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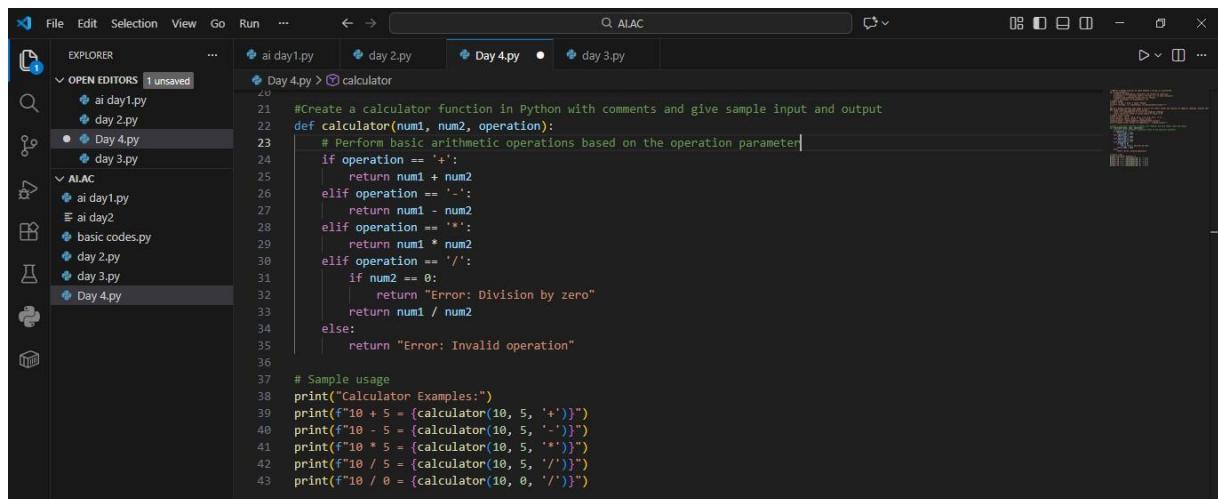
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## ASSIGNMENT -3.2

### Task 1: Progressive Prompting – Calculator Design

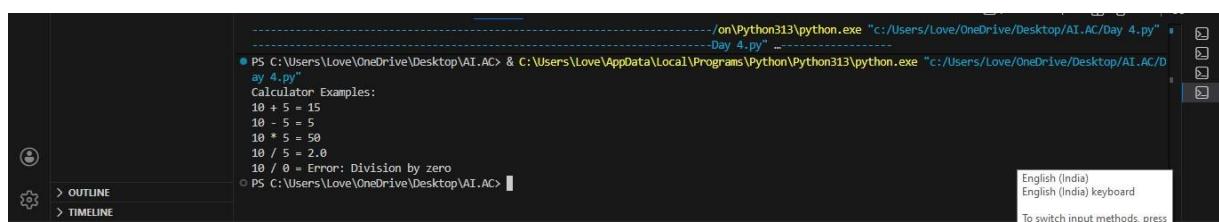
**PROMPT:** Create a calculator function in Python with comments and give sample input and output.



```
#Create a calculator function in Python with comments and give sample input and output
def calculator(num1, num2, operation):
    # Perform basic arithmetic operations based on the operation parameter
    if operation == '+':
        return num1 + num2
    elif operation == '-':
        return num1 - num2
    elif operation == '*':
        return num1 * num2
    elif operation == '/':
        if num2 == 0:
            return "Error: Division by zero"
        return num1 / num2
    else:
        return "Error: Invalid operation"

# Sample usage
print("Calculator Examples:")
print("10 + 5 = {}".format(calculator(10, 5, '+')))
print("10 - 5 = {}".format(calculator(10, 5, '-')))
print("10 * 5 = {}".format(calculator(10, 5, '*')))
print("10 / 5 = {}".format(calculator(10, 5, '/')))
print("10 / 0 = {}".format(calculator(10, 0, '/')))
```

### 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"
Calculator Examples:
10 + 5 = 15
10 - 5 = 5
10 * 5 = 50
10 / 5 = 2.0
10 / 0 = Error: Division by zero
PS C:\Users\Love\OneDrive\Desktop\AI.AC>
```

### 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.

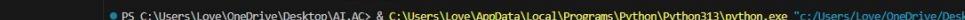


The screenshot shows the Visual Studio Code interface. The Explorer sidebar on the left lists several files under 'OPEN EDITORS': 'ai day1.py', 'day 2.py', 'Day 4.py' (which is currently selected), and 'day 3.py'. Under the 'AI.AC' category, there are 'ai day1.py', 'ai day2.py', 'basic codes.py', 'day 2.py', 'day 3.py', and 'Day 4.py'. The main editor area displays the following Python code:

```
ai day1.py    day 2.py    Day 4.py x  day 3.py

Day 4.py > sort_student_marks
41 print(f"10 / 5 = {calculator(10, 5, '/')}")
42 print(f"10 / 0 = {calculator(10, 0, '/')}"")
43
44 #Write a Python function that sorts a list of student marks in ascending order. Ignore negative values and return the
45 def sort_student_marks(marks):
46     # Filter out negative values and sort in ascending order
47     return sorted([mark for mark in marks if mark >= 0])
48
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 the VS Code interface with the following details:

- Terminal Tab:** The "TERMINAL" tab is selected.
- Terminal Content:**
  - 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/\*.py"
  - Original marks: [85, -5, 92, 78, -12, 88, 95, 0, 72]
  - Sorted marks (no negatives): [0, 72, 78, 85, 88, 92, 95]
- Sidebar:** The sidebar on the left includes icons for "OUTLINE" and "TIMELINE".
- Header:** The top header bar shows tabs for PROBLEMS, OUTPUT, DEBUG CONSOLE, TERMINAL, and PORTS, along with a powershell icon and other standard window controls.

## EXPLANATION:

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

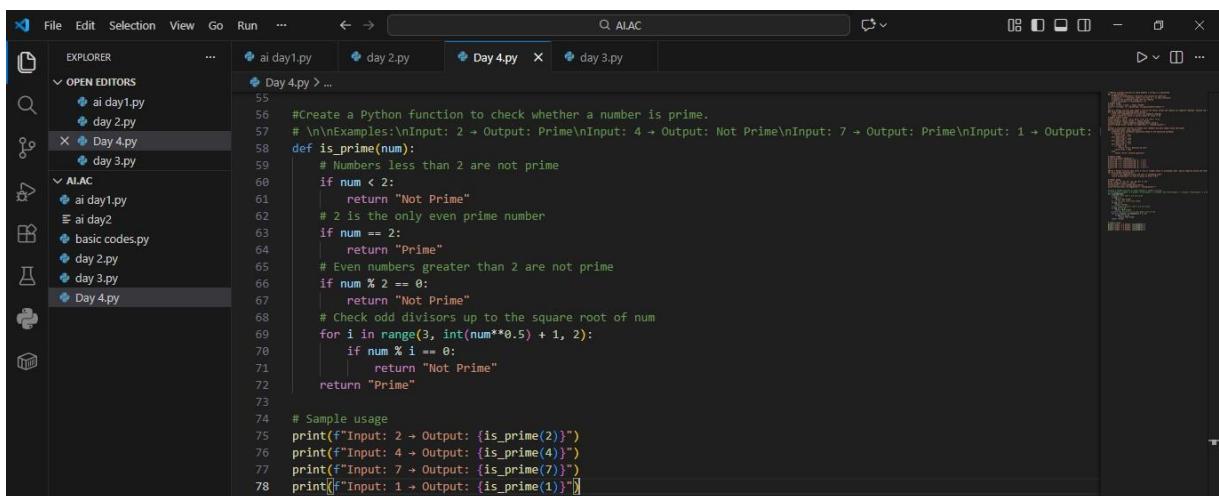
- Sorting order , Data constraints , Output format

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**.

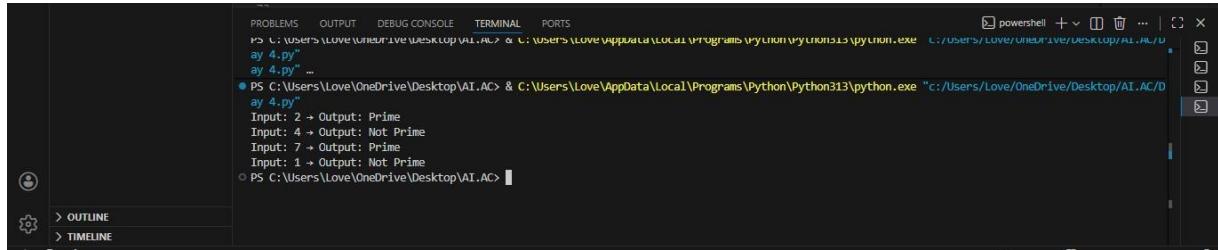
## Task 3: Few-Shot Prompting – Prime Number Validation

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



```
55 #Create a Python function to check whether a number is prime.
56 # \n\nExamples:\nInput: 2 → Output: Prime\nInput: 4 → Output: Not Prime\nInput: 7 → Output: Prime\nInput: 1 → Output:
57 # Numbers less than 2 are not prime
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("Input: 2 → Output: {is_prime(2)}")
76 print("Input: 4 → Output: {is_prime(4)}")
77 print("Input: 7 → Output: {is_prime(7)}")
78 print("Input: 1 → Output: {is_prime(1)}")
```

## OUTPUT:



```
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
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"
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: 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.

```

File Edit Selection View Go Run ... ← → 🔍 ALAC
EXPLORER OPEN EDITORS 1 unsaved
ai day1.py Day 2.py Day 4.py • day 3.py
Day 4 > ...
80 #Create a Python program with a simple user interface that accepts student marks, calculates total marks, percentage, and grade
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()

```

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## Output:

```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
powershell + × └─
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
PS C:\Users\Love\OneDrive\Desktop\AI.AC>

```

## Explanation:

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

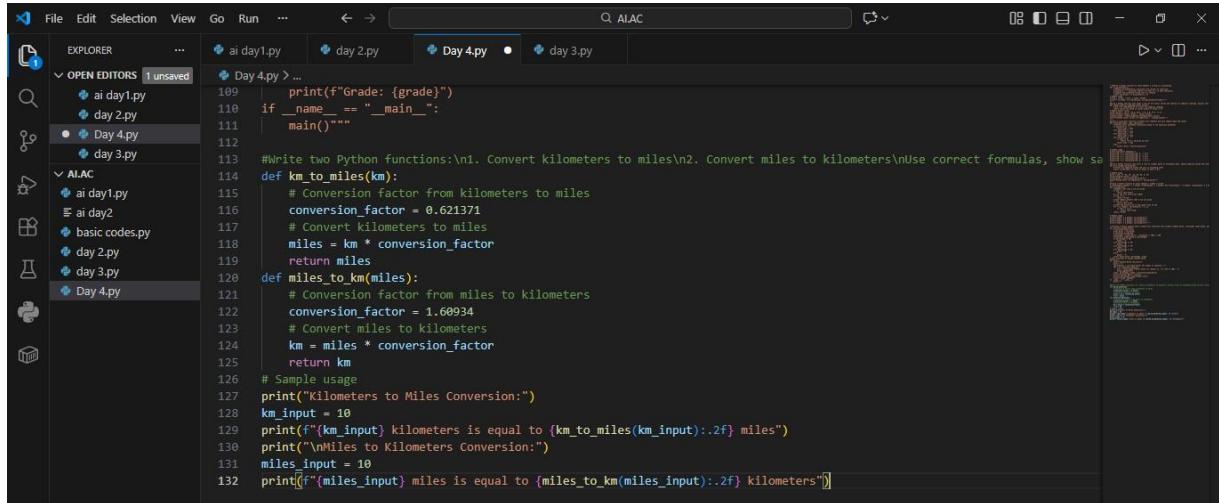
Instead of a graphical UI, a console-based UI is used for:

- Simplicity , Code compatibility , Clear user interaction

## Task 5: Prompt Specificity – Unit Conversion Function

### Prompt:

Write two Python functions:  
1. Convert kilometers to miles  
2. Convert miles to kilometers  
Use correct formulas, show sample input/output, and add comments explaining the logic

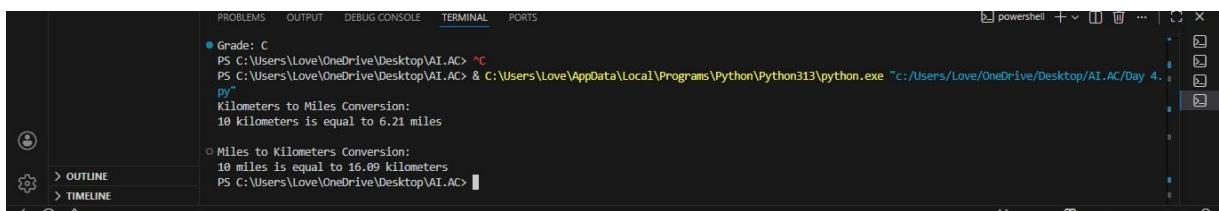


The screenshot shows the VS Code interface with the following details:

- File Bar:** File, Edit, Selection, View, Go, Run, ...
- Search Bar:** AI.AC
- Explorer:** OPEN EDITORS 1 unsaved, showing files: ai day1.py, ai day2.py, Day 4.py (selected), Day 4.py > ..., day 2.py, day 3.py.
- AI.AC:** Shows basic codes.py, ai day1.py, ai day2.py, day 2.py, day 3.py, Day 4.py.
- Code Editor:** Displays Python code for two conversion functions: km\_to\_miles and miles\_to\_km, along with sample usage and output.

```
114 #Write two Python functions:\n1. Convert kilometers to miles\n2.\n115 # Convert kilometers to miles\n116 conversion_factor = 0.621371\n117 # Convert miles to kilometers\n118 miles = km * conversion_factor\n119 return miles\n120 def miles_to_km(miles):\n121     # Conversion factor from miles to kilometers\n122     conversion_factor = 1.60934\n123     # Convert miles to kilometers\n124     km = miles * conversion_factor\n125     return km\n126 # Sample usage\n127 print("Kilometers to Miles Conversion:")\n128 km_input = 10\n129 print(f"\n{km_input} Kilometers is equal to {km_to_miles(km_input):.2f} miles")\n130 print("\nMiles to Kilometers Conversion:")\n131 miles_input = 10\n132 print(f"\n{miles_input} miles is equal to {miles_to_km(miles_input):.2f} kilometers")
```

## Output:



The screenshot shows the terminal output in VS Code:

- PROBLEMS, OUTPUT, DEBUG CONSOLE, TERMINAL, PORTS:**
- Grade: C**
- Terminal Output:**

```
PS C:\Users\Love\OneDrive\Desktop\AI.AC> ^C\nPS 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"\nKilometers to Miles Conversion:\n10 kilometers is equal to 6.21 miles\n\nMiles to Kilometers Conversion:\n10 miles is equal to 16.09 kilometers\nPS 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**.