AI ASSISTED CODING

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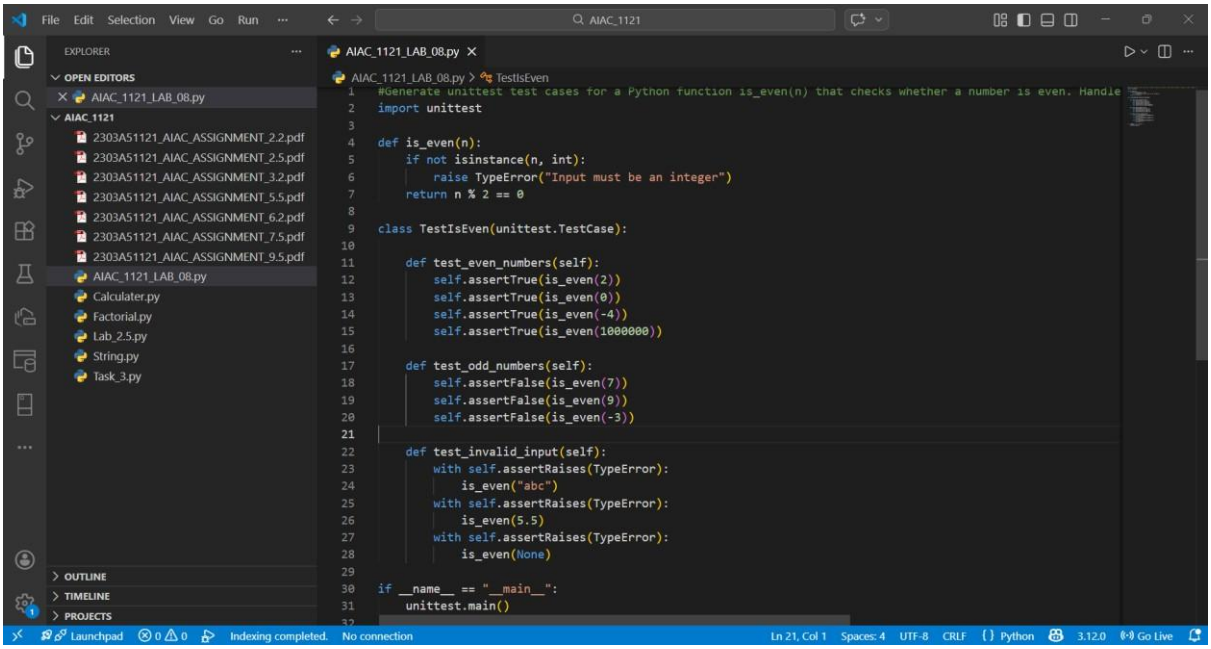
BACTH – 03 **17 – 02 – 2026**

ASSIGNMENT – 08

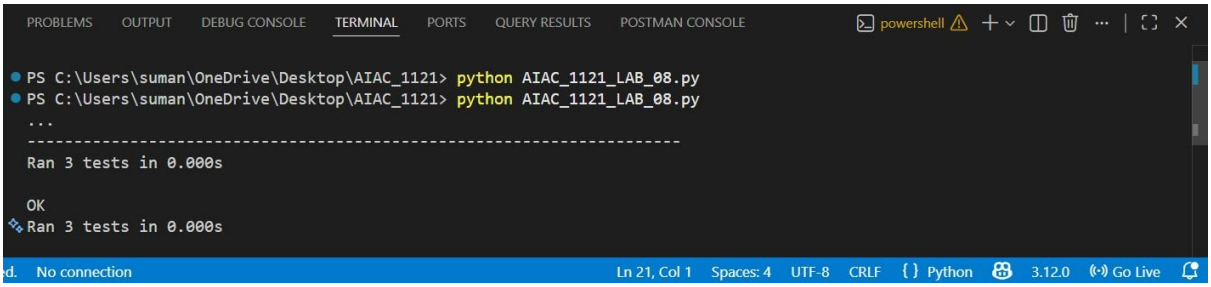
LAB – 08 : Test – Driven Development with AI – Generating and Working with Test Cases.

Task – 01 : Test – Driven Development for Odd/Even Number Validator.

Prompt : Generate unittest test cases for a Python function is_even(n) that checks whether a number is even. Handle zero, negative numbers, large integers, and invalid input. **Code :**



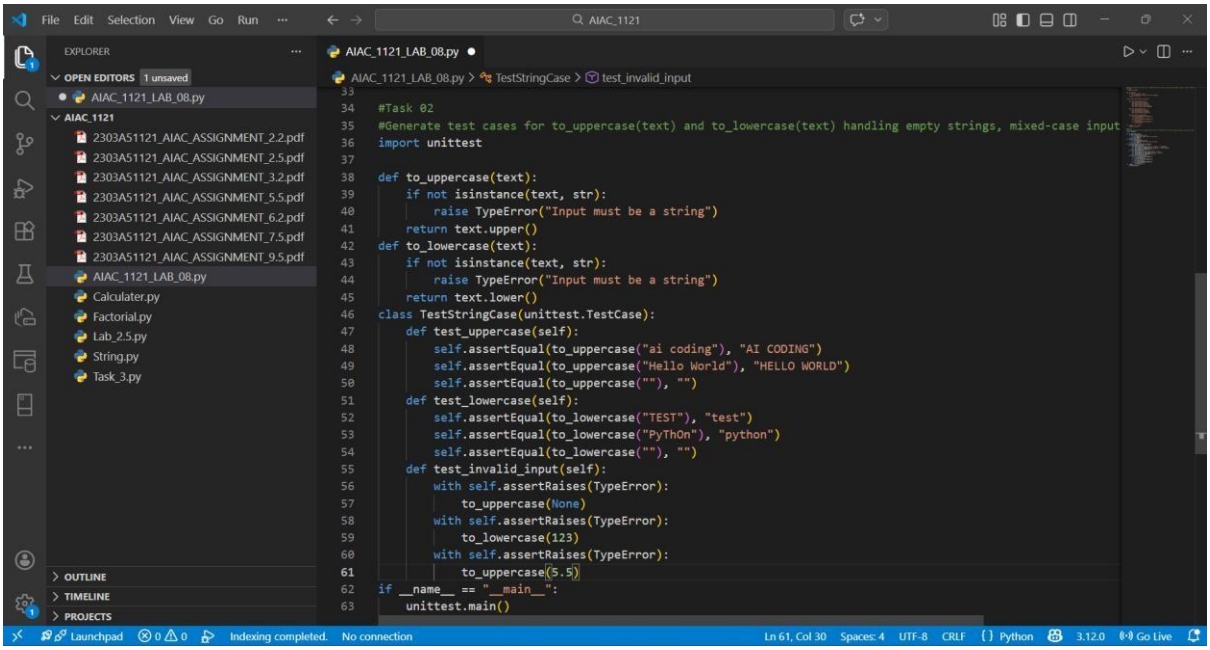
Output :



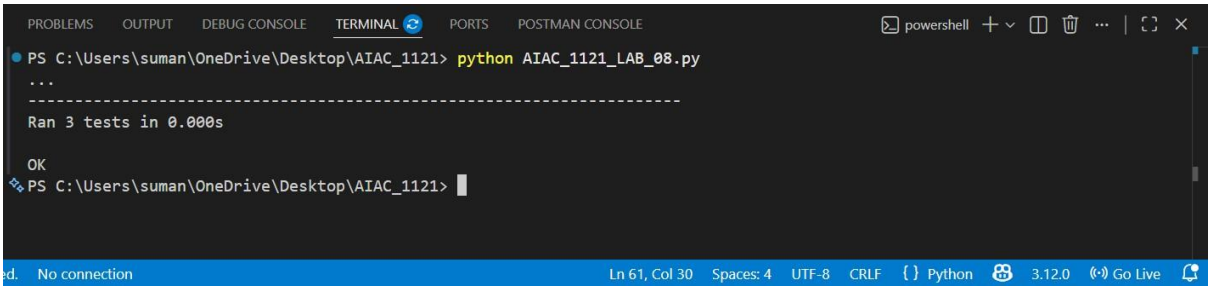
Explanation :

The function first validates that the input is an integer. It then checks divisibility by 2 using modulus operator. It handles zero, negative, and large integers correctly.

Task – 02 : Test – Driven Development for String Case Converter.
Prompt : Generate test cases for to_uppercase(text) and to_lowercase(text) handling empty strings, mixed-case input, and invalid inputs. **Code :**



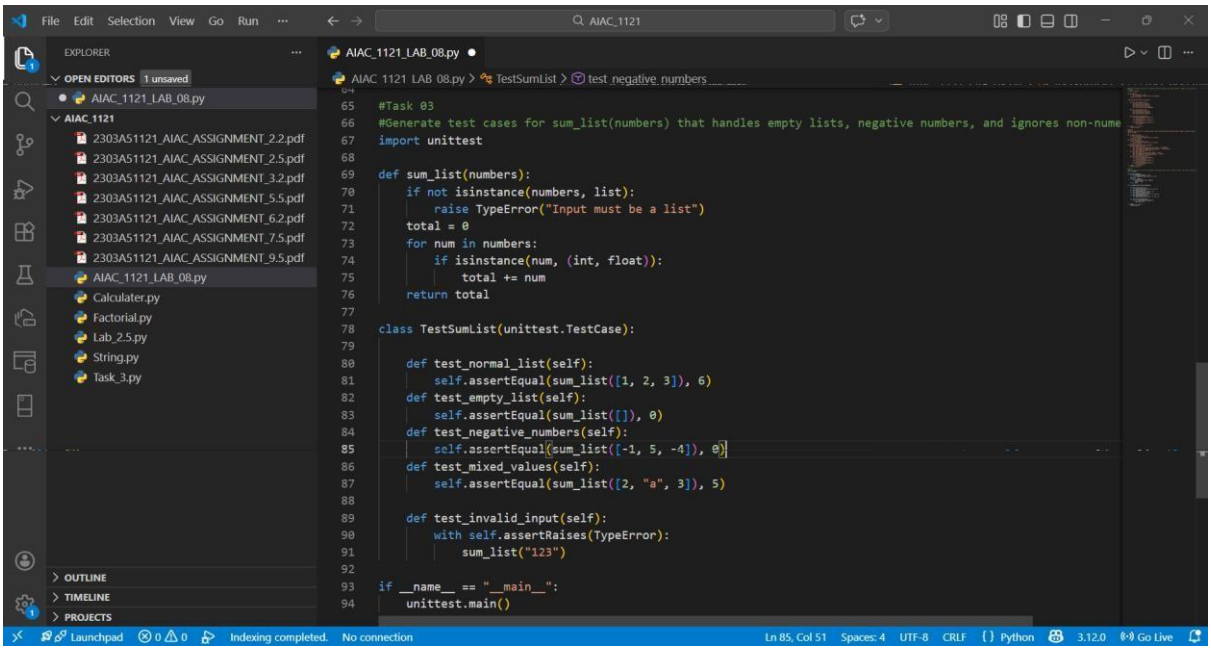
Output:



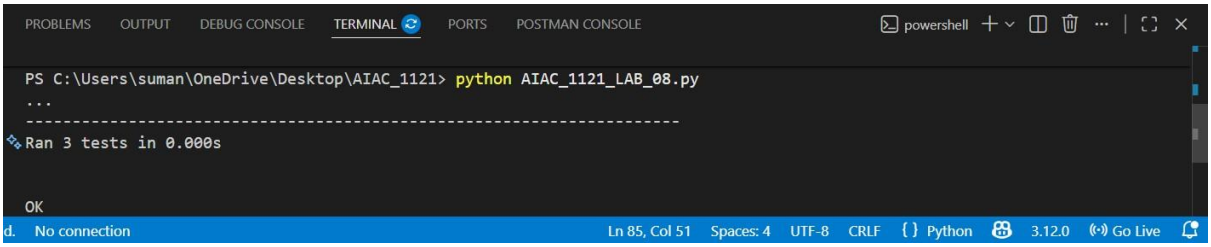
Explanation :
Both functions validate input type and use built-in string methods .upper() and .lower() for conversion.
Task – 03 : Test – Driven Development for List sum Calculator.
Prompt : Generate test cases for sum_list(numbers) that handles

empty lists, negative numbers, and ignores non-numeric values.

Code :



Output :



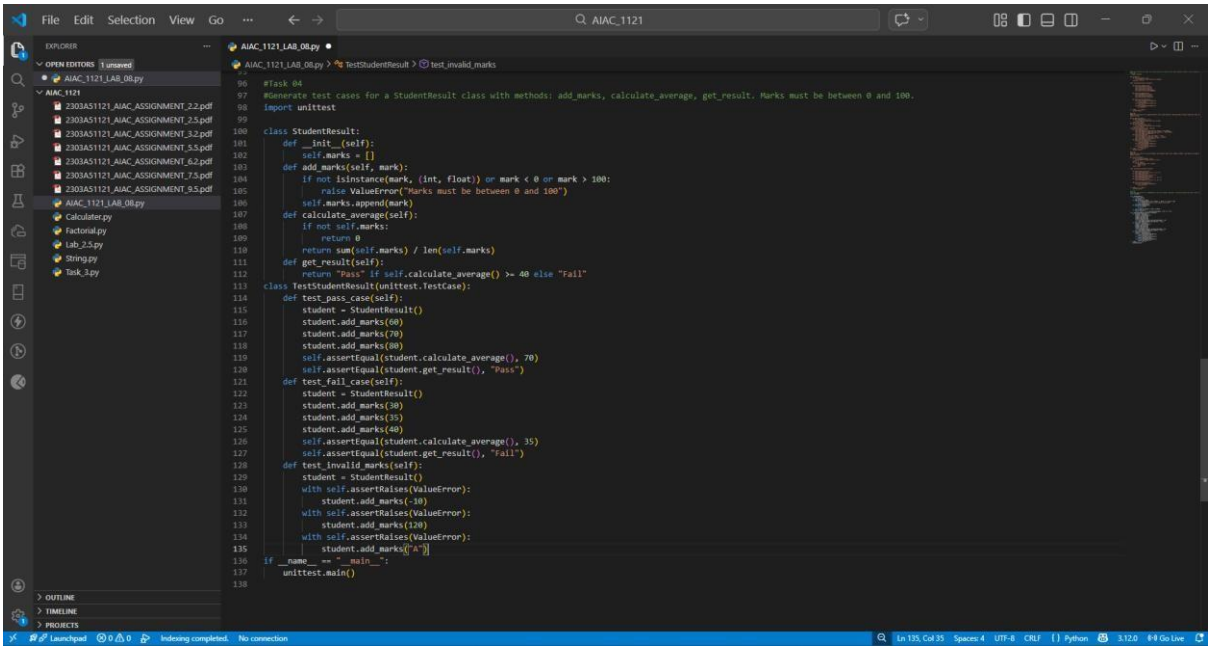
Explanation :

The function iterates through the list and adds only numeric values. It safely ignores non-numeric elements and returns 0 for empty lists.

Task – 04 : Test Cases for Student Result Class.

Prompt : Generate test cases for a StudentResult class with methods: add_marks, calculate_average, get_result. Marks must be between 0 and 100.

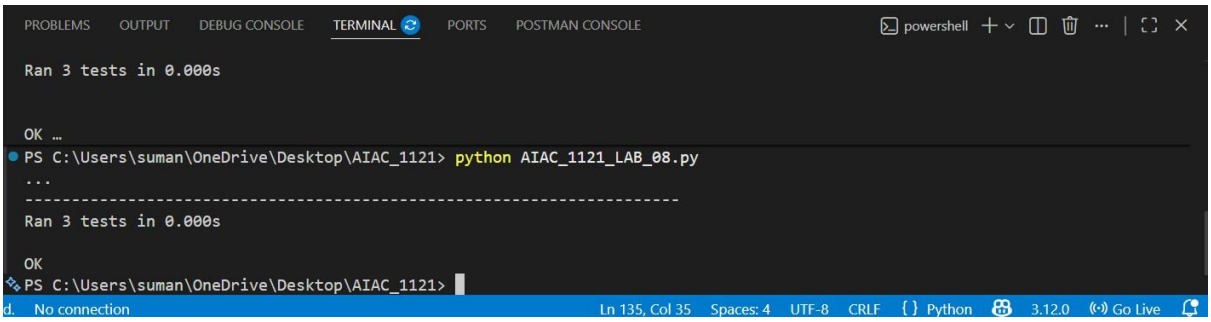
Code :



```python
#Task 04
#Generate test cases for a StudentResult class with methods: add_marks, calculate_average, get_result. Marks must be between 0 and 100.
import unittest

class StudentResult:
    def __init__(self):
        self.marks = []
    def add_marks(self, mark):
        if not isinstance(mark, (int, float)) or mark < 0 or mark > 100:
            raise ValueError("Marks must be between 0 and 100")
        self.marks.append(mark)
    def calculate_average(self):
        if not self.marks:
            return 0
        return sum(self.marks) / len(self.marks)
    def get_result(self):
        return "Pass" if self.calculate_average() >= 40 else "Fail"
class TestStudentResult(unittest.TestCase):
    def test_pass_case(self):
        student = StudentResult()
        student.add_marks(60)
        student.add_marks(70)
        student.add_marks(80)
        self.assertEqual(student.calculate_average(), 70)
        self.assertEqual(student.get_result(), "Pass")
    def test_fail_case(self):
        student = StudentResult()
        student.add_marks(30)
        student.add_marks(35)
        student.add_marks(40)
        self.assertEqual(student.calculate_average(), 35)
        self.assertEqual(student.get_result(), "Fail")
    def test_invalid_marks(self):
        student = StudentResult()
        with self.assertRaises(ValueError):
            student.add_marks(-10)
        with self.assertRaises(ValueError):
            student.add_marks(120)
        with self.assertRaises(ValueError):
            student.add_marks("A")
if __name__ == "__main__":
    unittest.main()
```

Output:



```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS  POSTMAN CONSOLE        powershell

Ran 3 tests in 0.000s


OK …
PS C:\Users\suman\OneDrive\Desktop\AIAC_1121> python AIAC_1121_LAB_08.py
...
----------------------------------------------------------------------
Ran 3 tests in 0.000s

OK
PS C:\Users\suman\OneDrive\Desktop\AIAC_1121>
d.  No connection   Ln 135, Col 35  Spaces: 4  UTF-8  CRLF  { } Python  3.12.0  Go Live
```

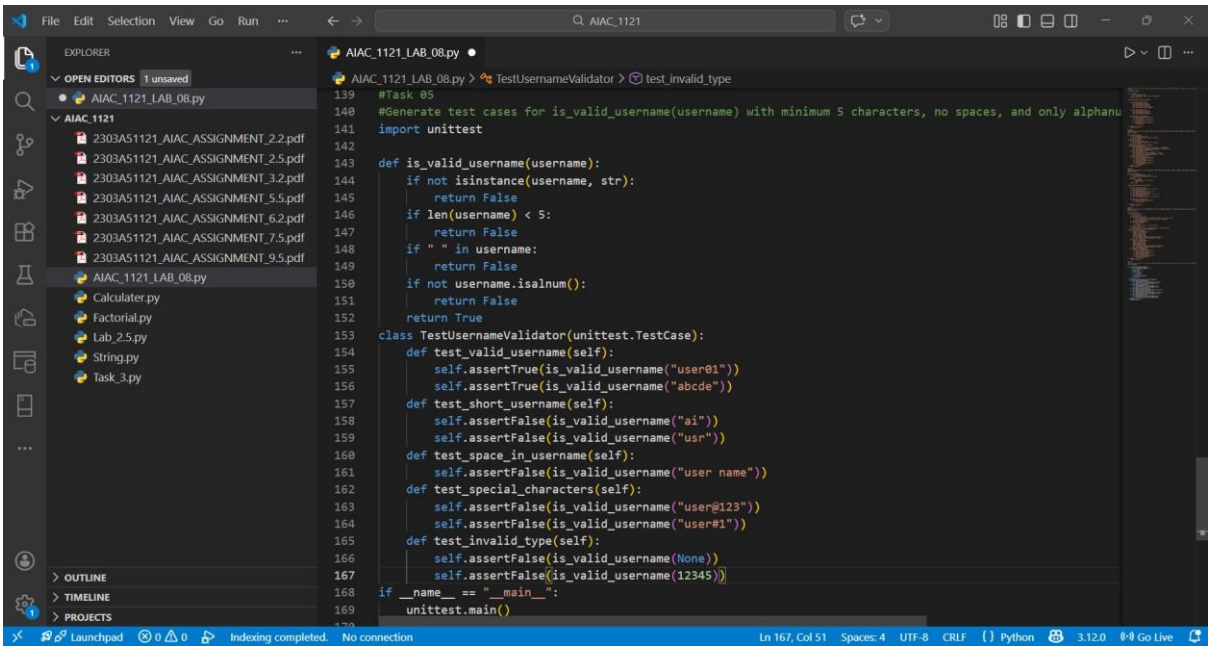
Explanation :

The class validates marks before storing them. It calculates average dynamically and determines result based on 40% threshold.

Task – 05 : Test – Driven Development for username Validator.

Prompt : Generate test cases for is_valid_username(username) with minimum 5 characters, no spaces, and only alphanumeric characters.

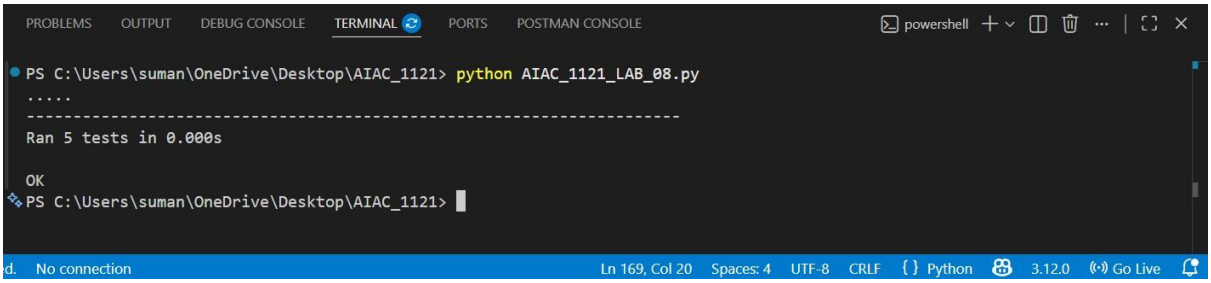
Code :



```python
#Task 05
#Generate test cases for is_valid_username(username) with minimum 5 characters, no spaces, and only alphanu
import unittest

def is_valid_username(username):
    if not isinstance(username, str):
        return False
    if len(username) < 5:
        return False
    if " " in username:
        return False
    if not username.isalnum():
        return False
    return True
class TestUsernameValidator(unittest.TestCase):
    def test_valid_username(self):
        self.assertTrue(is_valid_username("user01"))
        self.assertTrue(is_valid_username("abcde"))
    def test_short_username(self):
        self.assertFalse(is_valid_username("ai"))
        self.assertFalse(is_valid_username("usr"))
    def test_space_in_username(self):
        self.assertFalse(is_valid_username("user name"))
    def test_special_characters(self):
        self.assertFalse(is_valid_username("user@123"))
        self.assertFalse(is_valid_username("user#1"))
    def test_invalid_type(self):
        self.assertFalse(is_valid_username(None))
        self.assertFalse(is_valid_username(12345))
if __name__ == "__main__":
    unittest.main()
```

Output :



```
PS C:\Users\suman\OneDrive\Desktop\AIAC_1121> python AIAC_1121_LAB_08.py
.....
----------------------------------------------------------------------
Ran 5 tests in 0.000s

OK
PS C:\Users\suman\OneDrive\Desktop\AIAC_1121>
```

Explanation :

The function checks length, space restriction, and alphanumeric condition using built-in string validation methods.

THANK YOU!!