Assignment – 2.5

AI Assisted Coding

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Batch - 04

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Task 1: Refactoring Odd/Even Logic (List Version)

❖ Scenario:

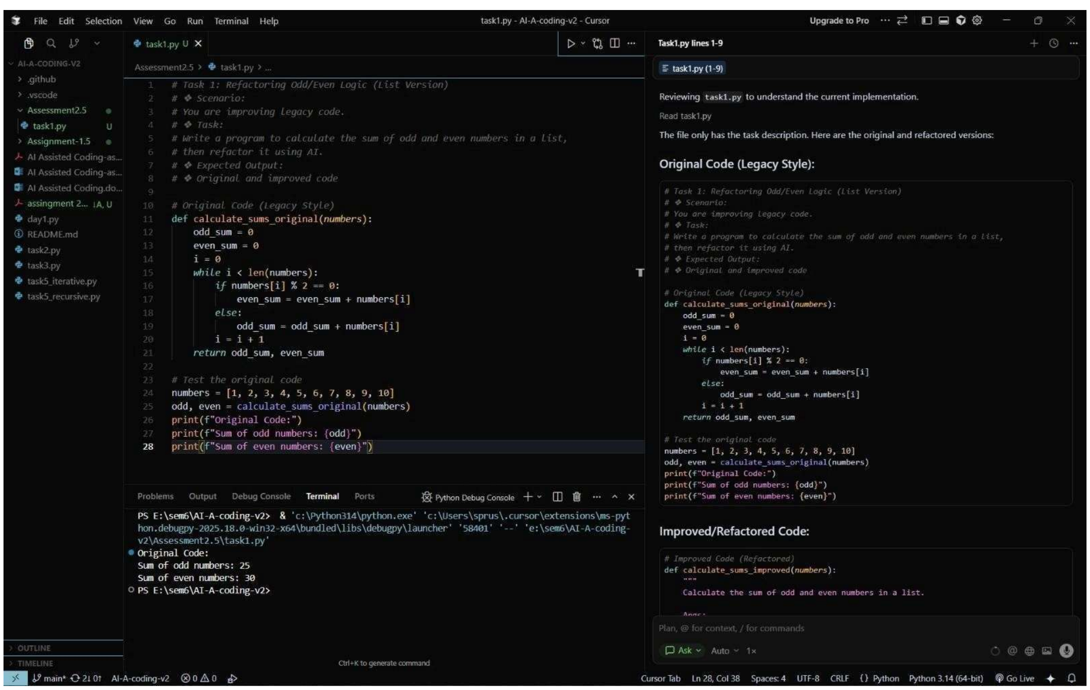
You are improving legacy code.

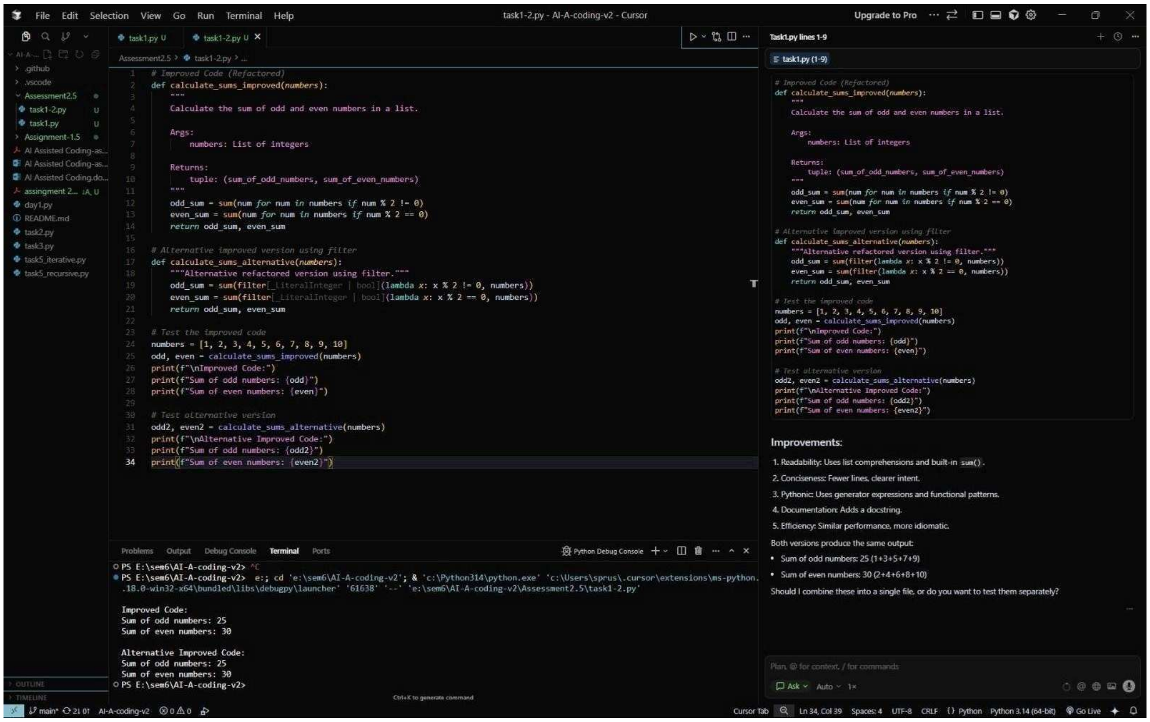
❖ Task:

Write a program to calculate the sum of odd and even numbers in a list, then refactor it using AI.

❖ Expected Output:

❖ Original and improved code





Task 2: Area Calculation Explanation

❖ Scenario:

You are onboarding a junior developer.

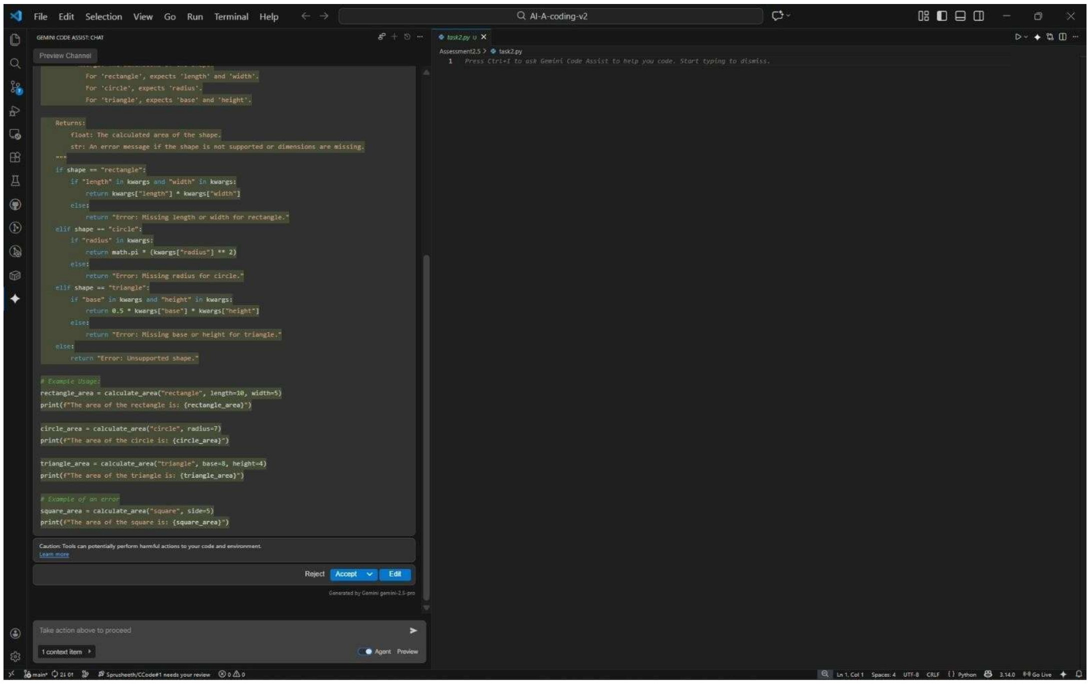
❖ Task:

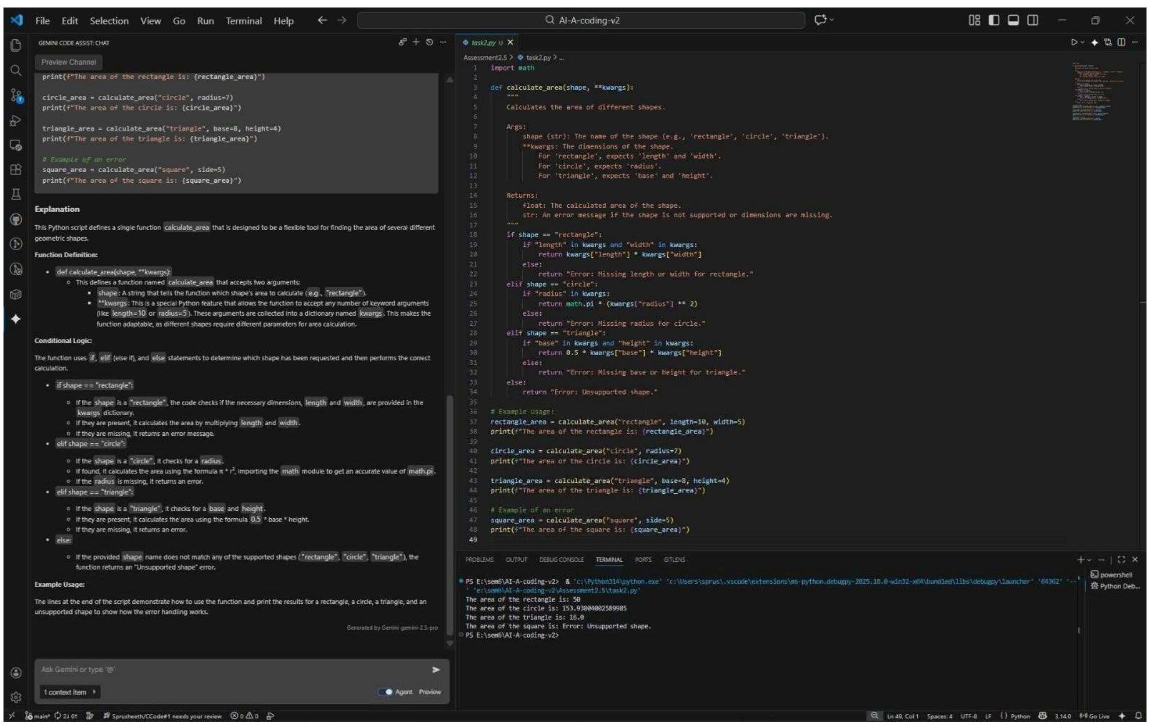
Ask Gemini to explain a function that calculates the area of different shapes.

❖ Expected Output:

➢ Code

➢ Explanation





Explanation

This Python script defines a single function calculate_area that is designed to be a flexible tool for finding the area of several different geometric shapes.

Function Definition:

def calculate_area(shape, **kwargs):

This defines a function named calculate_area that accepts two arguments:

shape: A string that tells the function which shape's area to calculate (e.g., "rectangle").

**kwargs: This is a special Python feature that allows the function to accept any number of keyword arguments (like length=10 or radius=5). These arguments are collected into a dictionary named kwargs. This makes the function adaptable, as different shapes require different parameters for area calculation.

Conditional Logic:

The function uses if, elif (else if), and else statements to determine which shape has been requested and then performs the correct calculation.

if shape == "rectangle":

If the shape is a "rectangle", the code checks if the necessary dimensions, length and width, are provided in the kwargs dictionary.
If they are present, it calculates the area by multiplying length and width.

If they are missing, it returns an error message.

elif shape == "circle":

If the shape is a "circle", it checks for a radius.

If found, it calculates the area using the formula $\pi * r^2$, importing the math module to get an accurate value of math.pi. If the radius is missing, it returns an error. elif shape == "triangle":

If the shape is a "triangle", it checks for a base and height.

If they are present, it calculates the area using the formula 0.5 * base * height.

If they are missing, it returns an error.

else:

If the provided shape name does not match any of the supported shapes ("rectangle", "circle", "triangle"), the function returns an "Unsupported shape" error.

Example Usage:

The lines at the end of the script demonstrate how to use the function and print the results for a rectangle, a circle, a triangle, and an unsupported shape to show how the error handling works.

Task 3: Prompt Sensitivity Experiment

❖ Scenario:

You are testing how AI responds to different prompts.

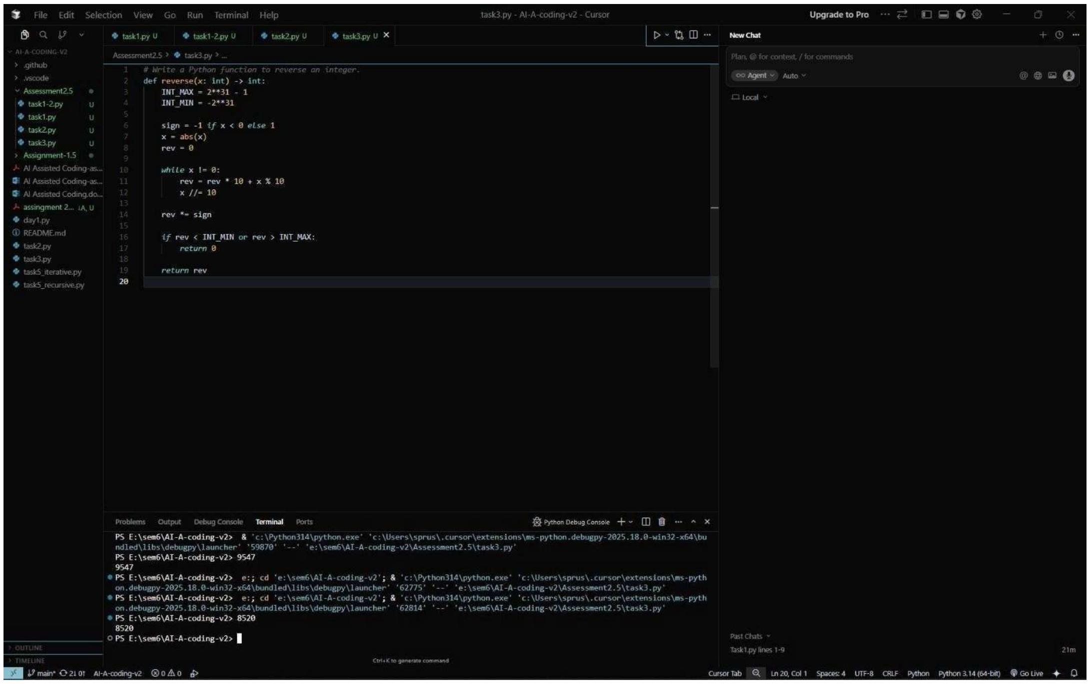
❖ Task:

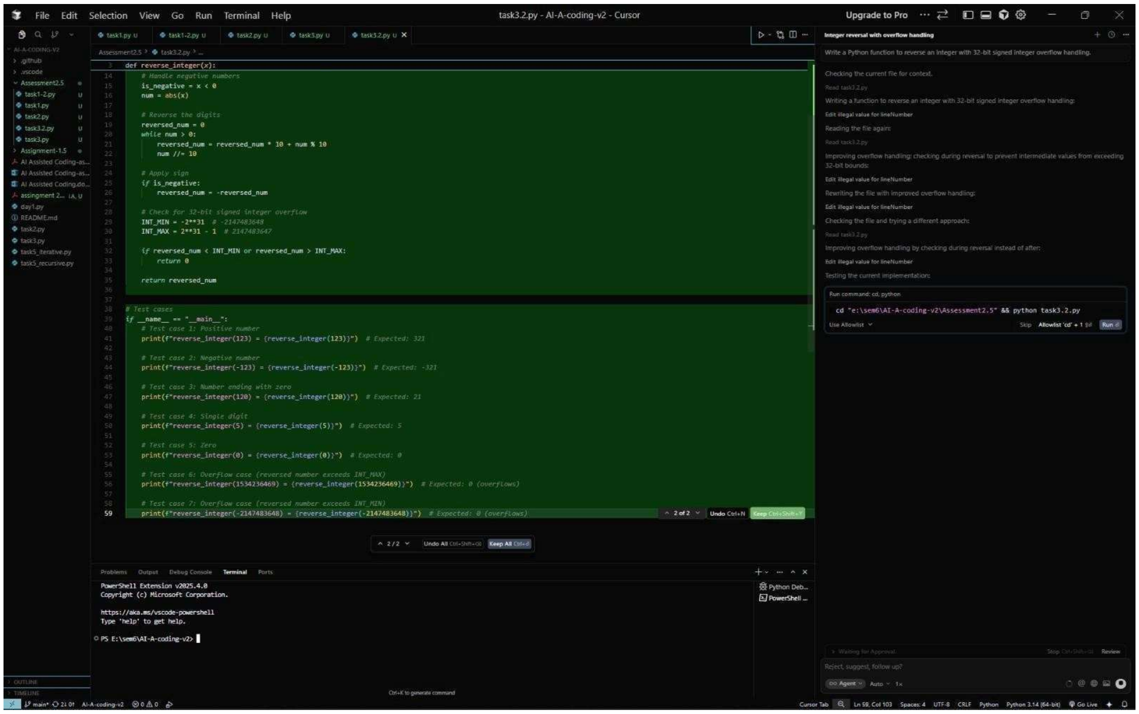
Use Cursor AI with different prompts for the same problem and observe code changes.

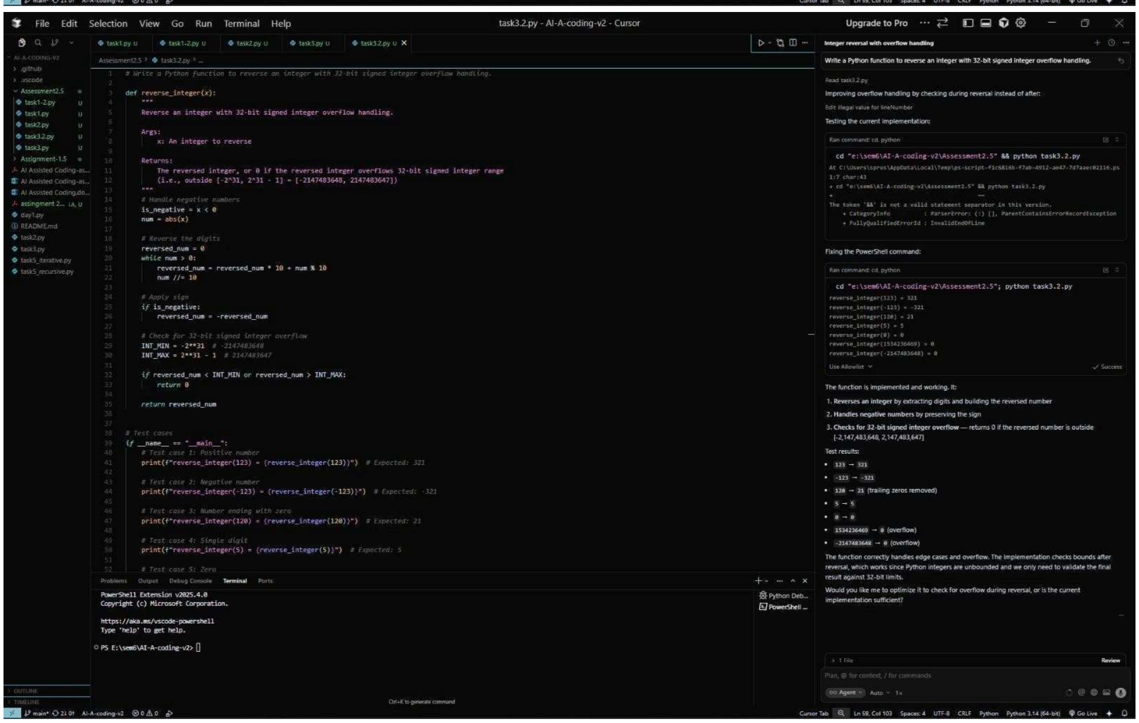
❖ Expected Output:

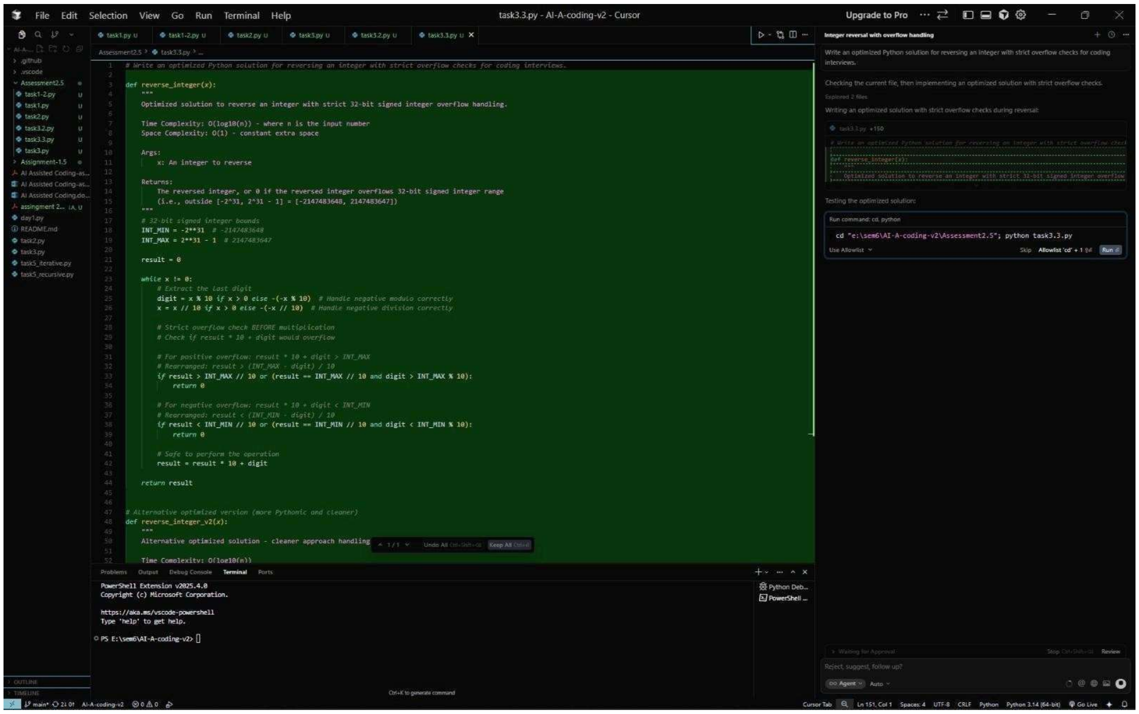
➢ Prompt list

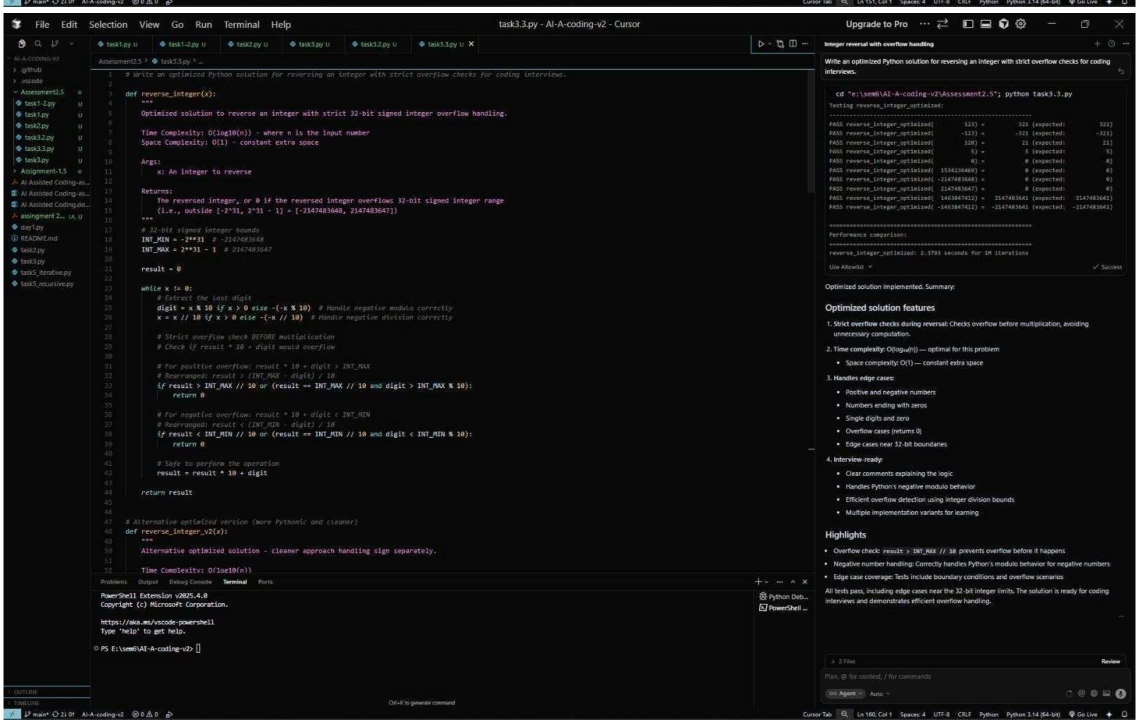
➢ Code variations




File Edit Selection View Go Run Terminal Help
task3.2.py - AI-A-coding-v2 - Cursor
Upgrade to Pro
def reverse_integer(x):
# Handle negative numbers
is_negative = x < 0
num = abs(x)
# Reverse the digits
reversed_num = 0
while num > 0:
reversed_num = reversed_num * 10 + num % 10
num //= 10
# Apply sign
if is_negative:
reversed_num = -reversed_num
# Check for 32-bit signed integer overflow
INT_MIN = -2**31 # -2147483648
INT_MAX = 2**31 - 1 # 2147483647
if reversed_num < INT_MIN or reversed_num > INT_MAX:
return 0
return reversed_num
# Test cases
if __name__ == "__main__":
Integer reversal with overflow handling
Write a Python function to reverse an integer with 32-bit signed integer overflow handling.
Checking the current file for context.
Read task3.2.py
Writing a function to reverse an integer with 32-bit signed integer overflow handling:
Edit illegal value for lineNumber
Reading the file again:
Read task3.2.py
Improving overflow handling: checking during reversal to prevent intermediate values from exceeding 32-bit bounds:
Edit illegal value for lineNumber
Rewriting the file with improved overflow handling:
Edit illegal value for lineNumber
Checking the file and trying a different approach:
Read task3.2.py
Improving overflow handling by checking during reversal instead of after:
Edit illegal value for lineNumber
Testing the current implementation:
Run command: cd, python
cd "e:\sem6\AI-A-coding-v2\Assessment2.5" && python task3.2.py
Use Allowlist
Skip
Allowlist 'cd' + 1
Run
PowerShell Extension v2025.4.0
Copyright (c) Microsoft Corporation.
https://aka.ms/vscode-powershell
Type 'help' to get help.
PS E:\sem6\AI-A-coding-v2>


File Edit Selection View Go Run Terminal Help
task3.2.py - AI-A-coding-v2 - Cursor
Upgrade to Pro
# Write a Python function to reverse an integer with 32-bit signed integer overflow handling.
def reverse_integer(x):
"""
Reverse an integer with 32-bit signed integer overflow handling.
Args:
x: An integer to reverse
Returns:
The reversed integer, or 0 if the reversed integer overflows 32-bit signed integer range
(i.e., outside [-2^31, 2^31 - 1] = [-2147483648, 2147483647])
"""
# Handle negative numbers
is_negative = x < 0
num = abs(x)
# Reverse the digits
reversed_num = 0
while num > 0:
reversed_num = reversed_num * 10 + num % 10
num //= 10
# Apply sign
if is_negative:
reversed_num = -reversed_num
# Check for 32-bit signed integer overflow
INT_MIN = -2**31 # -2147483648
INT_MAX = 2**31 - 1 # 2147483647
if reversed_num < INT_MIN or reversed_num > INT_MAX:
return 0
return reversed_num
# Test cases
if __name__ == "__main__":
# Test case 1: Positive number
print(f"reverse_integer(123) = {reverse_integer(123)}") # Expected: 321
Test case 2: Negative number
print(f"reverse_integer(-123) = {reverse_integer(-123)}") # Expected: -321
Test case 3: Number ending with zero
print(f"reverse_integer(120) = {reverse_integer(120)}") # Expected: 21
Test case 4: Single digit
print(f"reverse_integer(5) = {reverse_integer(5)}") # Expected: 5
Test case 5: Zero
Integer reversal with overflow handling
Write a Python function to reverse an integer with 32-bit signed integer overflow handling.
Read task3.2.py
Improving overflow handling by checking during reversal instead of after:
Edit illegal value for lineNumber
Testing the current implementation:
Ran command: cd, python
cd "e:\sem6\AI-A-coding-v2\Assessment2.5" && python task3.2.py
The token '&&' is not a valid statement separator in this version.
Fixing the PowerShell command:
Ran command: cd, python
cd "e:\sem6\AI-A-coding-v2\Assessment2.5"; python task3.2.py
reverse_integer(123) = 321
reverse_integer(-123) = -321
reverse_integer(120) = 21
reverse_integer(5) = 5
reverse_integer(0) = 0
reverse_integer(1534236469) = 0
reverse_integer(-2147483648) = 0
Success
The function is implemented and working. It:
1. Reverses an integer by extracting digits and building the reversed number
2. Handles negative numbers by preserving the sign
3. Checks for 32-bit signed integer overflow — returns 0 if the reversed number is outside [-2,147,483,648, 2,147,483,647]
Test results:
123 → 321
-123 → -321
120 → 21 (trailing zeros removed)
5 → 5
0 → 0
1534236469 → 0 (overflow)
-2147483648 → 0 (overflow)
The function correctly handles edge cases and overflow. The implementation checks bounds after reversal, which works since Python integers are unbounded and we only need to validate the final result against 32-bit limits.
Would you like me to optimize it to check for overflow during reversal, or is the current implementation sufficient?
PowerShell Extension v2025.4.0
Copyright (c) Microsoft Corporation.
https://aka.ms/vscode-powershell
Type 'help' to get help.
PS E:\sem6\AI-A-coding-v2>





Task 4: Tool Comparison Reflection

❖ Scenario:

You must recommend an AI coding tool.

❖ Task:

Based on your work in this topic, compare Gemini, Copilot, and Cursor AI for usability and code quality.

❖ Expected Output:

Short written reflection

Based on my experience using Gemini, GitHub Copilot, and Cursor AI during this topic, I observed clear differences in both usability and code quality.

Gemini is useful for understanding concepts and generating explanations, but it often produces generic code unless very strict constraints are provided. It is better suited for learning and problem understanding rather than competitive or production-level coding.

GitHub Copilot integrates smoothly with IDEs like VS Code and provides fast, context-aware code suggestions. However, its outputs sometimes assume the developer will handle edge cases, so overflow handling and constraints may be missed unless explicitly guided.

Cursor AI provided the best balance of usability and code quality. It allows direct interaction with the codebase, understands existing files, and responds well to detailed prompts. When constraints are clearly mentioned, Cursor AI consistently generated correct, optimized, and readable code, making it ideal for real development and debugging tasks.

Conclusion:

For learning → Gemini

For quick coding assistance → Copilot

For serious development and prompt-based experimentation → Cursor AI