LAB ASSIGNMENT #10

Points: 10 points
Due Date: April 23, 2020 - 3:30pm
Submissions: Canvas

GOALS:

To get practice writing subroutines and functions and using a two-dimensional array.

Problem

Create a VB console application called “FtoC-converter”. Your program will prompt the user to enter a temperature in degrees Fahrenheit and will convert it to degrees Celsius and display it. In order to accomplish this you need to do the following:

1) Create a subroutine that has the following interface line:

   Private Sub DisplayMessage()

   This subroutine does not have any parameters and its purpose is to print to the terminal screen the following sentences (exactly):

   “Welcome to the Fahrenheit to Celsius temperature converter program! Please enter the temperature in degrees Fahrenheit.”

   This subroutine does NOT prompt or receive any value(s).

2) Enter a one-statement function that accepts the Fahrenheit temperature value (a Double) from the Main and calculates and returns the temperature in degrees Celsius. The code needed is given below. Name this function calculateCelsius

   Private Function calculateCelsius (ByVal tempF as Double) As Double
       Return ((tempF – 32) * 5/9)
   End Function

3) Write the Main subroutine that (1) calls the DisplayMessage() subroutine, (2) prompts and receives from the user the temperature value in degrees Fahrenheit (you may assume “perfect input”), (3) calls the calculateCelsius function, and (4) prints out the converted temperature value. Your output must exactly match the following:

   “X degrees Fahrenheit equals Y degrees Celsius”

   {Note: X and Y represent the two actual temperature values.}

4) Next, we wish to prompt and receive five Fahrenheit temperature values that represent the high temperatures for one work week. Then, we will calculate and ultimately display the corresponding five Celsius temperatures. To accomplish these objectives do the following:

   *) Create a two dimensional array of Doubles. This should be two rows by five columns. Name this array temperatures.
* ) Modify the code in your Main subroutine to have a For-Next loop that will execute the
code that you have written that calls the DisplayMessage subroutine and then prompts
and receives an input Fahrenheit temperature. The input values should be stored in the first
row of the temperature array. Note: This loop needs to execute 5 times.

5) Use another For-Next loop that processes the five stored Fahrenheit values converting them to Celsius
values using the calculateCelsius function. Store these five values in the second row of the array. Your
code should resemble the following:
fahTemp = temperatures (0,0)
celTemp = calculateCelsius(fahTemp)
temperatures (1,0) = celTemp

6) Print the table to the terminal screen. Use nested For-Next loops to do this. To make the table look
“nice”, use the output statement: Console.WriteLine(“{0, -6.##}”, temperatures(row, col))

7) Make sure that you have cleaned up any output statements that remain from the first few steps.

Sample output:

Welcome to the Fahrenheit to Celsius temperature converter program!
Please enter the temperature in degrees Fahrenheit. 100
Welcome to the Fahrenheit to Celsius temperature converter program!
Please enter the temperature in degrees Fahrenheit. 0
Welcome to the Fahrenheit to Celsius temperature converter program!
Please enter the temperature in degrees Fahrenheit. 32
Welcome to the Fahrenheit to Celsius temperature converter program!
Please enter the temperature in degrees Fahrenheit. 212
Welcome to the Fahrenheit to Celsius temperature converter program!
Please enter the temperature in degrees Fahrenheit. 50

100.00   0.00   32.00   212.00   50.00
37.78   32.00   0.00   100.00   10.00

8) Extra Credit: Modify your output so that the line “Welcome to the Fahrenheit to Celsius …” is written
just one time. Hint: It should be taken out of the subroutine. Next, change the output so that it looks
like the following:

Temperatures (F):  100.00   0.00   32.00   212.00   50.00
Temperatures (C):  37.78   32.00   0.00   100.00   10.00

Submission:

1) Copy and paste your source code into an MS word document named Lab10-yourLastName.docx. Snap-
shot a test run and include it in your document.
2) Upload this file to Canvas.