SR UNIVERSITY

AI ASSISTED CODING

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Lab 8: Test-Driven Development with AI – Generating and Working with Test Cases

Lab Objectives:

- To introduce students to test-driven development (TDD) using AI code generation tools.
- To enable the generation of test cases before writing code implementations.
- To reinforce the importance of testing, validation, and error handling.
- To encourage writing clean and reliable code based on AI-generated test expectations.

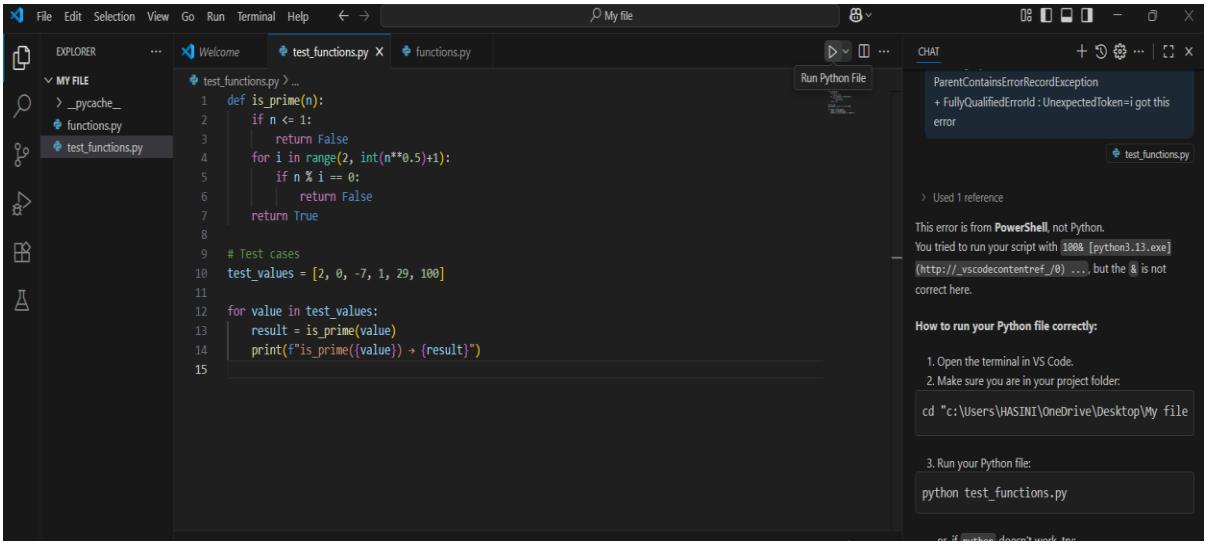
Lab Outcomes (LOs):

After completing this lab, students will be able to:

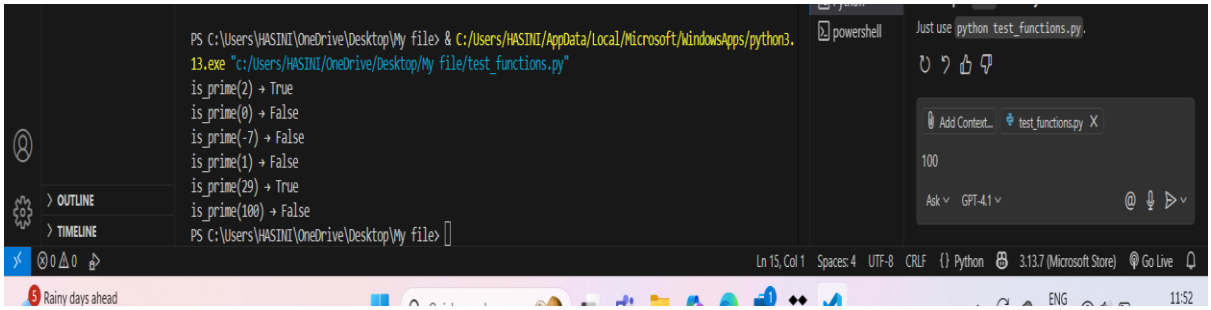
- Use AI tools to write test cases for Python functions and classes.
- Implement functions based on test cases in a test-first development style.
- Use unittest or pytest to validate code correctness.
- Analyze the completeness and coverage of AI-generated tests.
- Compare AI-generated and manually written test cases for quality and logic

Task Description#1
Use AI to generate test cases for a function is_prime(n) and then implement the function.
Requirements:
• Only integers > 1 can be prime.
•Check edge cases: 0, 1, 2, negative numbers, and large primes

CODE:



OUTPUT:



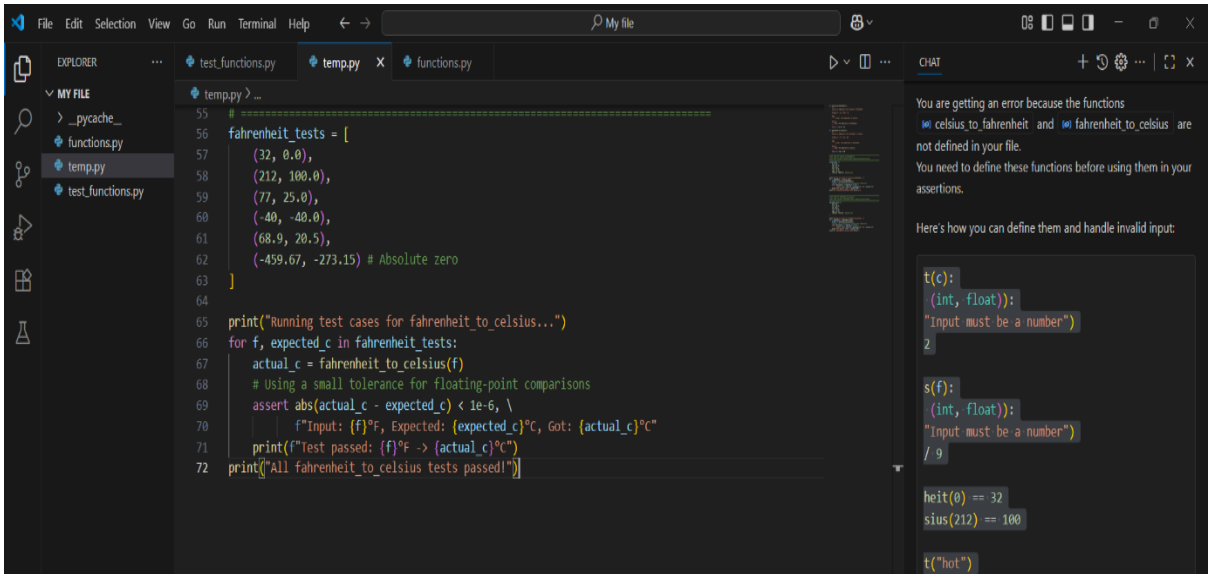
Task2#Description(Loops)

• Ask AI to generate test cases for celsius_to_fahrenheit(c) and fahrenheit_to_celsius(f)

Requirements

• Validate known pairs: 0°C = 32°F, 100°C = 212°F.
• Include decimals and invalid inputs like strings or none.

CODE:



OUTPUT:

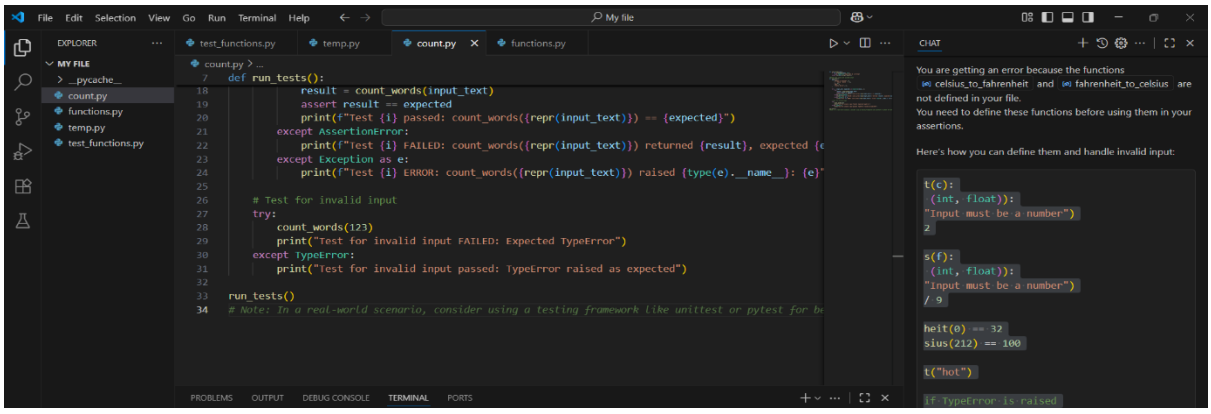
TaskDescription#3

Use AI to write test cases for a function count_words(text) that returns the number of words in a sentence.

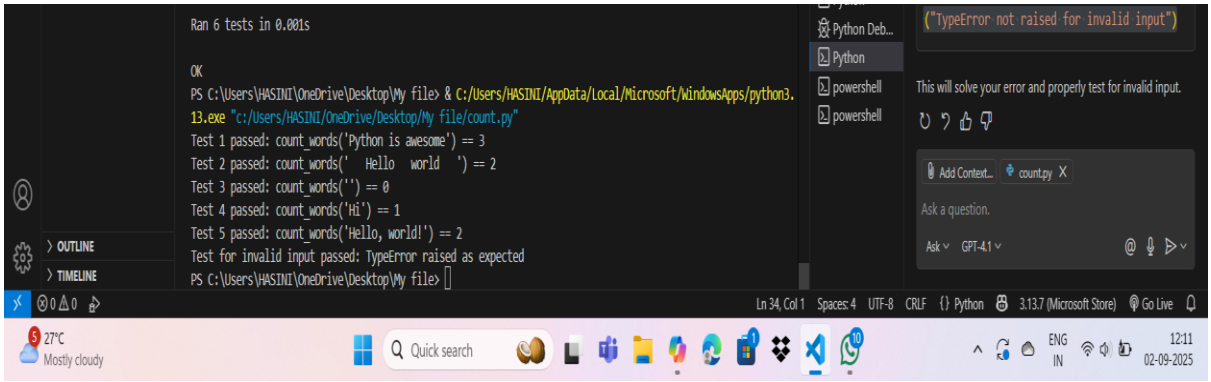
Requirement

Handle normal text, multiple spaces, punctuation, and empty and srings.

CODE:



OUTPUT:



Task Description#4

• Generate test cases for a BankAccount class with:

Methods:

deposit(amount)

withdraw(amount)

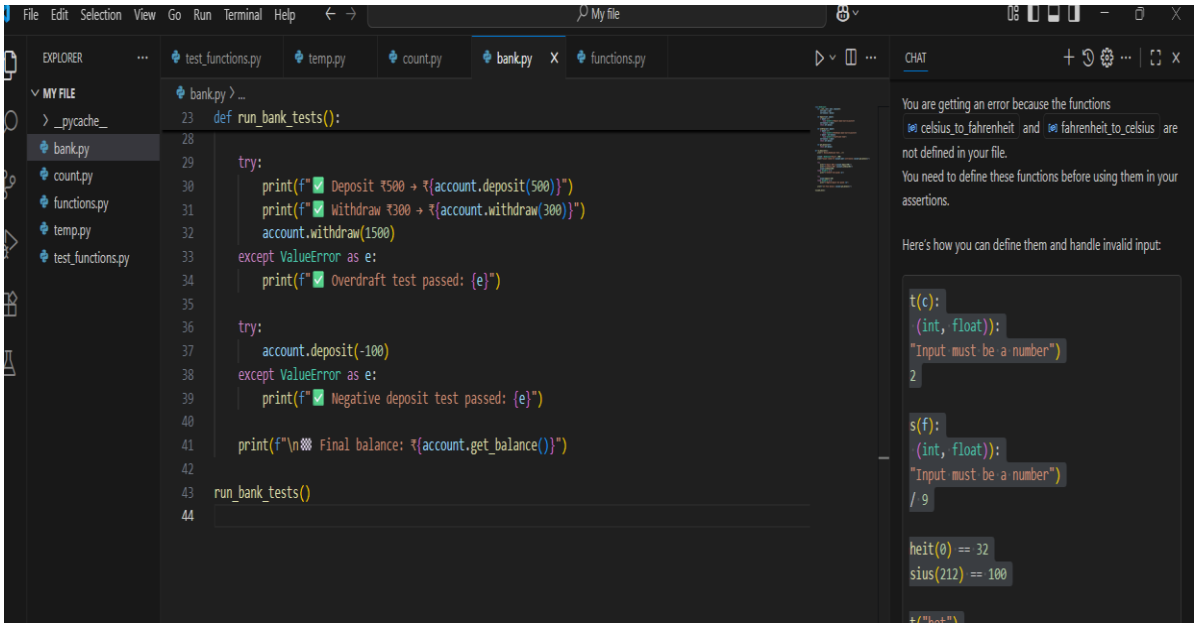
check_balance()

Requirements:

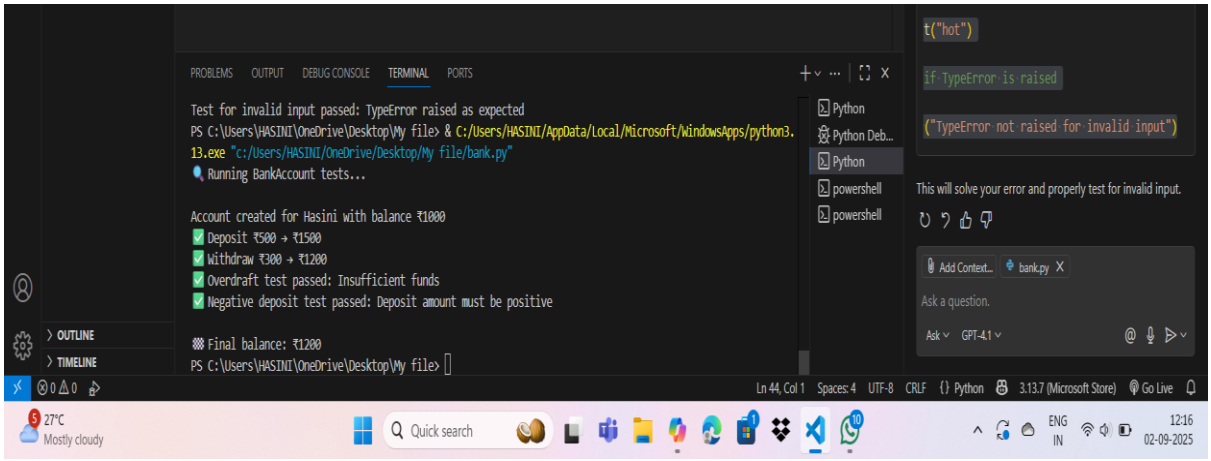
• Negative deposits/withdrawals should raise an error.

• Cannot withdraw more than balance.

CODE:



OUTPUT:



Task Description#5

Generate test cases for is_number_palindrome(num), which checks if an integer reads

the same backward.

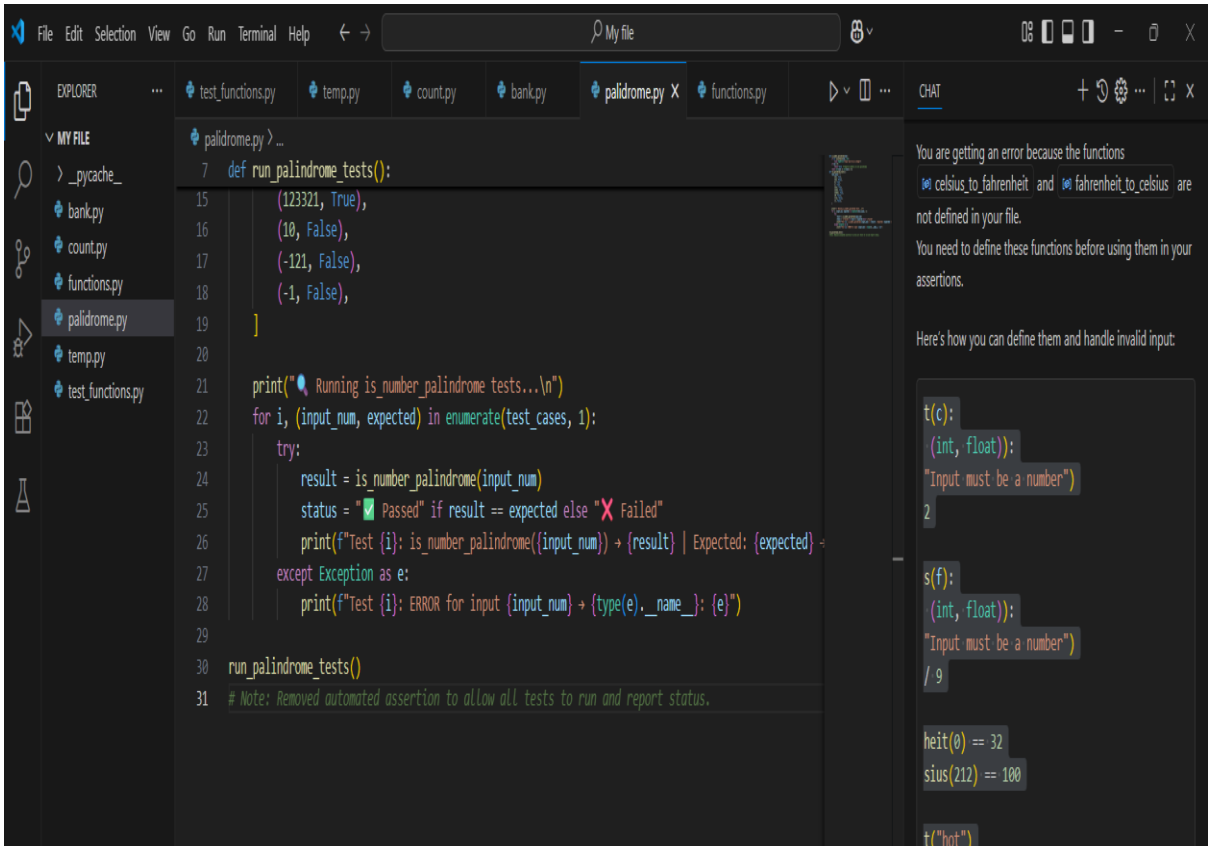
Examples:

121 → True

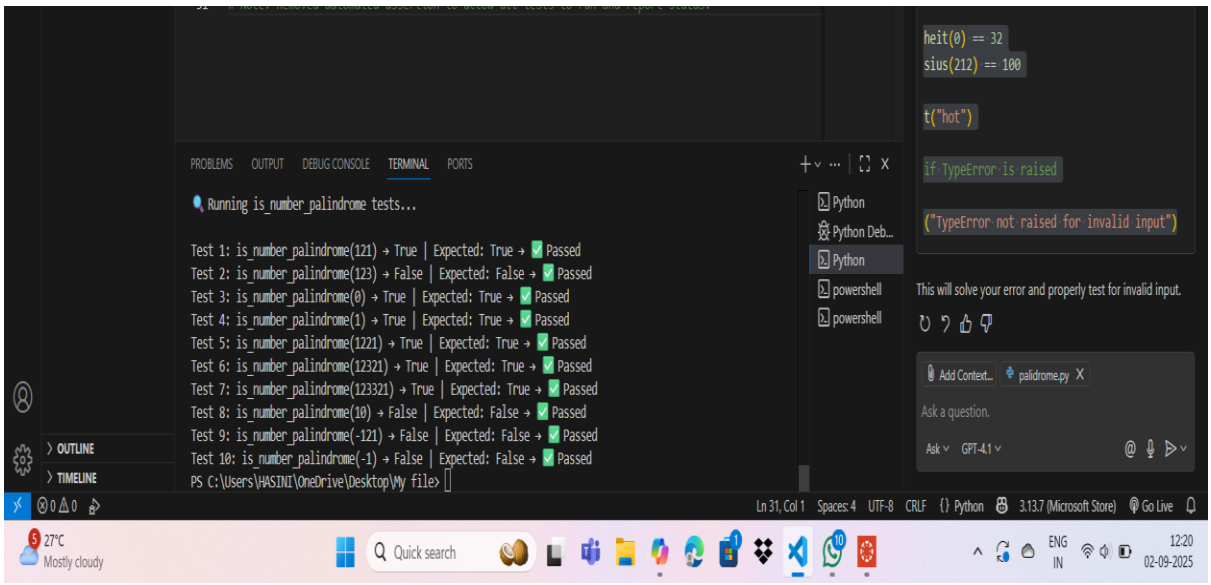
123 → False

0, negative numbers → handled gracefully.

CODE:



OUTPUT:



OBSERVATIONS:

By completing this assignment, I am able to:

- **Use AI tools to write test cases for Python functions and classes.**
- **Implement functions based on test cases in a test-first development style.**
- **Use unittest or pytest to validate code correctness.**
- **Analyze the completeness and coverage of AI-generated tests.**
- **Compare AI-generated and manually written test cases for quality and logic.**