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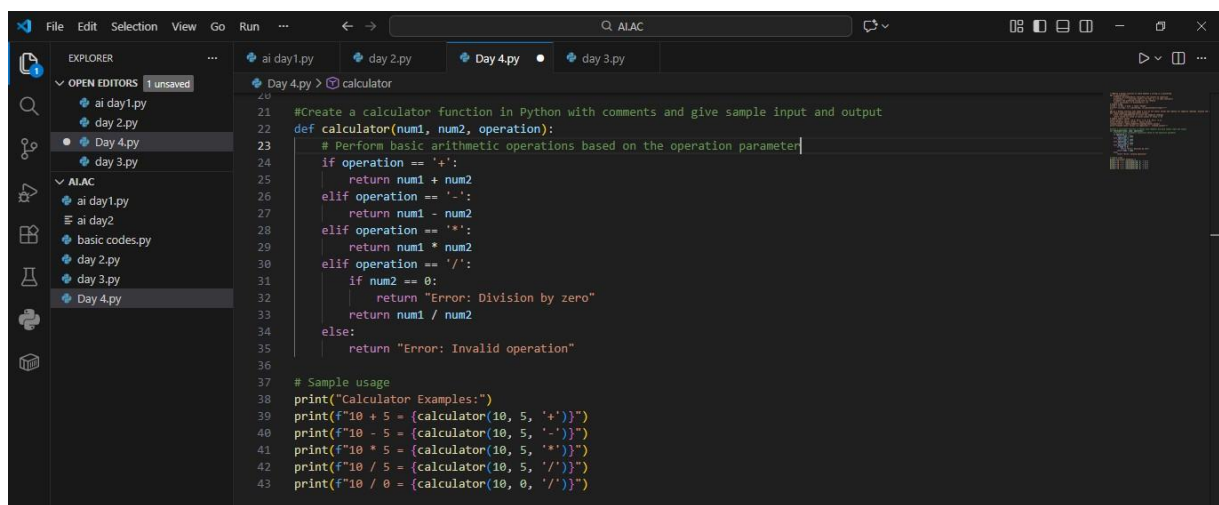
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## ASSIGNMENT -3.2

### Task 1: Progressive Prompting – Calculator Design

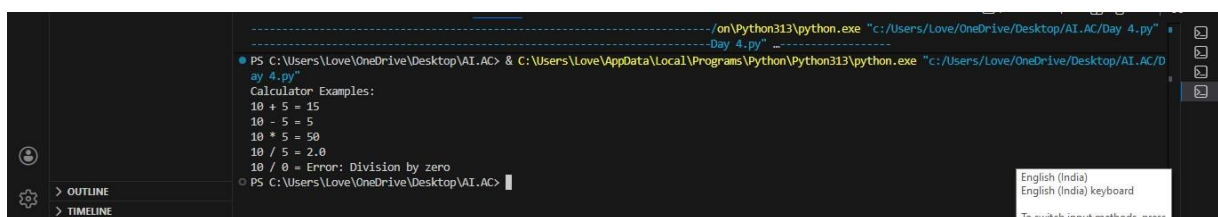
**PROMPT:** Create a calculator function in Python with comments and give sample input and output.



The screenshot shows the Visual Studio Code editor with a file explorer on the left and a code editor on the right. The file explorer shows a project named 'AIAC' with several Python files. The code editor displays a Python file named 'Day 4.py' containing a calculator function. The function is named 'calculator' and takes three arguments: 'num1', 'num2', and 'operation'. It performs basic arithmetic operations based on the 'operation' parameter: addition (+), subtraction (-), multiplication (\*), and division (/). It also includes error handling for division by zero and invalid operations. Sample usage is provided at the bottom of the file.

```
21 #Create a calculator function in Python with comments and give sample input and output
22 def calculator(num1, num2, operation):
23     # Perform basic arithmetic operations based on the operation parameter
24     if operation == '+':
25         return num1 + num2
26     elif operation == '-':
27         return num1 - num2
28     elif operation == '*':
29         return num1 * num2
30     elif operation == '/':
31         if num2 == 0:
32             return "Error: Division by zero"
33         return num1 / num2
34     else:
35         return "Error: Invalid operation"
36
37 # Sample usage
38 print("Calculator Examples:")
39 print(f"10 + 5 = {calculator(10, 5, '+')}")
40 print(f"10 - 5 = {calculator(10, 5, '-')}")
41 print(f"10 * 5 = {calculator(10, 5, '*')}")
42 print(f"10 / 5 = {calculator(10, 5, '/')}")
43 print(f"10 / 0 = {calculator(10, 0, '/')}")
```

### OUTPUT:



The screenshot shows a terminal window with the output of the calculator function. The output displays the results of the sample usage code, including the calculator examples and the error message for division by zero.

```
PS C:\Users\Love\OneDrive\Desktop\AI.AC> & C:\Users\Love\AppData\Local\Programs\Python\Python313\python.exe "C:/Users/Love/OneDrive/Desktop/AI.AC/Day 4.py"
Calculator Examples:
10 + 5 = 15
10 - 5 = 5
10 * 5 = 50
10 / 5 = 2.0
10 / 0 = Error: Division by zero
```

### EXPLANATION:

When we give only a function name, the AI generates very basic or incomplete code.

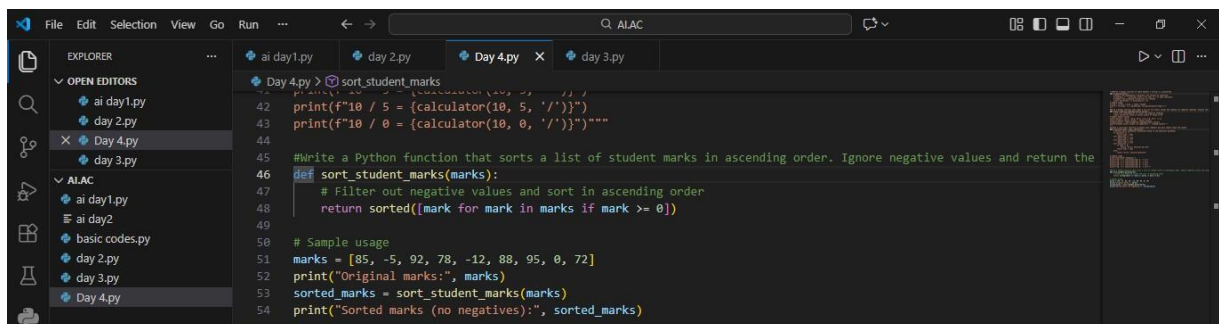
As we gradually add comments, requirements, and examples, the AI understands better and produces:

- Proper logic ,Error handling , Cleaner structure

This shows that well-defined prompts lead to better AI-generated programs.

## Task 2: Refining Prompts – Sorting Student Marks

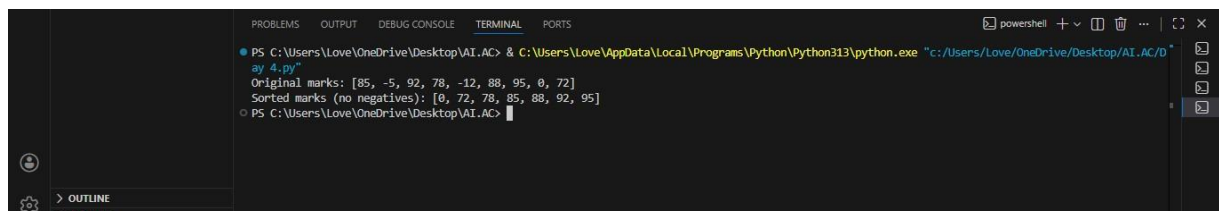
**PROMPT:** Write a Python function that sorts a list of student marks in ascending order. Ignore negative values and return the sorted list using efficient logic.



The screenshot shows a code editor with a file explorer on the left and a code editor on the right. The file explorer shows a project named 'ALAC' with files 'ai day1.py', 'day 2.py', 'Day 4.py', and 'day 3.py'. The code editor shows the following Python code:

```
42 print(f"10 / 5 = {calculator(10, 5, '/')}")
43 print(f"10 / 0 = {calculator(10, 0, '/')}")"""
44
45 #Write a Python function that sorts a list of student marks in ascending order. Ignore negative values and return the
46 def sort_student_marks(marks):
47     # Filter out negative values and sort in ascending order
48     return sorted([mark for mark in marks if mark >= 0])
49
50 # Sample usage
51 marks = [85, -5, 92, 78, -12, 88, 95, 0, 72]
52 print("Original marks:", marks)
53 sorted_marks = sort_student_marks(marks)
54 print("Sorted marks (no negatives):", sorted_marks)
```

**OUTPUT:**



The screenshot shows a terminal window with the following output:

```
PS C:\Users\Love\OneDrive\Desktop\AI.AC> & C:\Users\Love\AppData\Local\Programs\Python\Python313\python.exe "c:/Users/Love/OneDrive/Desktop/AI.AC/day 4.py"
Original marks: [85, -5, 92, 78, -12, 88, 95, 0, 72]
Sorted marks (no negatives): [0, 72, 78, 85, 88, 92, 95]
PS C:\Users\Love\OneDrive\Desktop\AI.AC>
```

## EXPLANATION:

This task demonstrates how **vague prompts cause ambiguous results**. Initially, the AI may not know:

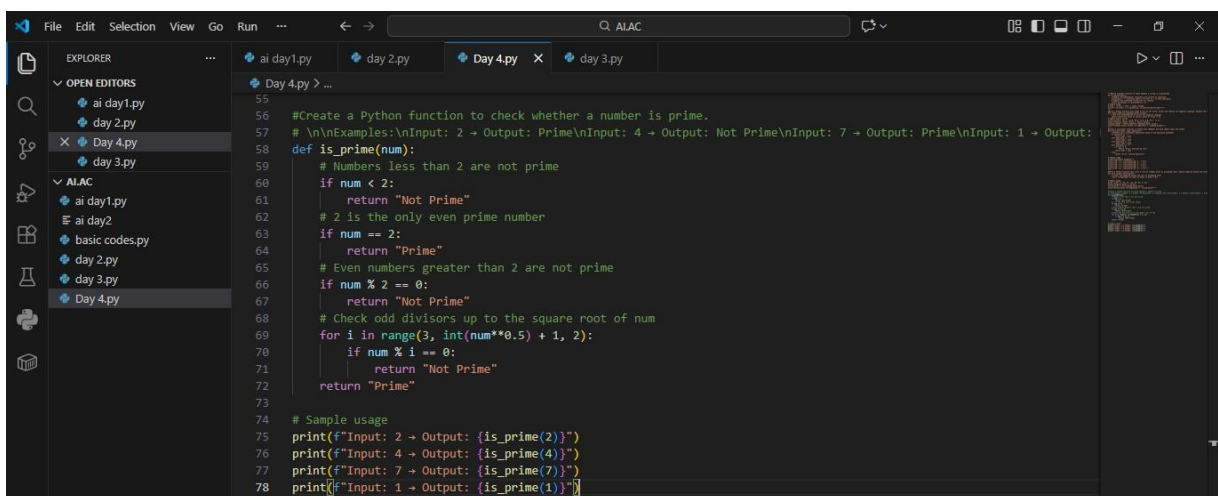
- Sorting order , Data constraints , Output format

By refining the prompt, we guide the AI to generate **accurate and efficient sorting logic**.

This highlights the importance of **specific instructions in prompt engineering**.

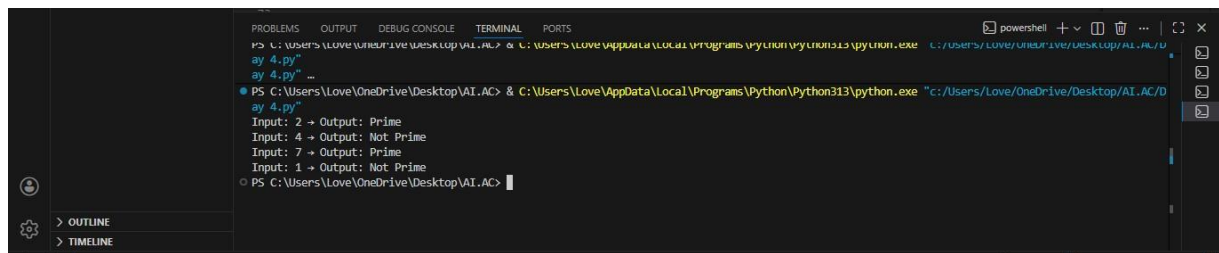
## Task 3: Few-Shot Prompting – Prime Number Validation

**Prompt:** Create a Python function to check whether a number is prime. Examples:\n Input: 2 → Output: Prime\n Input: 4 → Output: Not Prime\n Input: 7 → Output: Prime\n Input: 1 → Output: Not Prime\n Use these examples to design the logic

A screenshot of a code editor interface, likely Visual Studio Code, showing a Python file named 'Day 4.py'. The editor has a dark theme. On the left, the 'EXPLORER' sidebar shows a file tree with 'ai day 1.py', 'day 2.py', 'Day 4.py' (selected), and 'day 3.py'. The main editor area displays the following Python code:

```
55
56 #Create a Python function to check whether a number is prime.
57 # \n\nExamples:\nInput: 2 → Output: Prime\nInput: 4 → Output: Not Prime\nInput: 7 → Output: Prime\nInput: 1 → Output:
58 def is_prime(num):
59     # Numbers less than 2 are not prime
60     if num < 2:
61         return "Not Prime"
62     # 2 is the only even prime number
63     if num == 2:
64         return "Prime"
65     # Even numbers greater than 2 are not prime
66     if num % 2 == 0:
67         return "Not Prime"
68     # Check odd divisors up to the square root of num
69     for i in range(3, int(num**0.5) + 1, 2):
70         if num % i == 0:
71             return "Not Prime"
72     return "Prime"
73
74 # Sample usage
75 print(f"Input: 2 → Output: {is_prime(2)}")
76 print(f"Input: 4 → Output: {is_prime(4)}")
77 print(f"Input: 7 → Output: {is_prime(7)}")
78 print(f"Input: 1 → Output: {is_prime(1)}")
```

## OUTPUT:



```
PS C:\Users\Love\OneDrive\Desktop\AI.AC> & C:\Users\Love\AppData\Local\Programs\Python\Python313\python.exe "C:/Users/Love/OneDrive/Desktop/AI.AC/D
ay 4.py" -
PS C:\Users\Love\OneDrive\Desktop\AI.AC> & C:\Users\Love\AppData\Local\Programs\Python\Python313\python.exe "C:/Users/Love/OneDrive/Desktop/AI.AC/D
ay 4.py" -
Input: 2 -> Output: Prime
Input: 4 -> Output: Not Prime
Input: 7 -> Output: Prime
Input: 1 -> Output: Not Prime
PS C:\Users\Love\OneDrive\Desktop\AI.AC>
```

## EXPLANATION:

Few-shot prompting means providing **example inputs and outputs** along with the prompt. This helps the AI:

- Understand edge cases , Improve accuracy , Avoid logical mistakes

Compared to a simple prompt, few-shot prompting results in **more reliable prime-checking logic**.

## Task 4: Prompt-Guided UI Design – Student Grading System

**Prompt :** Create a Python program with a simple user interface that accepts student marks, calculates total marks, percentage, and grade, and displays the result.

```
80 #Create a Python program with a simple user interface that accepts student marks, calculates total marks, percentage, and g
81 def calculate_grade(marks):
82     # Calculate total marks
83     total_marks = sum(marks)
84     # Calculate percentage
85     percentage = (total_marks / (len(marks) * 100)) * 100
86     # Determine grade based on percentage
87     if percentage >= 90:
88         grade = 'A'
89     elif percentage >= 80:
90         grade = 'B'
91     elif percentage >= 70:
92         grade = 'C'
93     elif percentage >= 60:
94         grade = 'D'
95     else:
96         grade = 'F'
97     return total_marks, percentage, grade
98 # User interface to accept student marks
99 def main():
100     print("Student Marks Calculator")
101     marks = []
102     num_subjects = int(input("Enter the number of subjects: "))
103     for i in range(num_subjects):
104         mark = float(input(f"Enter marks for subject {i + 1} (out of 100): "))
105         marks.append(mark)
106     total, percentage, grade = calculate_grade(marks)
107     print(f"\nTotal Marks: {total}")
108     print(f"Percentage: {percentage:.2f}%")
109     print(f"Grade: {grade}")
110 if __name__ == "__main__":
111     main()
```

## Output:

```
Student Marks Calculator
Enter the number of subjects: 5
Enter marks for subject 1 (out of 100): 50
Enter marks for subject 2 (out of 100): 60
Enter marks for subject 3 (out of 100): 70
Enter marks for subject 4 (out of 100): 90
Enter marks for subject 5 (out of 100): 80

Total Marks: 350.0
Percentage: 70.00%
Grade: C
```

## Explanation:

This task focuses on using prompts to guide program structure and user interaction.

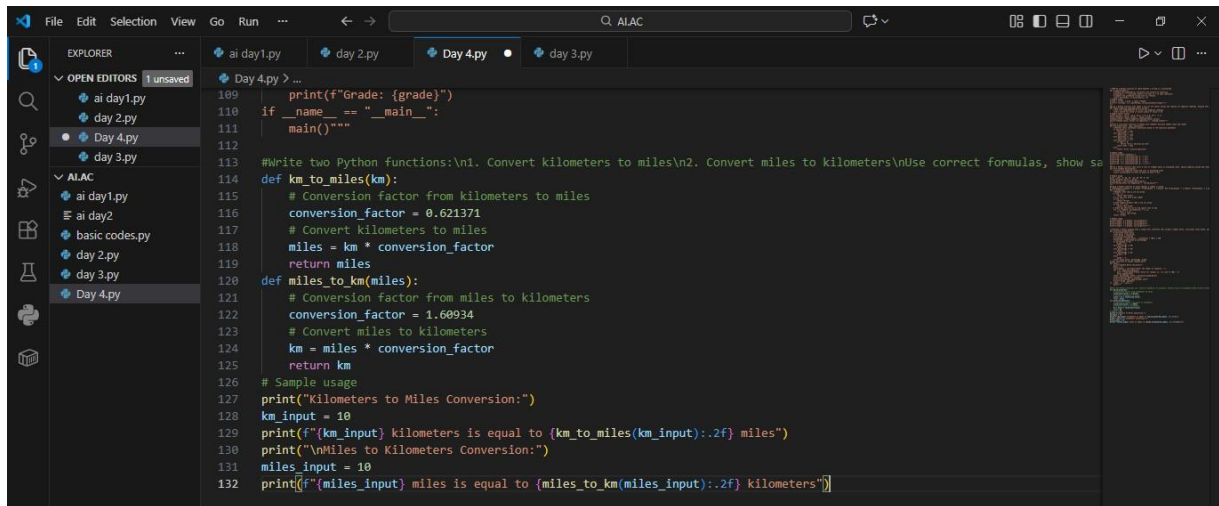
Instead of a graphical UI, a console-based UI is used for:

- Simplicity , Code compatibility , Clear user interaction

## Task 5: Prompt Specificity – Unit Conversion Function

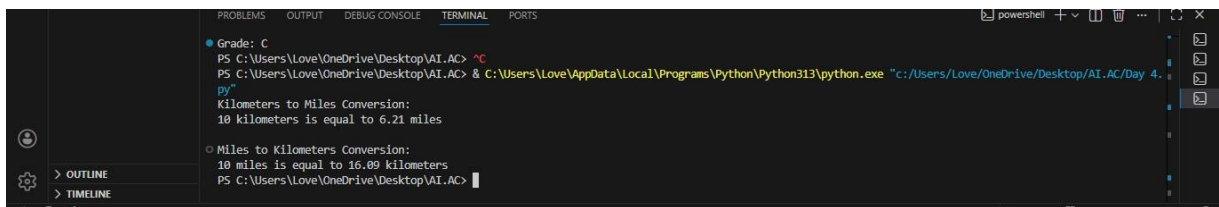
### Prompt:

Write two Python functions:\n1. Convert kilometers to miles\n2. Convert miles to kilometers\nUse correct formulas, show sample input/output, and add comments explaining the logic



```
109 | print(f"Grade: {grade}")
110 | if __name__ == "__main__":
111 |     main()
112 |
113 | #Write two Python functions:\n1. Convert kilometers to miles\n2. Convert miles to kilometers\nUse correct formulas, show sa
114 | def km_to_miles(km):
115 |     # Conversion factor from kilometers to miles
116 |     conversion_factor = 0.621371
117 |     # Convert kilometers to miles
118 |     miles = km * conversion_factor
119 |     return miles
120 | def miles_to_km(miles):
121 |     # Conversion factor from miles to kilometers
122 |     conversion_factor = 1.60934
123 |     # Convert miles to kilometers
124 |     km = miles * conversion_factor
125 |     return km
126 | # Sample usage
127 | print("Kilometers to Miles Conversion:")
128 | km_input = 10
129 | print(f"{km_input} kilometers is equal to {km_to_miles(km_input):.2f} miles")
130 | print("\nMiles to Kilometers Conversion:")
131 | miles_input = 10
132 | print(f"{miles_input} miles is equal to {miles_to_km(miles_input):.2f} kilometers")
```

## Output:



```
PS C:\Users\Love\OneDrive\Desktop\AI.AC> ^C
PS C:\Users\Love\OneDrive\Desktop\AI.AC> & C:\Users\Love\AppData\Local\Programs\Python\Python313\python.exe "c:/Users/Love/OneDrive/Desktop/AI.AC/Day 4.py"
Kilometers to Miles Conversion:
10 kilometers is equal to 6.21 miles
Miles to Kilometers Conversion:
10 miles is equal to 16.09 kilometers
PS C:\Users\Love\OneDrive\Desktop\AI.AC> |
```

## Explanation:

This task highlights how clear and specific prompts improve code accuracy.

A vague prompt may produce incomplete or incorrect conversions.

When formulas and requirements are clearly stated, the AI generates:

- Accurate calculations, Reusable functions, Well-documented code

This proves that **prompt specificity directly affects output quality**.