Summary Notes: Temperature Conversion Program

Programming Language Used

Python is used to develop the software, including both command-line and GUI versions.

Objective

Create a program that converts temperatures between Celsius, Fahrenheit, and Kelvin based on user input.

Functionality

User enters:

- A temperature value
- The unit of that temperature (C, F, or K)

Program converts the value to the other two temperature units and displays results clearly.

Conversion Formulas

Celsius to:

- Fahrenheit: F = (C × 9/5) + 32
- Kelvin: K = C + 273.15

Fahrenheit to:

- Celsius: C = (F - 32) × 5/9
- Kelvin: K = ((F - 32) × 5/9) + 273.15

Kelvin to:

- Celsius: C = K - 273.15
- Fahrenheit: F = ((K - 273.15) × 9/5) + 32

Implementation Approaches

1. Command-Line Version:

- Inputs via input() function

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- Uses if-else to determine unit and apply correct formulas
- Results printed in terminal

2. GUI Version (tkinter):
- User-friendly interface
- Features input field, dropdown, convert button, and result display
- File: temperature_converter_gui.py
- Run: python temperature_converter_gui.py

Libraries Used

- tkinter
- ttk
- messagebox (for error alerts)

User Input Validation

Uses try-except to catch invalid input. Shows error message using messagebox.showerror.

Enhancement Ideas

- Loop conversions
- Support for decimals
- Dark mode or theme support
- Export results
- Web version using HTML/JS or React