

SCHOOL OF COMPUTER SCIENCE AND ARTIFICIAL INTELLIGENCE		DEPARTMENT OF COMPUTER SCIENCE ENGINEERING	
ProgramName: B. Tech		Assignment Type: Lab	AcademicYear: 2025-2026
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CourseCode	24CS002PC215	CourseTitle	AI Assisted Coding
Year/Sem	II/I	Regulation	R24
Date and Day of Assignment		Time(s)	
Duration	2 Hours	Applicable to Batches	
AssignmentNumber: 3.3 (Present assignment number) / 24 (Total number of assignments)			

Q.No.	Question	Expected Time to complete
1	<p>Lab 3: Prompt Engineering – Improving Prompts and Context Management</p> <p><b>Lab Objectives:</b></p> <ul style="list-style-type: none"> <li>To understand how prompt structure and wording influence AI-generated code.</li> <li>To explore how context (like comments and function names) helps AI generate relevant output.</li> <li>To evaluate the quality and accuracy of code based on prompt clarity.</li> <li>To develop effective prompting strategies for AI-assisted programming.</li> </ul> <p><b>Lab Outcomes (LOs):</b> After completing this lab, students will be able to:</p> <ul style="list-style-type: none"> <li>Generate Python code using Google Gemini in Google Colab.</li> <li>Analyze the effectiveness of code explanations and suggestions by Gemini.</li> <li>Set up and use Cursor AI for AI-powered coding assistance.</li> <li>Evaluate and refactor code using Cursor AI features.</li> <li>Compare AI tool behavior and code quality across different platforms.</li> </ul>	03.08.2025 EOD

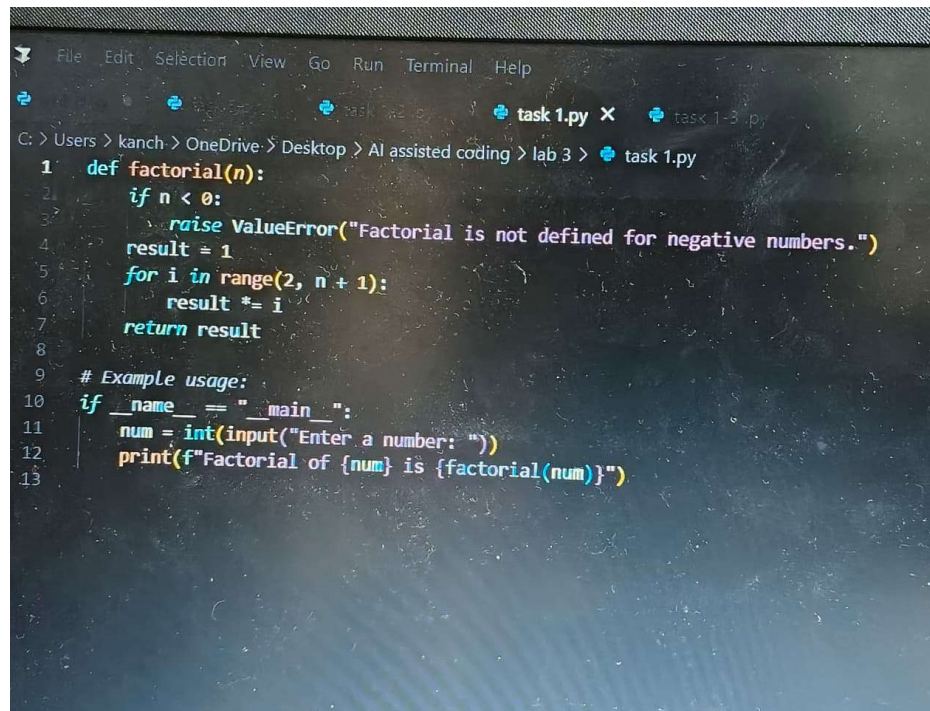
### Task Description#1

- Try 3 different prompts to generate a factorial function.

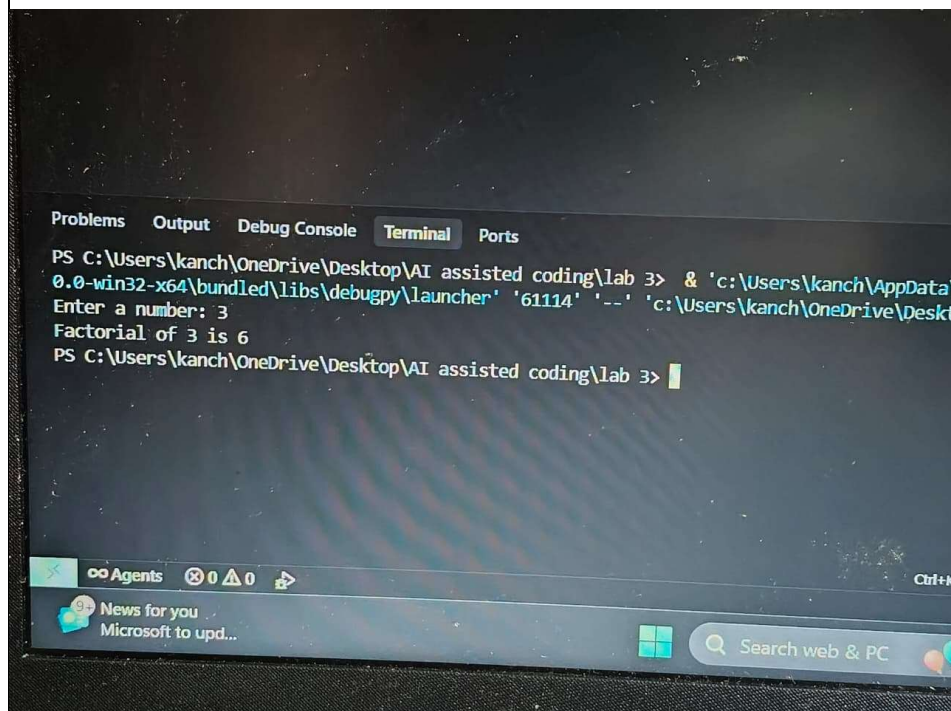
### Expected Output#1

- Comparison of AI-generated code styles

PROMPT 1: Write a python code to calculate factorial of a number

A screenshot of a code editor window. The title bar shows 'File Edit Selection View Go Run Terminal Help'. The file explorer on the left shows a path: 'C:\Users\kanch> OneDrive\Desktop> AI assisted coding> lab 3> task 1.py'. The code in the editor is as follows:

```
1 def factorial(n):
2     if n < 0:
3         raise ValueError("Factorial is not defined for negative numbers.")
4     result = 1
5     for i in range(2, n + 1):
6         result *= i
7     return result
8
9 # Example usage:
10 if __name__ == "__main__":
11     num = int(input("Enter a number: "))
12     print(f"Factorial of {num} is {factorial(num)}")
13
```

A screenshot of a terminal window. The title bar shows 'Problems Output Debug Console Terminal Ports'. The terminal content is as follows:

```
PS C:\Users\kanch\OneDrive\Desktop\AI assisted coding\lab 3> & 'c:\Users\kanch\AppData\Local\Microsoft\WindowsApps\PythonSoftwareFoundation\Python39-win32-x64\python.exe' 'c:\Users\kanch\OneDrive\Desktop\AI assisted coding\lab 3\task 1.py'
Enter a number: 3
Factorial of 3 is 6
PS C:\Users\kanch\OneDrive\Desktop\AI assisted coding\lab 3>
```

PROMPT 2 : Use Python's math module to compute the factorial of a number

```
File Edit Selection View Go Run Terminal Help
task 4.py task 5.py task 1-2.py task 1.py task 1-3.py
> Users > kanch > OneDrive > Desktop > AI assisted coding > lab 3 > task 1-2.py
1 import math
2
3 def compute_factorial(n):
4     return math.factorial(n)
5
6 if __name__ == "__main__":
7     num = int(input("Enter a number: "))
8     print(f"Factorial of {num} is {compute_factorial(num)}")
9
```

```
Problems Output Debug Console Terminal Ports
PS C:\Users\kanch\OneDrive\Desktop\AI assisted coding\lab 3> & 'c:\Users\kanch\AppData\
0.0-win32-x64\bundled\libs\debugpy\launcher' '61114' '--' 'c:\Users\kanch\OneDrive\Deskt
Enter a number: 3
Factorial of 3 is 6
PS C:\Users\kanch\OneDrive\Desktop\AI assisted coding\lab 3> |
```

PROMPT 3 : Implement factorial using static programming in python

```

task 1-3 .py X
C:\Users\kanch> OneDrive > Desktop > AI assisted coding > lab 3 > task 1-3 .py
1 def factorial(n):
    if n < 0:
        raise ValueError("Factorial is not defined for negative numbers.")
    dp = [1] * (n + 1)
    for i in range(2, n + 1):
        dp[i] = dp[i - 1] * i
    return dp[n]
2
3
4 if __name__ == "__main__":
5     num = int(input("Enter a number: "))
6     print(f"Factorial of {num} is {factorial(num)}")
7
8
9
10
11
12

```

```

Problems Output Debug Console Terminal Ports
PS C:\Users\kanch\OneDrive\Desktop\AI assisted coding\lab 3> & 'c:\Users\kanch\AppData\Local\Microsoft\WindowsApps\PythonSoftwareFoundation\Python39-win32-x64\python.exe' 'c:\Users\kanch\OneDrive\Desktop\AI assisted coding\lab 3\task 1-3.py'
Enter a number: 3
Factorial of 3 is 6
PS C:\Users\kanch\OneDrive\Desktop\AI assisted coding\lab 3>

```

**CONCLUSION:** This Python script defines a function `factorial(n)` that calculates the **factorial** of a non-negative integer `n`. The script is a robust and efficient implementation of the factorial function using an iterative approach. It includes input validation for negative values and demonstrates safe, user-friendly handling of edge cases. It is suitable for basic factorial computation tasks and can be extended or integrated into larger applications.

#### Task Description#2

- Provide a clear example input-output prompt to generate a sorting function.



PROMPT : Given a list of integers, write a function that returns the list sorted in ascending order by using built-in sorting functions like sort() or sorted()

```
task2.py X
C:\Users\kanch> OneDrive > Desktop > AI assisted coding > lab 3 > task2.py

def sort_list(arr):
    # Implementing selection sort
    n = len(arr)
    for i in range(n):
        min_idx = i
        for j in range(i+1, n):
            if arr[j] < arr[min_idx]:
                min_idx = j
        arr[i], arr[min_idx] = arr[min_idx], arr[i]
    return arr

# Example usage:
if __name__ == "__main__":
    nums = [5, 2, 9, 1, 5, 6]
    print("Original list:", nums)
    sorted_nums = sort_list(nums.copy())
    print("Sorted list:", sorted_nums)
18 Ctrl+L to chat, Ctrl+K to generate
```

```
18 Ctrl+L to chat, Ctrl+K to generate

Problems Output Debug Console Terminal Ports

PS C:\Users\kanch\OneDrive\Desktop\AI assisted coding\lab 3> & 'c:\Users\kanch\AppData\Local\Programs\Python\Python39\python.exe' 'c:\Users\kanch\OneDrive\Desktop\AI assisted coding\lab 3\task2.py'
Original list: [5, 2, 9, 1, 5, 6]
Sorted list: [1, 2, 5, 5, 6, 9]
PS C:\Users\kanch\OneDrive\Desktop\AI assisted coding\lab 3>

9-25°C
Light rain
Search web & PC
```

### Expected Output#2

- Functional sorting code from AI

### Task Description#3

- Start with the vague prompt “Generate python code to calculate power bill” and improve it step-by-step

PROMPT : Generate power bill in python

```
task 3.py X
C:\Users\kanch> OneDrive\ Desktop > AI assisted coding > lab 3 > task 3.py
def calculate_power_bill(units):
    """
    Calculate the electricity bill based on units consumed.
    Example slab:
    - First 100 units: Rs. 5 per unit
    - Next 100 units (101-200): Rs. 7 per unit
    - Above 200 units: Rs. 10 per unit
    """
    bill = 0
    if units <= 100:
        bill = units * 5
    elif units <= 200:
        bill = 100 * 5 + (units - 100) * 7
    else:
        bill = 100 * 5 + 100 * 7 + (units - 200) * 10
    return bill

if __name__ == "__main__":
    try:
        units = float(input("Enter the number of units consumed: "))
        if units < 0:
            print("Units cannot be negative.")
        else:
            total_bill = calculate_power_bill(units)
            print(f"Total power bill for {units} units is Rs. {total_bill:.2f}")
    except ValueError:
        print("Invalid input. Please enter a numeric value for units.")
```

```
if __name__ == "__main__":
    try:
        units = float(input("Enter the number of units consumed: "))
        if units < 0:
            print("Units cannot be negative.")
        else:
            total_bill = calculate_power_bill(units)
            print(f"Total power bill for {units} units is Rs. {total_bill:.2f}")
    except ValueError:
        print("Invalid input. Please enter a numeric value for units.")
```

Problems Output Debug Console Terminal Ports

```
PS C:\Users\kanch\OneDrive\Desktop\AI assisted coding\lab 3> & 'c:\Users\kanch\AppData\Local\Microsoft\WindowsApps\python3.10.0\python.exe' 'c:\Users\kanch\OneDrive\Desktop\AI assisted coding\lab 3\task 3.py'
Enter the number of units consumed: 500
Total power bill for 500.0 units is Rs. 4200.00
PS C:\Users\kanch\OneDrive\Desktop\AI assisted coding\lab 3>
```

9+ 25°C  
Light rain

### Expected Output#3

- Enhanced AI output with clearer prompts

### Task Description#4

- Write structured comments to help AI generate two linked functions (e.g., login\_user() and register\_user()).

PROMPT : Generate two linked functions in python

```

task 4.py X
C: > Users > kanch > OneDrive > Desktop > AI assisted coding > lab 3 > task 4.py
1 def celsius_to_fahrenheit(celsius):
2     """Convert Celsius to Fahrenheit."""
3     return (celsius * 9/5) + 32
4
5 def fahrenheit_to_celsius(fahrenheit):
6     """Convert Fahrenheit to Celsius."""
7     return (fahrenheit - 32) * 5/9
8
9 # Example of dynamic input and usage:
10 if __name__ == "__main__":
11     choice = input("Convert from (C)elsius or (F)ahrenheit: ").strip().upper()
12     if choice == 'C':
13         c = float(input("Enter temperature in Celsius: "))
14         print(f"{c}°C is {celsius_to_fahrenheit(c):.2f}°F")
15     elif choice == 'F':
16         f = float(input("Enter temperature in Fahrenheit: "))
17         print(f"{f}°F is {fahrenheit_to_celsius(f):.2f}°C")
18     else:
19         print("Invalid choice.")
20
21

```

```

14     c = float(input("Enter temperature in Celsius: "))
15     print(f"{c}°C is {celsius_to_fahrenheit(c):.2f}°F")
16 elif choice == 'F':
17     f = float(input("Enter temperature in Fahrenheit: "))
18     print(f"{f}°F is {fahrenheit_to_celsius(f):.2f}°C")
19 else:
20     print("Invalid choice.")
21

```

Problems Output Debug Console Terminal Ports

```

PS C:\Users\kanch\OneDrive\Desktop\AI assisted coding\lab 3> & 'c:\Users\kanch\AppData\Local\
dled\libs\debugpy\launcher' '60840' '-' 'c:\Users\kanch\OneDrive\Desktop\AI assisted coding\
Convert from (C)elsius or (F)ahrenheit: C
Enter temperature in Celsius: 32
32.0°C is 89.60°F
PS C:\Users\kanch\OneDrive\Desktop\AI assisted coding\lab 3>

```

AnySphere Python has been disabled for this session.

Agents 0 0 0

25°C  
Light rain

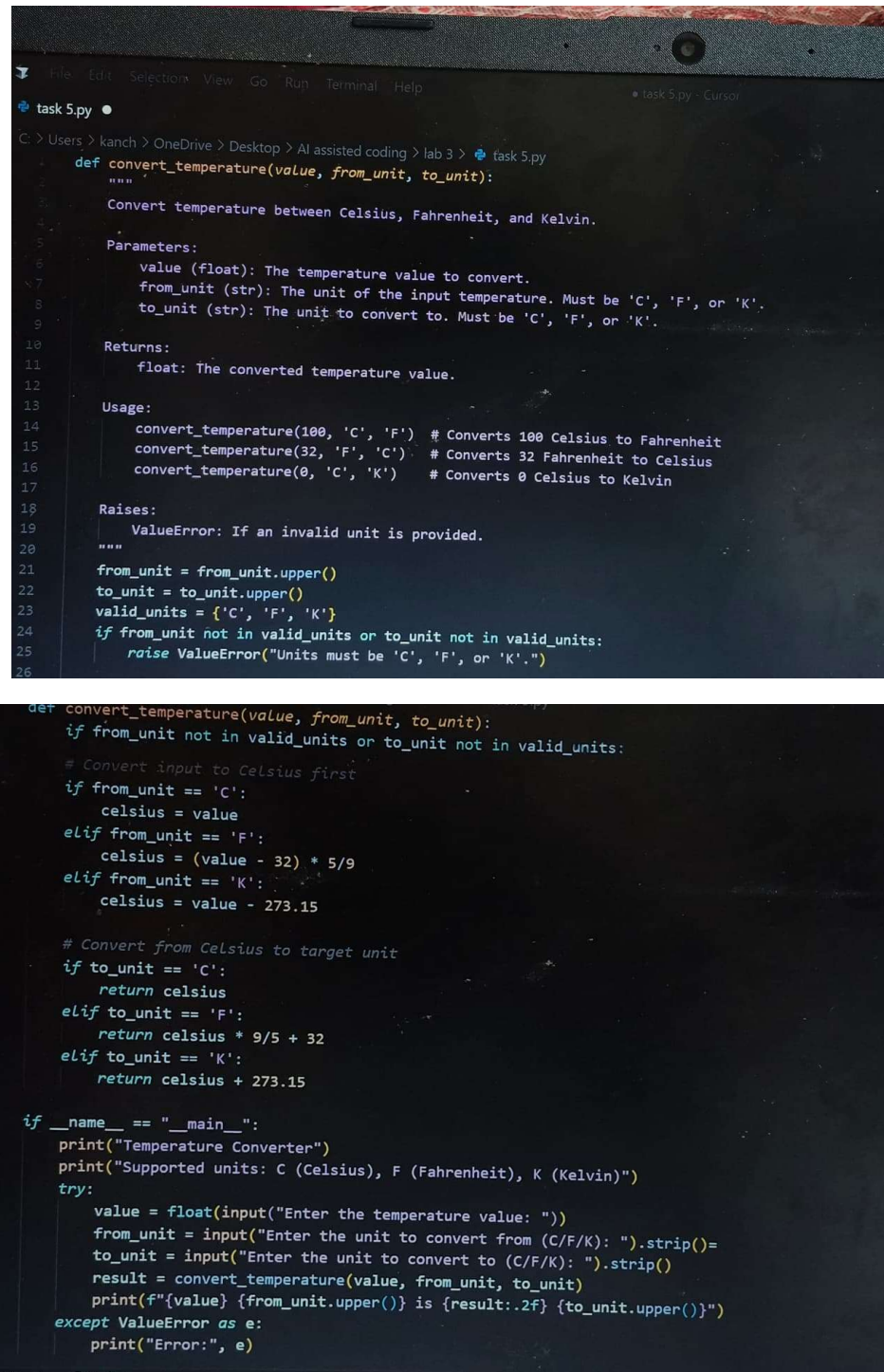
#### Expected Output#4

- Consistent functions with shared logic

#### Task Description#5

- Analyzing Prompt Specificity: Improving Temperature Conversion Function with Clear Instructions

PROMPT : Generate a python code to improve temperature conversion function with clear instruction



```

task 5.py
C: > Users > kanch > OneDrive > Desktop > AI assisted coding > lab 3 > task 5.py
def convert_temperature(value, from_unit, to_unit):
    """
    Convert temperature between Celsius, Fahrenheit, and Kelvin.

    Parameters:
        value (float): The temperature value to convert.
        from_unit (str): The unit of the input temperature. Must be 'C', 'F', or 'K'.
        to_unit (str): The unit to convert to. Must be 'C', 'F', or 'K'.

    Returns:
        float: The converted temperature value.

    Usage:
        convert_temperature(100, 'C', 'F') # Converts 100 Celsius to Fahrenheit
        convert_temperature(32, 'F', 'C') # Converts 32 Fahrenheit to Celsius
        convert_temperature(0, 'C', 'K') # Converts 0 Celsius to Kelvin

    Raises:
        ValueError: If an invalid unit is provided.
    """
    from_unit = from_unit.upper()
    to_unit = to_unit.upper()
    valid_units = {'C', 'F', 'K'}
    if from_unit not in valid_units or to_unit not in valid_units:
        raise ValueError("Units must be 'C', 'F', or 'K'.")

def convert_temperature(value, from_unit, to_unit):
    if from_unit not in valid_units or to_unit not in valid_units:
        # Convert input to Celsius first
        if from_unit == 'C':
            celsius = value
        elif from_unit == 'F':
            celsius = (value - 32) * 5/9
        elif from_unit == 'K':
            celsius = value - 273.15

        # Convert from Celsius to target unit
        if to_unit == 'C':
            return celsius
        elif to_unit == 'F':
            return celsius * 9/5 + 32
        elif to_unit == 'K':
            return celsius + 273.15

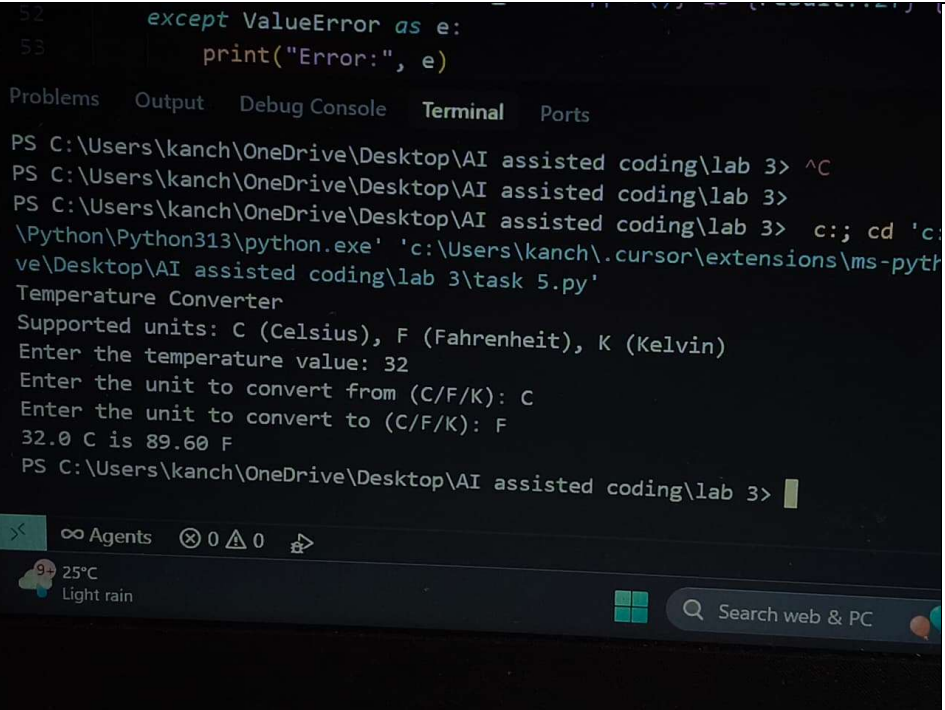
if __name__ == "__main__":
    print("Temperature Converter")
    print("Supported units: C (Celsius), F (Fahrenheit), K (Kelvin)")
    try:
        value = float(input("Enter the temperature value: "))
        from_unit = input("Enter the unit to convert from (C/F/K): ").strip()
        to_unit = input("Enter the unit to convert to (C/F/K): ").strip()
        result = convert_temperature(value, from_unit, to_unit)
        print(f"{value} {from_unit.upper()} is {result:.2f} {to_unit.upper()}")
    except ValueError as e:
        print("Error:", e)
  
```



```
52     except ValueError as e:
53         print("Error:", e)

Problems Output Debug Console Terminal Ports

PS C:\Users\kanch\OneDrive\Desktop\AI assisted coding\lab 3> ^C
PS C:\Users\kanch\OneDrive\Desktop\AI assisted coding\lab 3>
PS C:\Users\kanch\OneDrive\Desktop\AI assisted coding\lab 3> c:: cd 'c:\
\Python\Python313\python.exe' 'c:\Users\kanch\cursor\extensions\ms-pytr
ve\Desktop\AI assisted coding\lab 3\task 5.py'
Temperature Converter
Supported units: C (Celsius), F (Fahrenheit), K (Kelvin)
Enter the temperature value: 32
Enter the unit to convert from (C/F/K): C
Enter the unit to convert to (C/F/K): F
32.0 C is 89.60 F
PS C:\Users\kanch\OneDrive\Desktop\AI assisted coding\lab 3> |
```



**Expected Output#5**

- Code quality difference analysis for various prompts

**Note:** Report should be submitted a word document for all tasks in a single document with prompts, comments & code explanation, and output and if required, screenshots

**Evaluation Criteria:**

Criteria	Max Marks
Factorial Function (Task#1)	0.5
Sorting Function (Task#2)	0.5
Vogue Vs. Specific Prompting (Task #3)	0.5
Linked Functions (Task #4)	0.5
Temperature Conversion Function (Task #5)	0.5
Total	2.5 Marks