Unit Converter with History Tracking

Project Description

This Unit Converter is a Python-based tool that allows users to perform conversions across three categories: length, weight, and temperature. It also allows user to track their history conversions.

Build States:

1. **Modular Conversion Functions:** Separate functions for length, weight, and temperature conversions. Each function uses a two-step conversion process: a. Convert input to a base unit, for example, meters for length, kilograms for weight. b. Convert from base unit to the target unit.
2. **Constant Based Conversions:** I defined conversion factors as constants at the beginning of the code. Those conversion factors and formulas used in this project were sources from --> See the **Credit and Resources Section**

   a. **Length Conversions:** Meters(m) to / from Kilometers (km), Centimeters(cm), Millimeters(mm), Inches, Feet, Miles

   b. **Weight Conversions:** Kilograms(kg) to / from Grams(gm), Pounds(lb), Ounces(oz)

   c. **Temperature Conversions:** Celsius© to / from Fahrenheit(F), Kelvin(K)

   - I use **global constants** to for conversion factors. These constants are defined at the beginning of program and used throughout the whole conversion functions.
3. **Loop and Error Handling:**
   - The main function (converter()) uses a while loop to keep the program running continuously untill they chooses to exit. It will allow user to perform multiple conversions and store them history(dictionary) without restart the program.
   - The program will check if the user's input matches valid and menu options.
   - I also assumed that users may enter units with inconsistent cases (uppercase or lowercase), thus, the program converts user input to a standardized and valid case to ensure the unit conversion function will work properly.
4. **History Tracking:**
   - I used a dictionary to store the conversion history. The key for each entry is a conversion counter and will increment with each new conversions. The value is a string which can describe the the input and output units of the conversion.

Running Instructions

Prerequisites

- Python 3.x installed on the computer.

Steps to Run the Program

1. Ensure Python is installed.
2. Download the MidtermProject_Riley_Tang.py file
3. Open the terminal or command prompt
4. Run the program following the commands
5. Follow the on-screen prompts to perform conversions, view history, or exit the program.

Sample Runs

Sample Run 1: Length Conversion

This run will demonstrate:

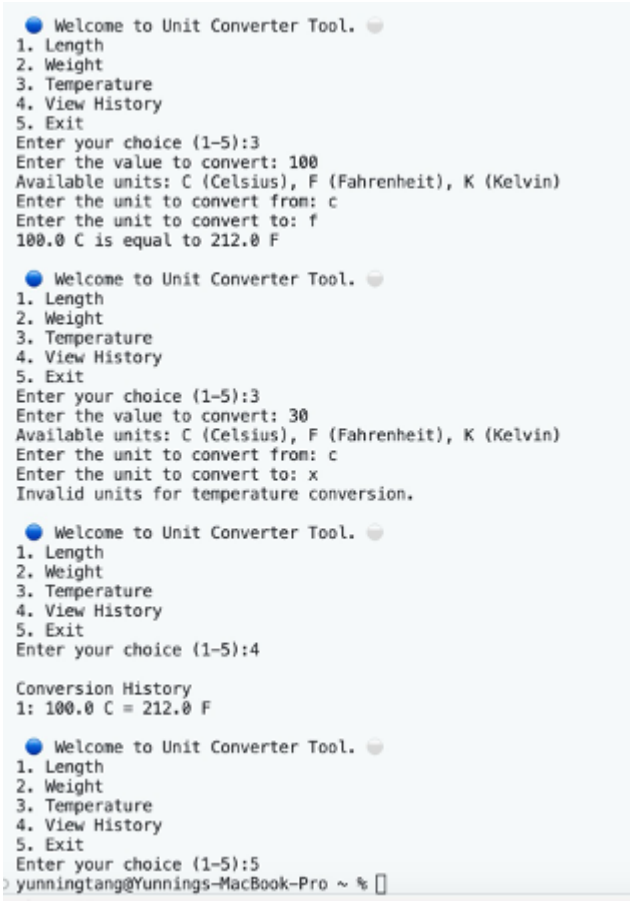
1. A length conversion from meters to feet.
2. Viewing the conversion history
3. Exiting the program

Sample Run 2: Temperature Conversion and Error Handling

This run will demonstrate:

1. A temperature conversion from Celsius to Fahrenheit
2. Attempting an invalid conversion (to unit “X”), showing error handling
3. Viewing the conversion history

4. Exiting the program



Credit and Resources

1. Length and Weight unit conversions

- Inch Calculator: https://www.inchcalculator.com/convert/

2. Temperature conversion formulas

- BYJU'S: https://byjus.com/temperature-conversion-formula/