/launcher 56005 -- /Users/Shared/AI\ ASSISTED\ CODING/ten.py
120
pranav@PRANAVs-MacBook-Air WEB TECHNOLOGIES % 
```

• Corrected code with proper syntax (: after function, fixed variable name, corrected function call).
• AI should explain what was fixed

You've reached your monthly chat messages quota. Upgrade to Copilot Pro (30-day free trial) or wait for your allowance to renew.

WEB TECHNOLOGIES
RUN AND DEBUG
RUN
Run and Debug
To customize Run and Debug create a launch.json file.
GitHub Copilot Chat can help you start debugging, either based on a terminal command or with interactive chat.
Show automatic Python configurations
BREAKPOINTS
Raised Exceptions
Uncaught Exceptions
User Uncaught Exceptions
Users > Shared > AI ASSISTED CODING > ten.py > ...
Used 1 reference
Upgrade to Copilot Pro
Add Context...
Ask Copilot
Ln 44, Col 1 Spaces: 4 UTF-8 LF {} Python Chat quota reached 3.12.6 Go Live

OUTPUT GENERATED :



```
[]
pranav@PRANAVs-MacBook-Air WEB TECHNOLOGIES %  cd /Users/Shared/WEB\ TECHNOLOGIES ; /usr/bin/env /usr/l
ocal/bin/python3 /Users/pranav/.vscode/extensions/ms-python.debugpy-2025.10.0-darwin-arm64/bundled/libs
/debugpy/adapter/../../debugpy/launcher 56406 -- /Users/Shared/AI\ ASSISTED\ CODING/ten.py
Enter user ID: S
Invalid input! Please enter a valid integer ID.
pranav@PRANAVs-MacBook-Air WEB TECHNOLOGIES % 
```

ten.py Current file
Ask Copilot
Ask o3-mini
Ln 44, Col 2 Spaces: 4 UTF-8 LF {} Python Chat quota reached 3.12.6 Go Live

CHANGES MADE :

1. **SQL Injection Protection**
    a. Replaced string interpolation (f"SELECT ... {user_id}") with **parameterized queries** (? placeholders).
2. **Input Validation**
    a. Ensures user_id is an integer before running the query.
3. **Error Handling**
    a. Added try-except for sqlite3.Error (database issues).
    b. Added ValueError handling for invalid input.

4. **Safe User Input**
    a. Wrapped input() in int() conversion and exception handling.

🟩 If users.db contains id=1, entering 1 will safely return that record.

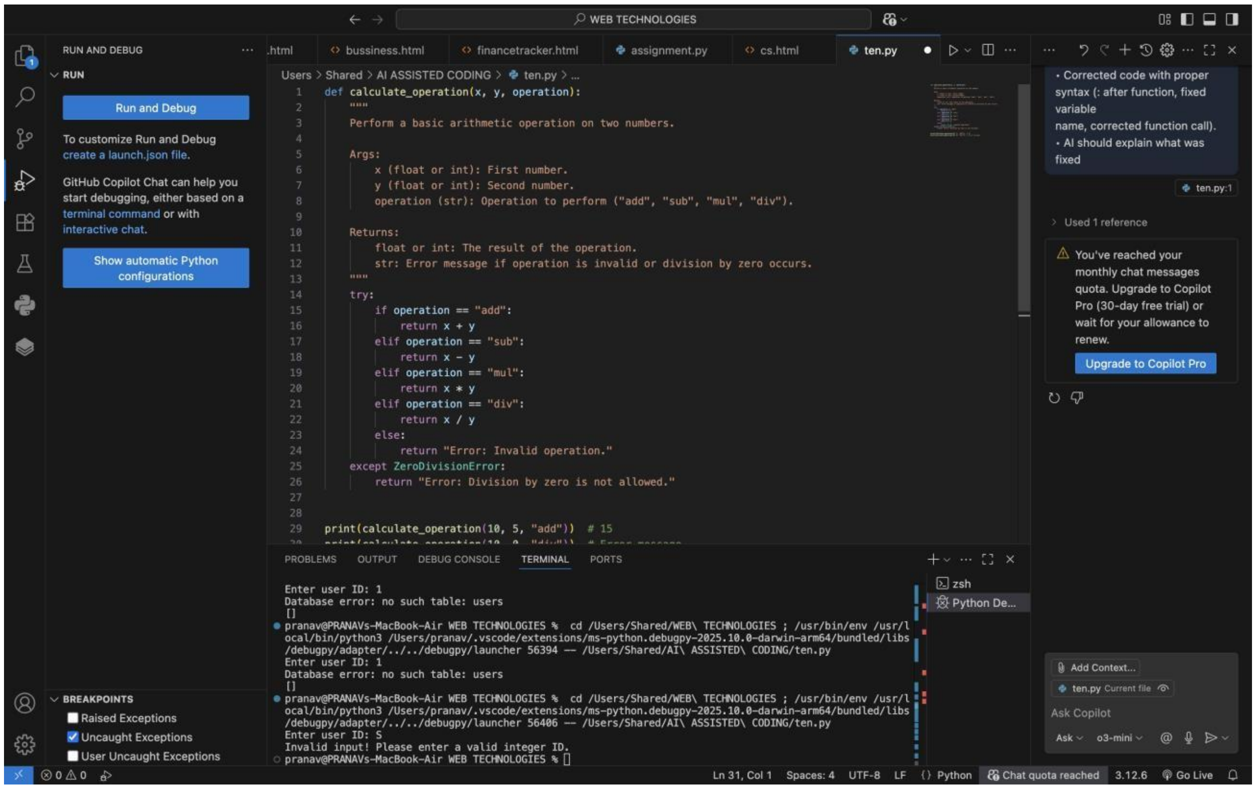
Task 5: Automated Code Review Report Generation
Task: Generate a review report for this messy code.
# buggy_code_task5.py

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

PROMPT USED : WRITE A SIMPLE AND FORMATED REVIEW REPORT OF THE CODE

REGENERATED CODE :


```python
def calculate_operation(x, y, operation):
    """
    Perform a basic arithmetic operation on two numbers.

    Args:
        x (float or int): First number.
        y (float or int): Second number.
        operation (str): Operation to perform ("add", "sub", "mul", "div").

    Returns:
        float or int: The result of the operation.
        str: Error message if operation is invalid or division by zero occurs.
    """
    try:
        if operation == "add":
            return x + y
        elif operation == "sub":
            return x - y
        elif operation == "mul":
            return x * y
        elif operation == "div":
            return x / y
        else:
            return "Error: Invalid operation."
    except ZeroDivisionError:
        return "Error: Division by zero is not allowed."


print(calculate_operation(10, 5, "add"))  # 15
```

```
Enter user ID: 1
Database error: no such table: users
[]
pranav@PRANAVs-MacBook-Air WEB TECHNOLOGIES %  cd /Users/Shared/WEB\ TECHNOLOGIES ; /usr/bin/env /usr/l
ocal/bin/python3 /Users/pranav/.vscode/extensions/ms-python.debugpy-2025.10.0-darwin-arm64/bundled/libs
/debugpy/adapter/../../debugpy/launcher 56394 -- /Users/Shared/AI\ ASSISTED\ CODING/ten.py
Enter user ID: 1
Database error: no such table: users
[]
pranav@PRANAVs-MacBook-Air WEB TECHNOLOGIES %  cd /Users/Shared/WEB\ TECHNOLOGIES ; /usr/bin/env /usr/l
ocal/bin/python3 /Users/pranav/.vscode/extensions/ms-python.debugpy-2025.10.0-darwin-arm64/bundled/libs
/debugpy/adapter/../../debugpy/launcher 56406 -- /Users/Shared/AI\ ASSISTED\ CODING/ten.py
Enter user ID: S
Invalid input! Please enter a valid integer ID.
pranav@PRANAVs-MacBook-Air WEB TECHNOLOGIES % 
```

• Corrected code with proper syntax (: after function, fixed variable
name, corrected function call).
• AI should explain what was fixed

ten.py:1

Used 1 reference

You've reached your monthly chat messages quota. Upgrade to Copilot Pro (30-day free trial) or wait for your allowance to renew.

Upgrade to Copilot Pro
Run and Debug
Show automatic Python configurations
Ln 31, Col 1 Spaces: 4 UTF-8 LF Python Chat quota reached 3.12.6 Go Live

Automated Code Review Report

File: buggy_code_task5.py

1. Syntax s Formatting Issues

- **Indentation:** The function body is not indented properly, which makes the code harder to read.
- **Inconsistent formatting:** Some branches use inline return (e.g., elif z=="sub": return x-y) while others use block formatting.

- **PEP 8 compliance**: Missing spaces around operators (should be x + y, not x+y).

2. Readability Issues

- **Function name**: calc is vague. A more descriptive name like calculate_operation is recommended.
- **Variable name**: z does not describe its purpose; use something like operation.
- **Docstrings**: No documentation provided. The function should explain parameters, possible operations, and return values.

3. Logical / Runtime Issues

- **Division by zero**: No error handling when dividing by zero → causes a ZeroDivisionError.
- **Invalid operation handling**: Prints "wrong" but still returns None, which may break code depending on function return value expectations.

4. Performance Concerns

- Performance is acceptable for this simple function.
- No redundant loops or heavy computation.

5. Security Concerns

- None for this code since no external input is directly executed (unlike SQL).

- However, lack of input validation could cause runtime crashes (e.g., non-numeric input passed in).

6. Recommendations

🟩 Refactor code for readability and maintainability:

- Rename function → calculate_operation.
- Rename variable z → operation.
- Add docstring with parameter/return info.
- Use consistent formatting and spacing (PEP 8).
- Add try-except for division by zero.
- Return a clear error message for invalid operations instead of printing only.