AI ASSIGNMENT-7.4

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Task Description #1:

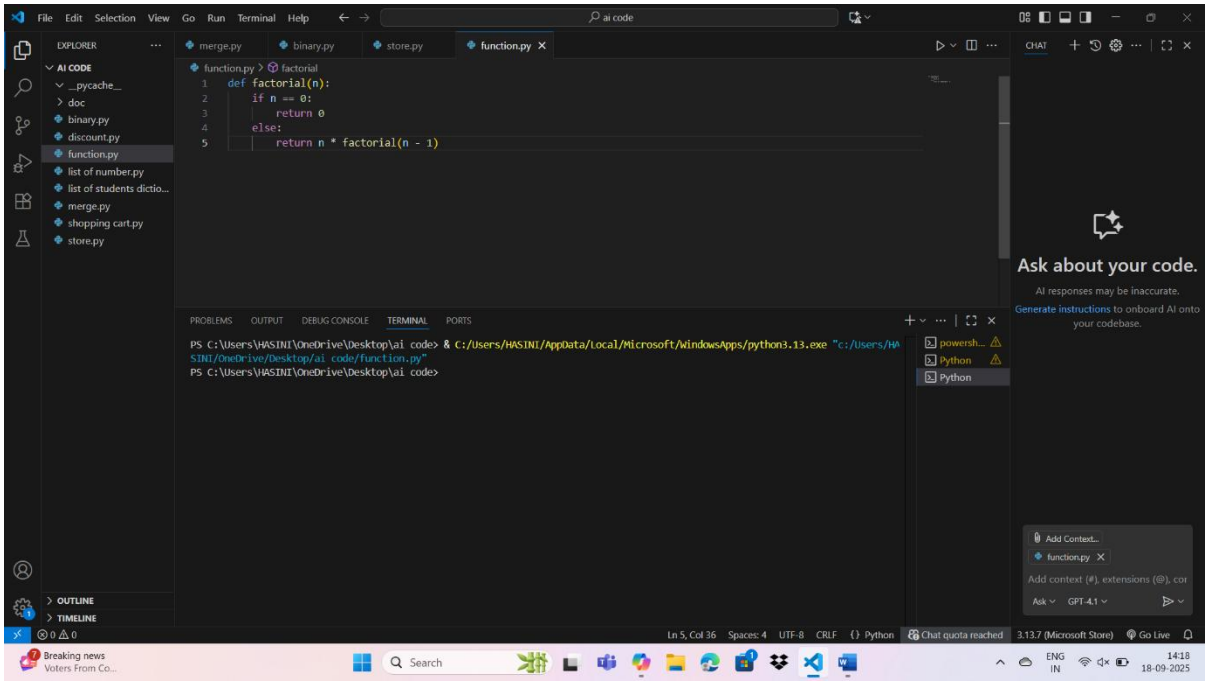
• Introduce a buggy Python function that calculates the factorial of a number using recursion. Use Copilot or Cursor AI to detect and fix the logical or syntax errors.

Expected Outcome #1:

• Copilot or Cursor AI correctly identifies missing base condition or incorrect recursive call and suggests a functional factorial implementation.

OUTPUT:

BUGGY CODE:



CORRECTED CODE:

```python
def factorial(n):
    if n <0:
        raise ValueError("factorial is not defined for negative numbers.")
    elif n==0 or n==1:
        return 1
    else:
        return n * factorial(n - 1)
try:
    num=int(input('enter a non negative integer:'))
    print(f"factorial of {num} is {factorial(num)}")
except ValueError as e:
    print("error:",e)
```

```
enter a non negative integer:6
factorial of 6 is 720
PS C:\Users\HASINI\OneDrive\Desktop\ai code>
```

OBSERVATION: Negative inputs cause infinite recursion and eventually a RecursionError.AI generated a corrected code with error exception which does not allow negative values.

- Returning 0 for n == 0 contradicts the mathematical definition of factorial(0) =1
- **Correct Base Case**: Returns 1 for both 0 and 1, aligning with factorial rules

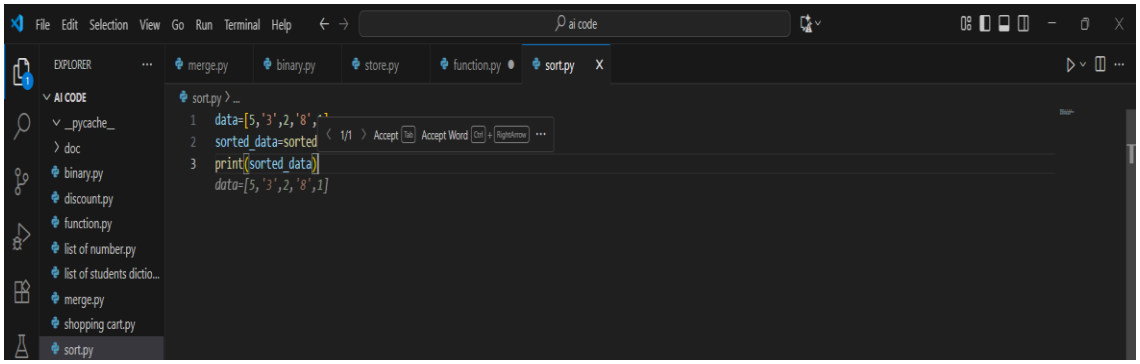
Task Description #2:

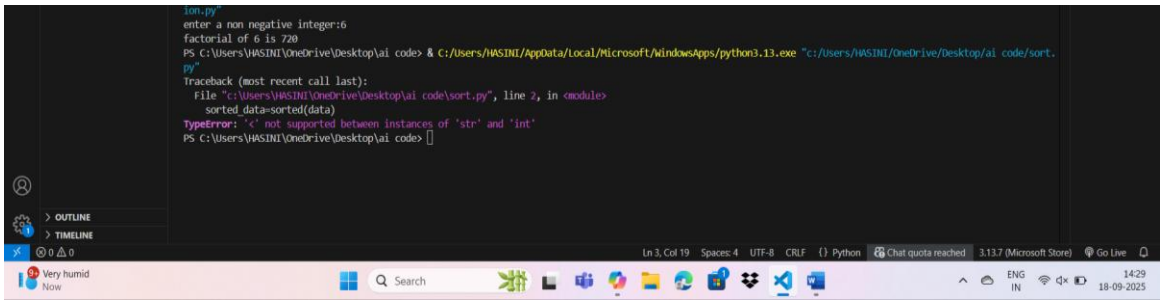
• Provide a list sorting function that fails due to a type error (e.g., sorting list with mixed integers and strings). Prompt AI to detect the issue and fix the code for consistent sorting.

Expected Outcome #2:

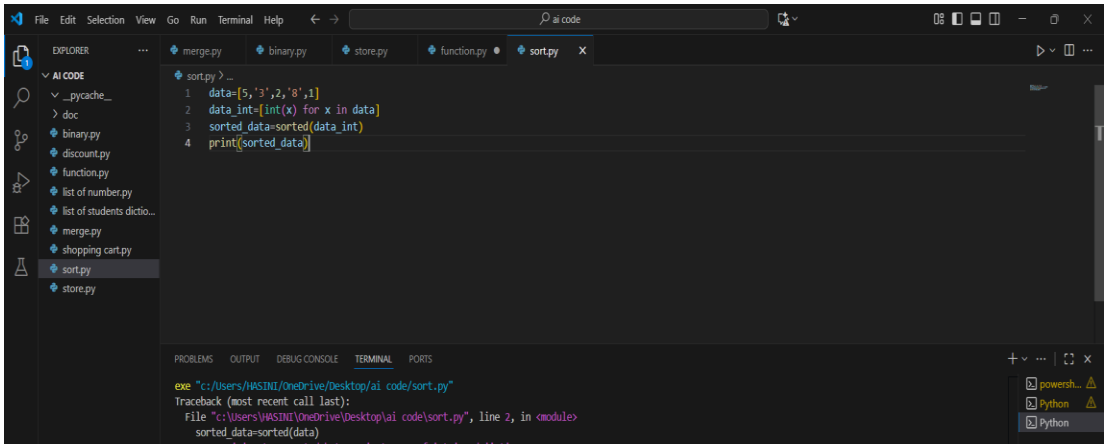
• AI detects the type inconsistency and either filters or converts list elements, ensuring successful sorting without a crash.

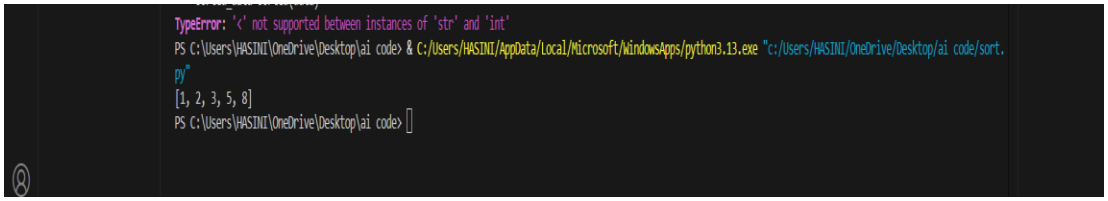
BUGGY CODE:





CORRECTED CODE:





OBSERVATION:Mixed datatypes are given as input.AI has converted them into one datatype and sorted the data.

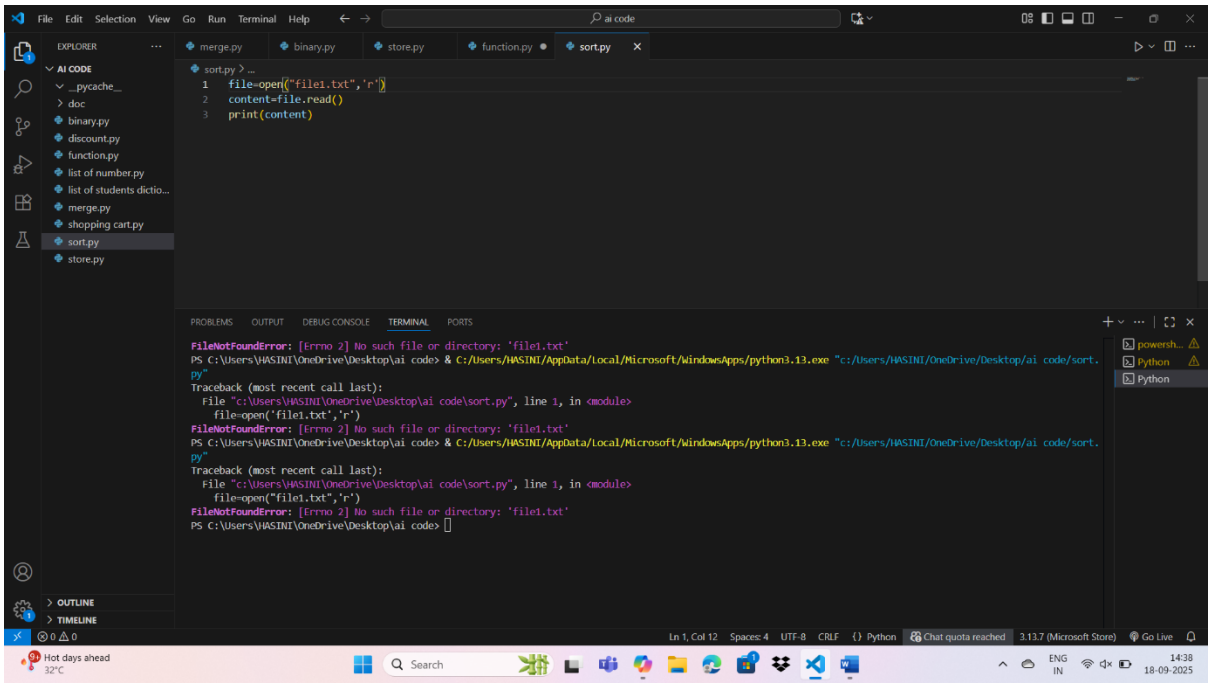
Task Description #3:

• Write a Python snippet for file handling that opens a file but forgets to close it. Ask Copilot or Cursor AI to improve it using the best practice (e.g., with open() block).

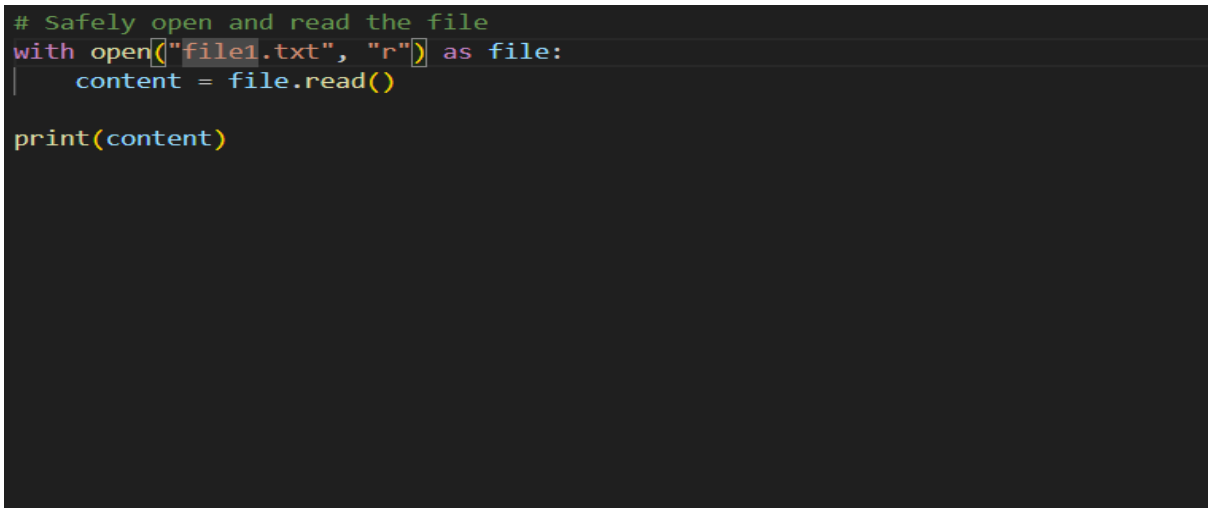
Expected Outcome #3:

• AI refactors the code to use a context manager, preventing resource leakage and runtime warnings.

BUGGY CODE:



CORRECTED CODE:



```python
# Safely open and read the file
with open("file1.txt", "r") as file:
    content = file.read()

print(content)
```

```
PS C:\today>  c:; cd 'c:\today'; & 'c:\Program Files\Python313\python.exe' 'c:\Users\ADHARSH\.vscode\
extensions\ms-python.debugpy-2025.10.0-win32-x64\bundled\libs\debugpy\launcher' '53058' '--' 'c:\toda
y\seven-3.py'
print("hello world")
print("this is me")hello widget
```

OBSERVATION:

The file.close() is missing so, file remains open after reading, which can:

Leak system resources,Lock the file (especially on Windows),

Trigger runtime warnings or errors in larger applications

No Exception Handling: If the file doesn't exist or can't be read, the code will crash without a fallback.

Using a Context Manager (with open):

Automatically closes the file when the block exits—even if an error occurs

Prevents resource leakage and improves reliability.

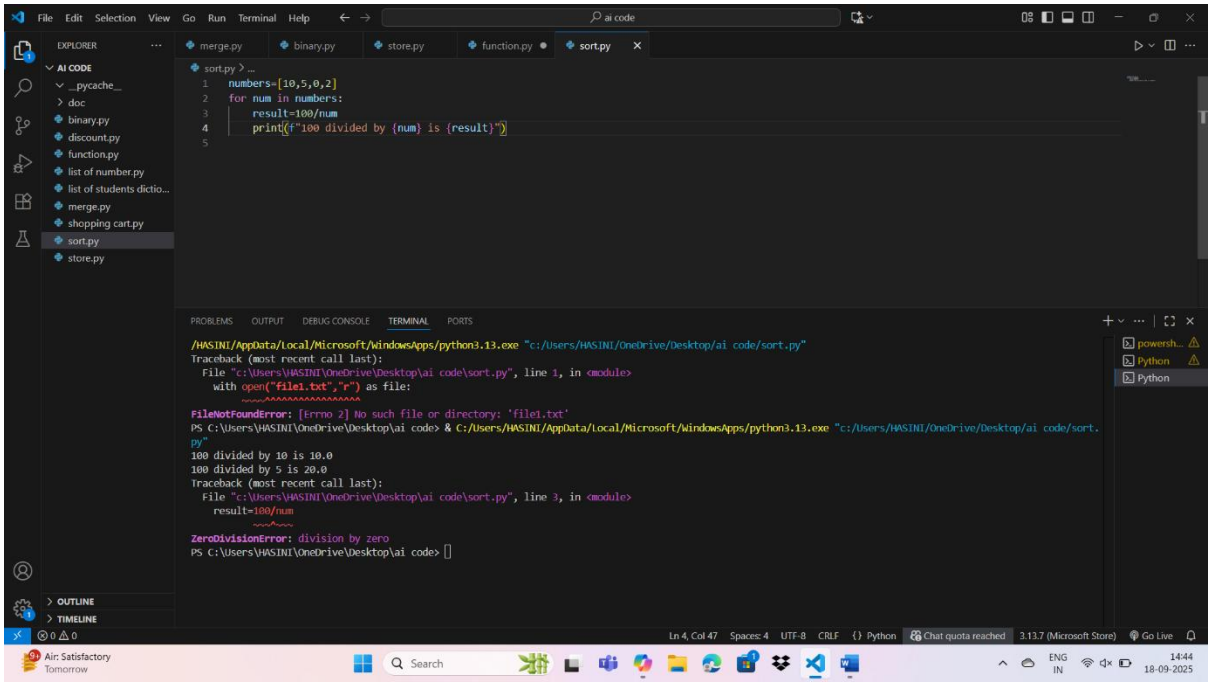
Task Description #4:

• Provide a piece of code with a ZeroDivisionError inside a loop. Ask AI to add error handling using try-except and continue execution safely.

Expected Outcome #4:

• Copilot adds a try-except block around the risky operation, preventing crashes and printing a meaningful error message.

BUGGY CODE:



CORRECTED CODE:

```python
numbers = [10, 5, 0, 2]

for num in numbers:
    try:
        result = 100 / num
        print(f"100 divided by {num} is {result}")
    except ZeroDivisionError:
        print(f"Cannot divide by zero when num = {num}. Skipping...")
```

```
PS C:\today>  c:; cd 'c:\today'; & 'c:\Program Files\Python313\python.exe' 'c:\Users\ADHARSH\.vscode\extensions\ms-python.debugpy-2025.10.0-win32-x64\bundled\libs\debugpy\launcher' '54730' '--' 'c:\today\seven-4.py'
100 divided by 10 is 10.0
100 divided by 5 is 20.0
Cannot divide by zero when num = 0. Skipping...
100 divided by 2 is 50.0
```

OBSERVATION:

There is no Error Handling.

Poor User Feedback: No indication of what went wrong or which value caused the issue.

Try Except block added:isolates risky operation and catches the specific error.

Improved Feedback: Prints a clear message when an error occurs, aiding debugging and user understanding.

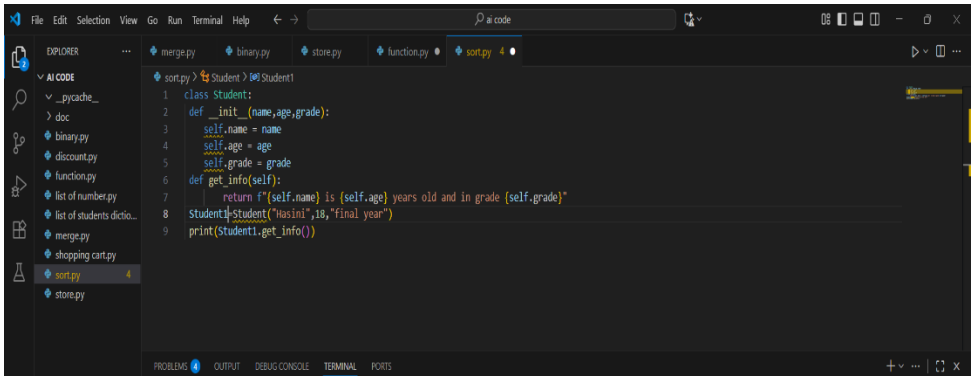
Task Description #5:

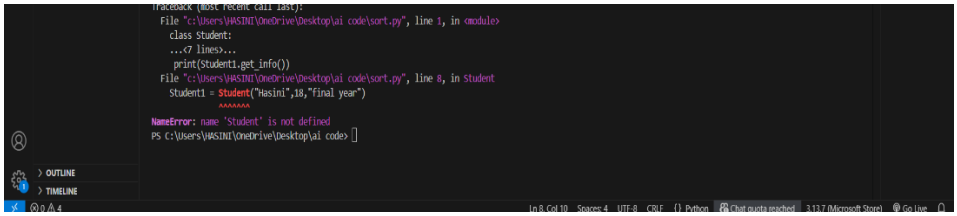
• Include a buggy class definition with incorrect __init__ parameters or attribute references. Ask AI to analyze and correct the constructor and attribute usage.

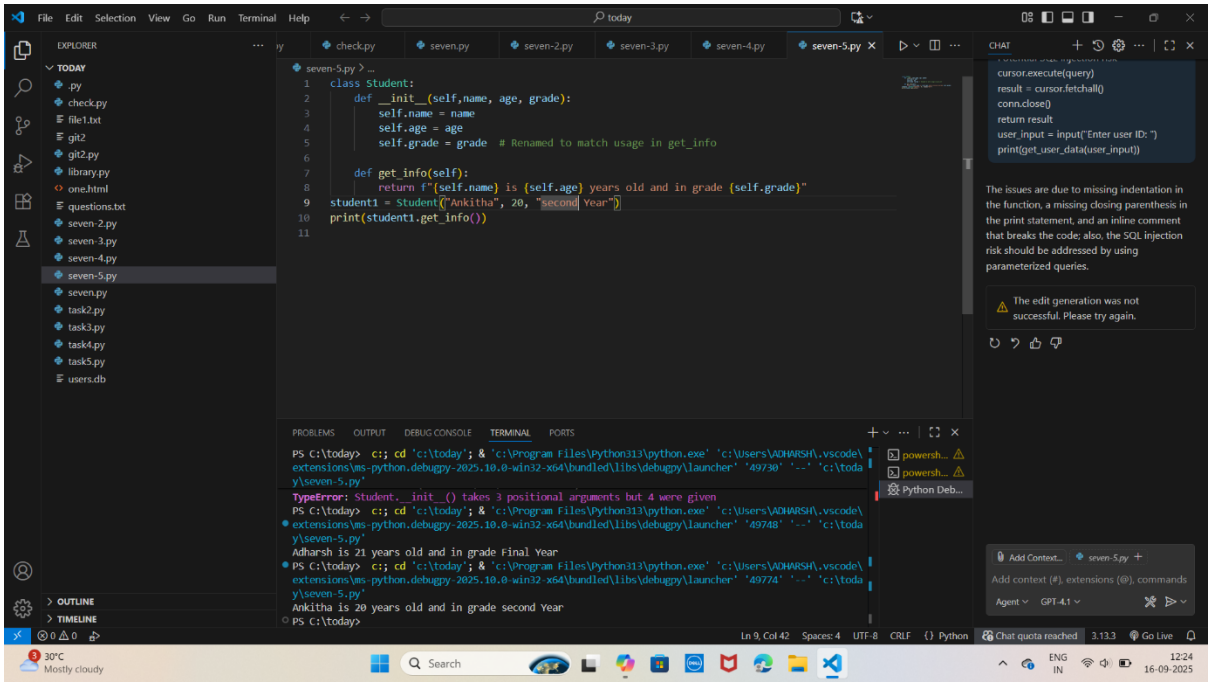
Expected Outcome #5:

• Copilot identifies mismatched parameters or missing self references and rewrites the class with accurate initialization and usage.

BUGGY CODE:







OBSERVATION:

- Missing self in __init__ parameters: Python requires self as the first argument in instance methods to refer to the object itself.
- self is the reference to the current instance—required in all instance methods.