Lab 4 – Part 2

Using while and for loops to display temperature conversion tables

1. Using a **while loop:** use a while loop to ask the user for the starting Celsius temperature.
    a. The lowest possible Celsius temperature is -273.15 degrees (absolute zero).
    b. If the user enters in a value less than absolute zero, the code must display an error message and require the user to reenter the temperature. The code must continue to loop until the user enters in a valid starting temperature.
2. Using a **while loop:** use a while loop to display a table of the Celsius temperatures from the input starting point through the starting point + 30 and their converted Fahrenheit and Kelvin equivalents.
3. Using a **for loop:** use a for loop to display a table of the Celsius temperatures from the input starting point through the starting point + 30 and their converted Fahrenheit and Kelvin equivalents. NOTE: a **for loop** can only use an **integer** value in the loop.

   The formula for converting a temperature from Celsius to Fahrenheit and Celsius to Kelvin is below.

$$\text{Fahrenehit Temp} = (9/5) * \text{Celsius Temp} + 32$$

$$\text{Kelvin Temp} = \text{Celsius Temp} + 273.15$$

Notes:

- Both loops should produce the same output with two identical tables displayed one after the other (see the examples below).
- All temperatures must be formatted to two decimal places using fstrings (see the example below).

Rubric: The rubric is located on the assignment page in Canvas. Please review the rubric to make sure you meet all the requirements for this lab.

Please submit your py file as well as a similar screen shot of the output.

Screen Shots:

```
IDLE Shell 3.11.1
File  Edit  Shell  Debug  Options  Window  Help
Python 3.11.1 (tags/v3.11.1:a7a450f, Dec  6 2022, 19:58:39) [MSC v.1934 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
= RESTART: I:\!HowardCC\CMSY156-Spring2023\Lab-Ans\CEdwards_156 Lab 4_Part_2_2022.py
Enter in the starting temperature: -300
Error:  Temperatures cannot be below absolute zero.  Please reenter!

Enter in the starting temperature: -40.02

Temperature conversions using a while loop

      Cels      Fahr    Kelvin
    -40.02    -40.04    233.13
    -39.02    -38.24    234.13
    -38.02    -36.44    235.13
    -37.02    -34.64    236.13
    -36.02    -32.84    237.13
    -35.02    -31.04    238.13
    -34.02    -29.24    239.13
    -33.02    -27.44    240.13
    -32.02    -25.64    241.13
    -31.02    -23.84    242.13
    -30.02    -22.04    243.13
    -29.02    -20.24    244.13
    -28.02    -18.44    245.13
    -27.02    -16.64    246.13
    -26.02    -14.84    247.13
    -25.02    -13.04    248.13
    -24.02    -11.24    249.13
    -23.02     -9.44    250.13
    -22.02     -7.64    251.13
    -21.02     -5.84    252.13
    -20.02     -4.04    253.13
    -19.02     -2.24    254.13
    -18.02     -0.44    255.13
    -17.02      1.36    256.13
    -16.02      3.16    257.13
    -15.02      4.96    258.13
    -14.02      6.76    259.13
    -13.02      8.56    260.13
    -12.02     10.36    261.13
    -11.02     12.16    262.13
    -10.02     13.96    263.13

Temperature conversions using a for loop

      Cels      Fahr    Kelvin
    -40.02    -40.04    233.13
    -39.02    -38.24    234.13
    -38.02    -36.44    235.13
    -37.02    -34.64    236.13
    -36.02    -32.84    237.13
    -35.02    -31.04    238.13
    -34.02    -29.24    239.13
    -33.02    -27.44    240.13
    -32.02    -25.64    241.13
    -31.02    -23.84    242.13
    -30.02    -22.04    243.13
    -29.02    -20.24    244.13
    -28.02    -18.44    245.13
    -27.02    -16.64    246.13
    -26.02    -14.84    247.13
    -25.02    -13.04    248.13
    -24.02    -11.24    249.13
    -23.02     -9.44    250.13
    -22.02     -7.64    251.13
    -21.02     -5.84    252.13
    -20.02     -4.04    253.13
    -19.02     -2.24    254.13
    -18.02     -0.44    255.13
    -17.02      1.36    256.13
    -16.02      3.16    257.13
    -15.02      4.96    258.13
    -14.02      6.76    259.13
    -13.02      8.56    260.13
    -12.02     10.36    261.13
    -11.02     12.16    262.13
    -10.02     13.96    263.13

Thank you for using the program
>>>
```

Please submit your py file as well as a similar screen shot of the output.