AI - Assisted Coding-Assignment -2

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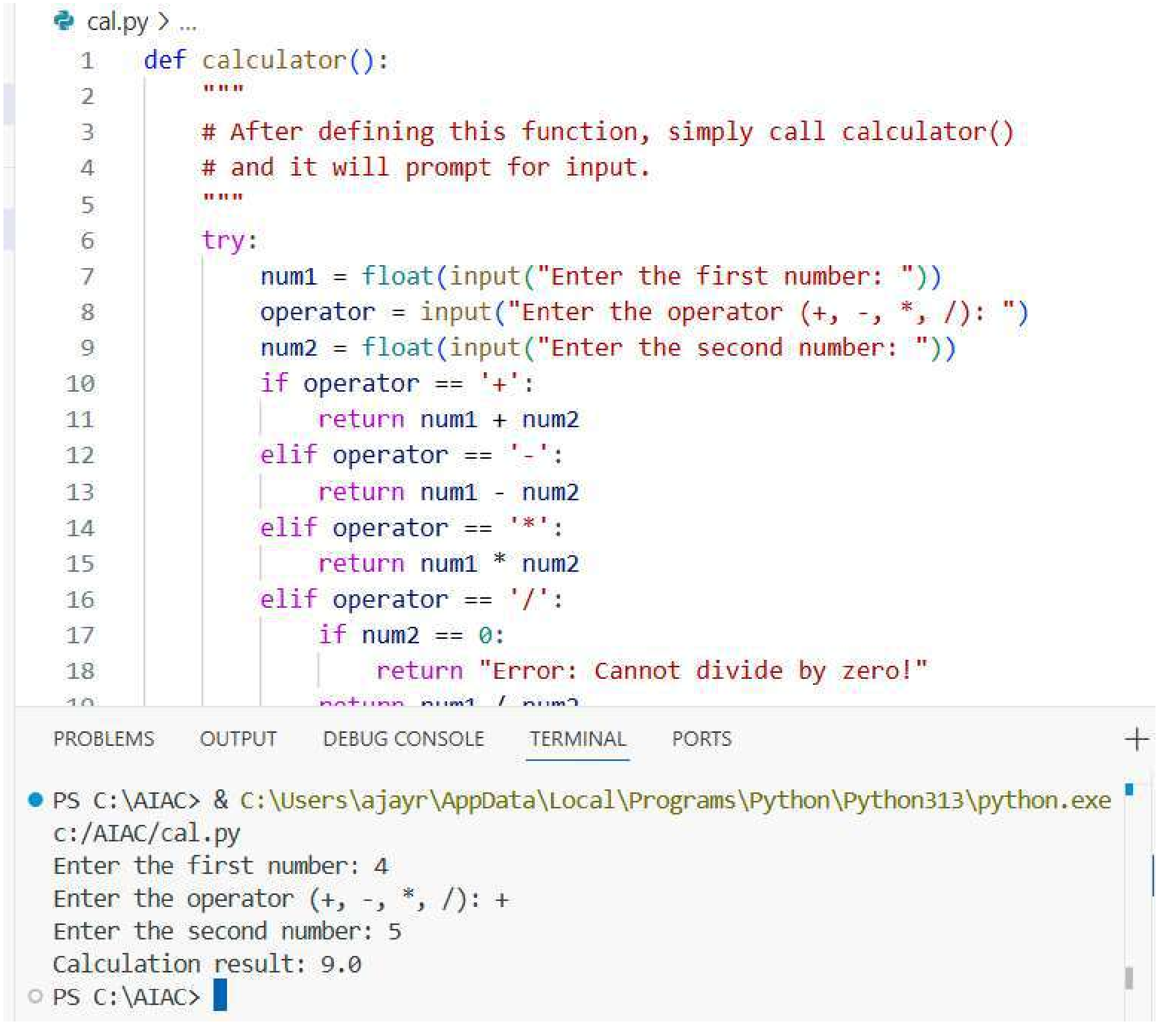
Lab 2: Exploring Additional AI Coding Tools beyond Copilot – Gemini (Colab) and Cursor AI

Task Description-1
Cleaning Sensor Data
Expected Output:
Before/after list Screenshot of Colab execution
Prompt:
Design a simple calculator function. That Take two numbers and an operator and Support +, -, *, /,Handle division by zero,Return meaningful error messages.
CODE AND OUTPUT:



cal.py > ...

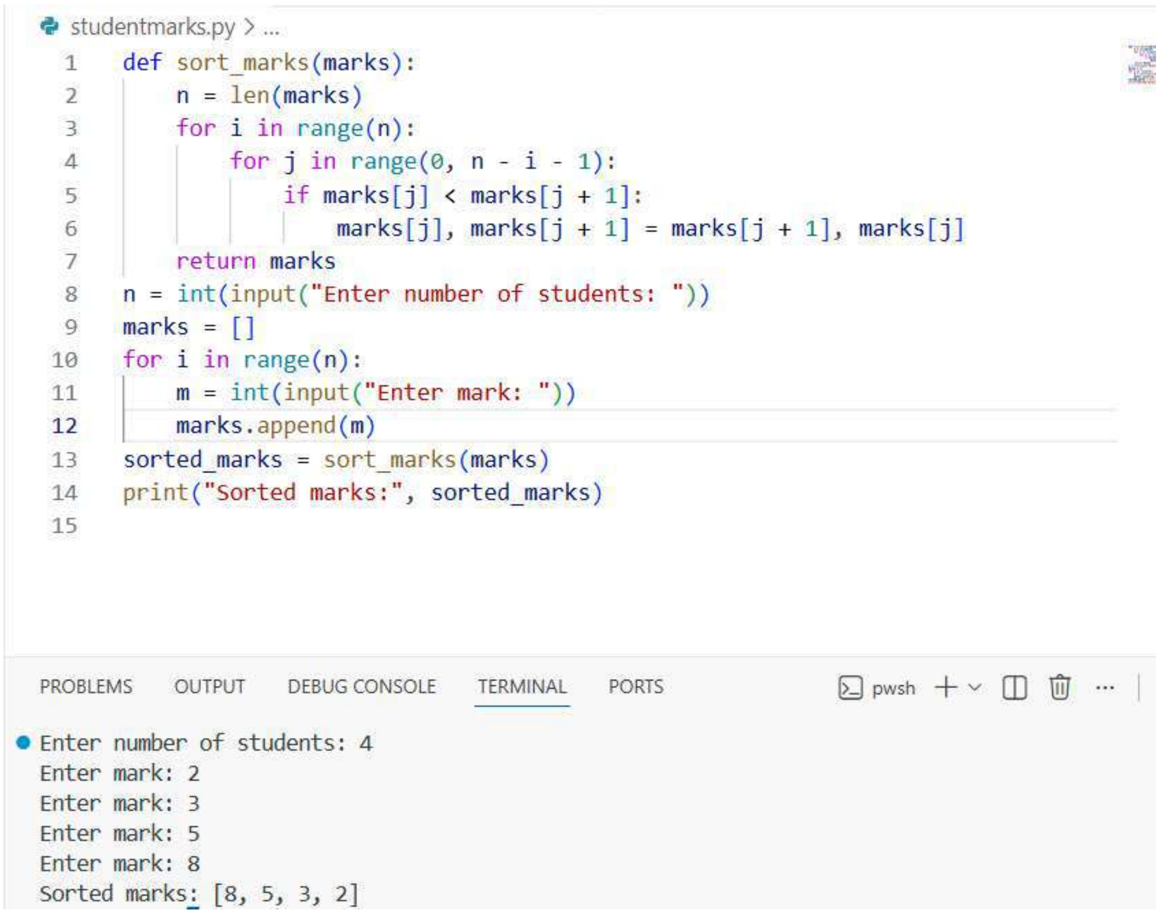
```python
def calculator():
    """
    # After defining this function, simply call calculator()
    # and it will prompt for input.
    """
    try:
        num1 = float(input("Enter the first number: "))
        operator = input("Enter the operator (+, -, *, /): ")
        num2 = float(input("Enter the second number: "))
        if operator == '+':
            return num1 + num2
        elif operator == '-':
            return num1 - num2
        elif operator == '*':
            return num1 * num2
        elif operator == '/':
            if num2 == 0:
                return "Error: Cannot divide by zero!"
```

```
PS C:\AIAC> & C:\Users\ajayr\AppData\Local\Programs\Python\Python313\python.exe c:/AIAC/cal.py
Enter the first number: 4
Enter the operator (+, -, *, /): +
Enter the second number: 5
Calculation result: 9.0
PS C:\AIAC>
```

Explanation:

The program takes two numbers and an operator as input from the user at runtime.
The calculator function performs the selected arithmetic operation.
It checks for division by zero and invalid operators to avoid errors.
The final result is displayed to the user.

Task Description-2
String Character Analysis
Expected Output:
Working function and Sample inputs and outputs
Prompt:
Design a function to sort student marks in descending order using Bubble Sort.
CODE AND OUTPUT:

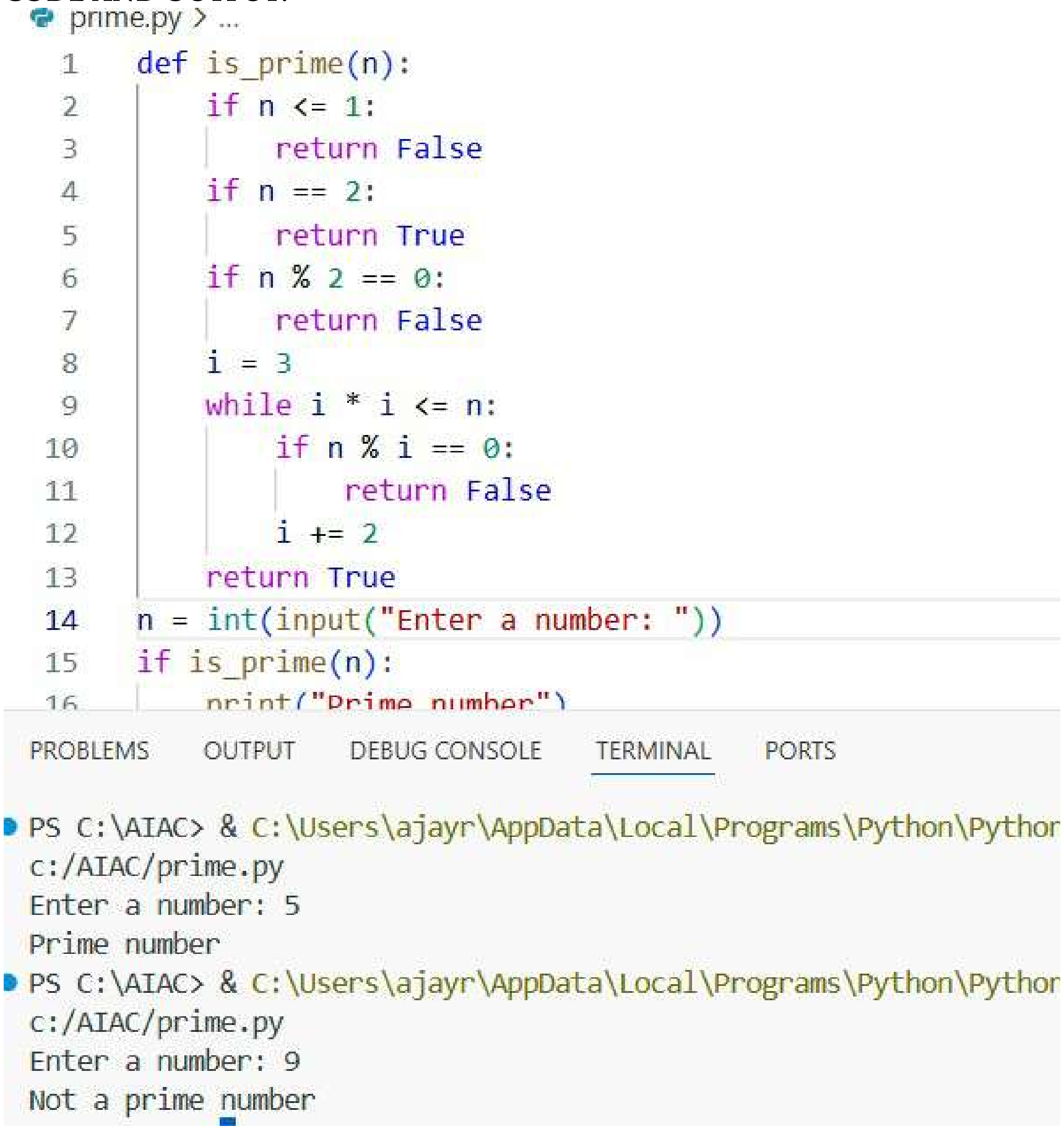


```python
def sort_marks(marks):
    n = len(marks)
    for i in range(n):
        for j in range(0, n - i - 1):
            if marks[j] < marks[j + 1]:
                marks[j], marks[j + 1] = marks[j + 1], marks[j]
    return marks
n = int(input("Enter number of students: "))
marks = []
for i in range(n):
    m = int(input("Enter mark: "))
    marks.append(m)
sorted_marks = sort_marks(marks)
print("Sorted marks:", sorted_marks)
```

```
Enter number of students: 4
Enter mark: 2
Enter mark: 3
Enter mark: 5
Enter mark: 8
Sorted marks: [8, 5, 3, 2]
```

Explanation: This Code First takes a len of the marks and then takes the list of marks of students .Then according to the users dependency it will sort the marks.

Task Description-3
Palindrome Check – Tool Comparison
Expected Output:
Improved prime-checking function with better edge-case handling.

Prompt:
Design a Python program to check whether a number is prime by taking the input dynamically from the user. The program should correctly handle edge cases such as 0 and 1 .identify prime numbers like 2 and 17, and non-prime numbers like 4 and 18. It should use an efficient approach by checking divisibility only up to the square root of the number and then display whether the entered number is prime or not.
CODE AND OUTPUT:

prime.py > ...

```python
def is_prime(n):
    if n <= 1:
        return False
    if n == 2:
        return True
    if n % 2 == 0:
        return False
    i = 3
    while i * i <= n:
        if n % i == 0:
            return False
        i += 2
    return True
n = int(input("Enter a number: "))
if is_prime(n):
    print("Prime number")
```

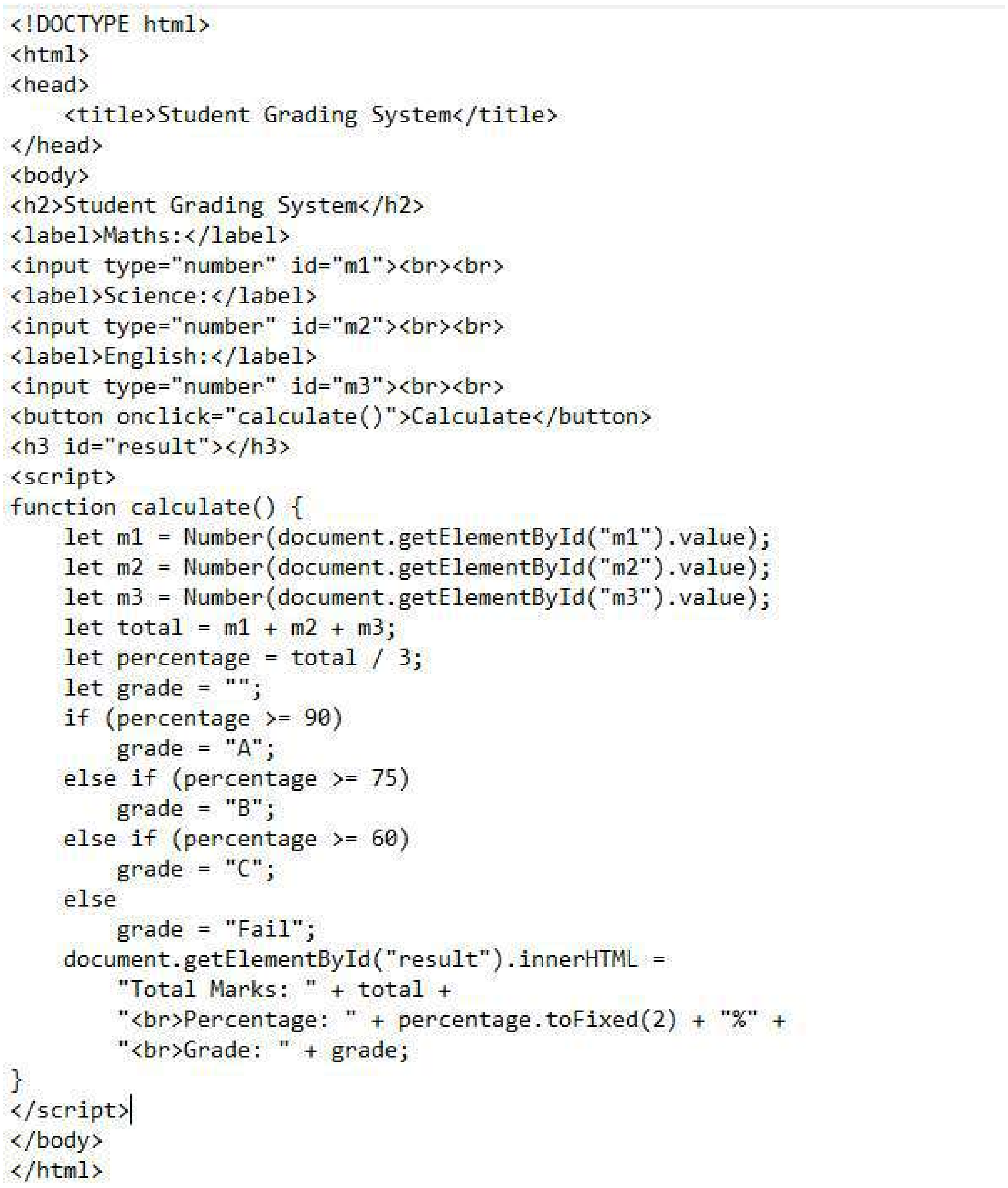
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

```
PS C:\AIAC> & C:\Users\ajayr\AppData\Local\Programs\Python\Pythor
c:/AIAC/prime.py
Enter a number: 5
Prime number
PS C:\AIAC> & C:\Users\ajayr\AppData\Local\Programs\Python\Pythor
c:/AIAC/prime.py
Enter a number: 9
Not a prime number
```

Explanation:
The code first takes a number as input from the user. It then checks special cases such as numbers less than or equal to 1, which are not prime. For efficiency, it eliminates even numbers greater than 2 and checks divisibility only up to the square root of the number.

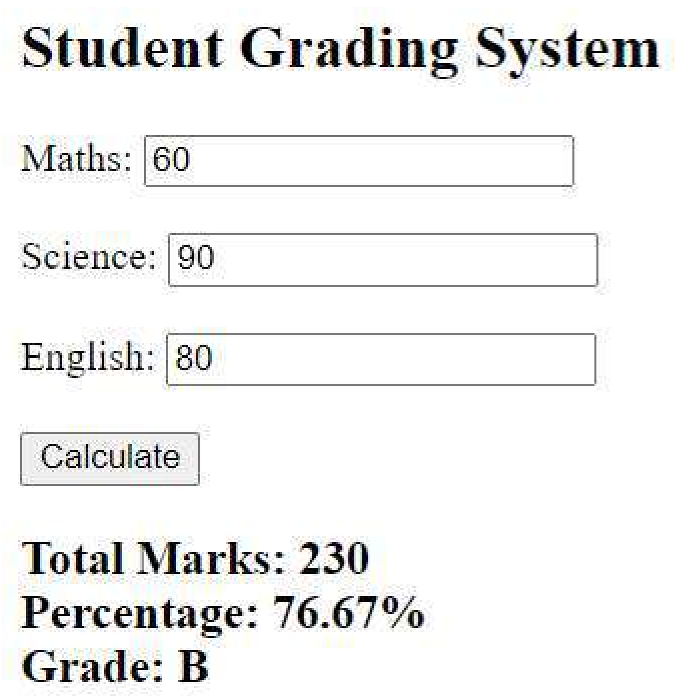
Finally, it prints whether the given number is a prime number or not.

Task Description-4
Prompt-Guided UI Design for Student Grading System: Create a user interface for a student grading system that calculates total marks, percentage, and grade based on user input.
Expected Output:
Well-structured UI code with accurate calculations and clear output display.
Prompt:
Create a simple user interface for a student grading system.
The UI should take student marks as input, calculate total marks, percentage, and grade,and clearly display the results. Use accurate calculations and a clean layout.
CODE :



```
<!DOCTYPE html>
<html>
<head>
    <title>Student Grading System</title>
</head>
<body>
<h2>Student Grading System</h2>
<label>Maths:</label>
<input type="number" id="m1"><br><br>
<label>Science:</label>
<input type="number" id="m2"><br><br>
<label>English:</label>
<input type="number" id="m3"><br><br>
<button onclick="calculate()">Calculate</button>
<h3 id="result"></h3>
<script>
function calculate() {
    let m1 = Number(document.getElementById("m1").value);
    let m2 = Number(document.getElementById("m2").value);
    let m3 = Number(document.getElementById("m3").value);
    let total = m1 + m2 + m3;
    let percentage = total / 3;
    let grade = "";
    if (percentage >= 90)
        grade = "A";
    else if (percentage >= 75)
        grade = "B";
    else if (percentage >= 60)
        grade = "C";
    else
        grade = "Fail";
    document.getElementById("result").innerHTML =
        "Total Marks: " + total +
        "<br>Percentage: " + percentage.toFixed(2) + "%" +
        "<br>Grade: " + grade;
}
</script>
</body>
</html>
```

OUTPUT:


Student Grading System

Maths: 60

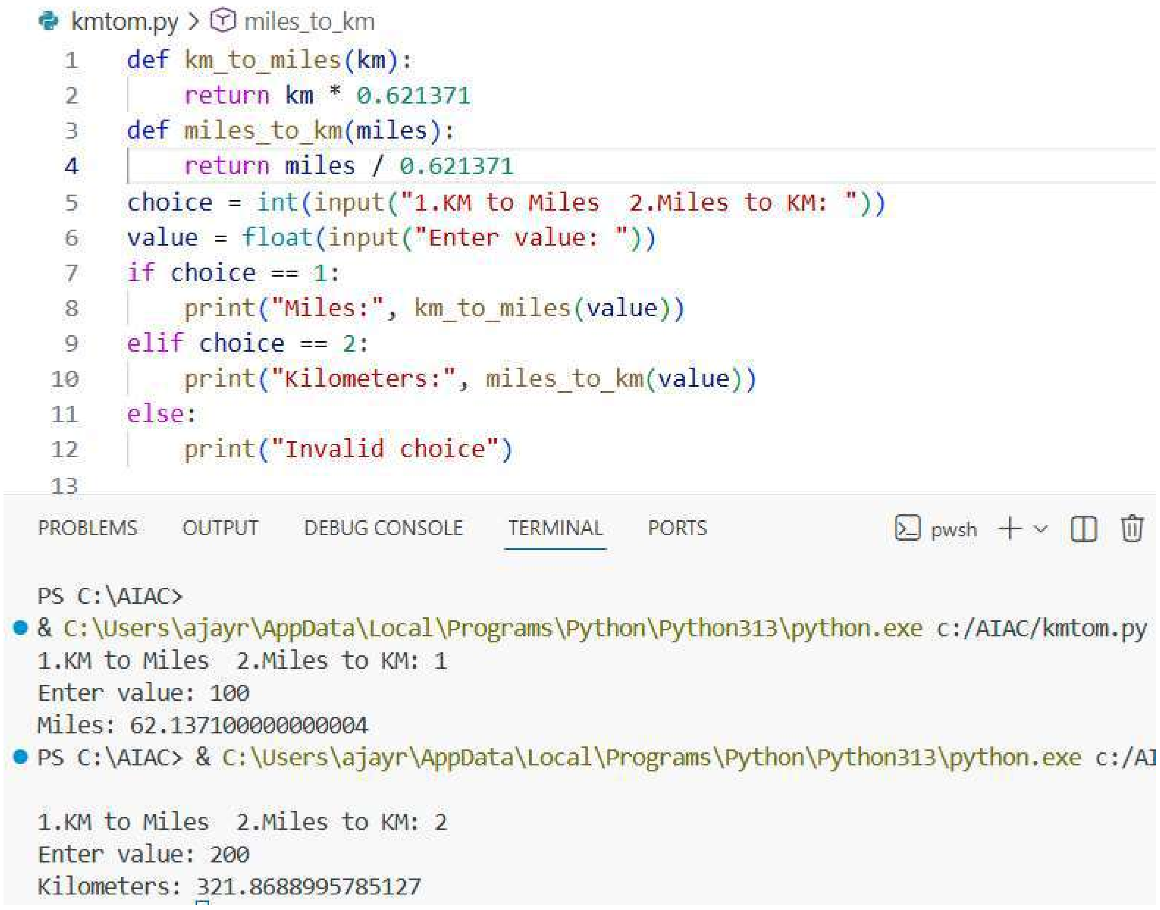
Science: 90

English: 80

Total Marks: 230
Percentage: 76.67%
Grade: B

Explanation:
The user interface takes marks for different subjects through input fields. When the Calculate button is clicked, JavaScript reads the entered values and computes the total marks and percentage. Based on the percentage, the program assigns a grade using conditional statements. Finally, the calculated total, percentage, and grade are displayed clearly on the screen.

Task Description-5
Analyzing Prompt Specificity in Unit Conversion Functions: Improving a Unit Conversion Function (Kilometers to Miles and Miles to Kilometers) Using Clear Instructions**.**
Expected Output:
Analysis of code quality and accuracy differences across multiple prompt variations.
Prompt:
Design a Python program that takes user input and converts:
kilometers to miles,miles to kilometers. Display accurate results with clear output
CODE AND OUTPUT:



kmtom.py > miles_to_km

```python
def km_to_miles(km):
    return km * 0.621371
def miles_to_km(miles):
    return miles / 0.621371
choice = int(input("1.KM to Miles  2.Miles to KM: "))
value = float(input("Enter value: "))
if choice == 1:
    print("Miles:", km_to_miles(value))
elif choice == 2:
    print("Kilometers:", miles_to_km(value))
else:
    print("Invalid choice")
```

```
PS C:\AIAC>
& C:\Users\ajayr\AppData\Local\Programs\Python\Python313\python.exe c:/AIAC/kmtom.py
1.KM to Miles  2.Miles to KM: 1
Enter value: 100
Miles: 62.137100000000004
PS C:\AIAC> & C:\Users\ajayr\AppData\Local\Programs\Python\Python313\python.exe c:/AI

1.KM to Miles  2.Miles to KM: 2
Enter value: 200
Kilometers: 321.8688995785127
```

Explanation:
The clearer the prompt, the better the code. A vague prompt can give incomplete or wrong functions, but a well-explained prompt helps create accurate, easy-to-use conversion functions that handle user input and show results clearly.