Alice Uhl

Fahrenheit to Celsius Converter
Project 2
October 09, 2014

Introduction:

This is a project for Introduction to Programming (CS115).The application was created in Visual Studio using visual basic. This assignment demonstrates competency using Microsoft Excel to create data dictionaries and test plans. Additionally, data flowcharts were created using Microsoft Visio. This project demonstrates concepts such as If/ Then statements, variables, and calculating and outputting different data-types.

Data Dictionary	Type	Description		Initial value
frmFahrenheitCelsiusConverter	form	main form	n/a	text: "Fahrenheit to Celsius Converter"
lblDegreesFahrenheit	label	Label for degrees fahrenheit	frmFahrenheitCelsiucConverter	text: "Degrees Fahrenheit"
lblDegreesCelsius	label	Label for degrees celsius	frmFahrenheitCelsiucConverter	text: "Degrees Celsius"
lblName	label	Label for name, class, section, quarter	frmFahrenheitCelsiucConverter	text: "Alice Uhl CS 115D Fall, 2014"
txtFahrenheit	text box	Textbox to input fahrenheit	frmFahrenheitCelsiucConverter	32.0
txtCelsius	text box	Textbox to input celsius	frmFahrenheitCelsiucConverter	0.0
btnCalculateFahrenheit	button	Button to calculate fahrenheit	frmFahrenheitCelsiucConverter	text: "Calculate Fahrenheit"
btnCalculateCelsius	button	Button to calculate Celsius	frmFahrenheitCelsiucConverter	text: "Calculate Celsius"
btnExit	button	Button to exit	frmFahrenheitCelsiucConverter	text: "Exit"
sngFahrenheit	single	Single Fahrenheit	frmFahrenheitCelsiucConverter	0.0
sngCelsius	single	Single Celsius	frmFahrenheitCelsiucConverter	0.0
sngAbsoluteZeroCelsius	single	Single Absolute Zero in Celsius	frmFahrenheitCelsiucConverter	-273.15

Test Plan

Test Plan: Test input values of fahrenheit.						
Input	**Expected Output**		**Actual output**		**Reason for test**	**Reason for difference**
Fahrenheit	**Fahrenheit**	**Celsius**	**Fahrenheit**	**Celsius**		
0	0.0	-17.8	0.0	-17.8	test 0	n/a
32	32.0	0.0	32.0	0.0	melting point	n/a
212	212.0	100.0	212.0	100.0	boiling point	n/a
1	1.0	-17.2	1.0	-17.2	test 1	n/a
-459.00	-459.0	-272.8	-459.0	-272.8	above absolute zero	n/a

-460.00	Message Box: "Cannot go below absolute zero" appears	Message Box: "Cannot go below absolute zero" appears	Message Box: "Cannot go below absolute zero" appears	Message Box: "Cannot go below absolute zero" appears	below absolute zero	n/a
40	40.0	4.4	40.0	4.4	test positive	n/a
-40	-40.0	-40.0	-40.0	-40.0	test negative	n/a
xxx	0.0	-17.8	0.0	-17.8	non-numeric input	n/a
4.0e999	out of range	out of range	0.0	-17.8	out of range	treatment of overflow
<blank>	0.0	32.0	0.0	-17.8	no input	n/a
Click the "Exit" button closes the program.						
The "Exit" is button is the Cancelbutton. Pushing the "esc" key closes the program.						
Test Plan: Test input values of celsius.						
Input	**Expected Output**		**Actual output**		**Reason for test**	**Reason for difference**
Celsius	**Celsius**	**Fahrenheit**	**Celsius**	**Fahrenheit**		
0	0.0	32.0	0.0	32.0	melting point	n/a
100	100.0	212.0	100.0	212.0	boiling point	n/a
1	1.0	33.8	1.0	33.8	test 1	n/a
-273.0	-273.0	-459.4	-273.0	-459.4	above absolute zero	n/a
-274.0	Message Box: "Cannot go below absolute zero" appears	Message Box: "Cannot go below absolute zero" appears	Message Box: "Cannot go below absolute zero" appears	Message Box: "Cannot go below absolute zero" appears	below absolute zero	n/a
40	40.0	104.0	40.0	104.0	positive number	n/a
-40	-40.0	-40.0	-40.0	-40.0	negative number	n/a
xxx	0.0	32.0	0.0	32.0	non-numeric input	n/a
4.0e999	out of range	out of range	0.0	32.0	out of range	treatment of overflow
<blank>	0.0	32.0	0.0	32.0	no input	n/a
Clicking the "Exit" button closes the program.						
The "Exit" is button is the Cancelbutton. Pushing the "esc" key closes the program.						

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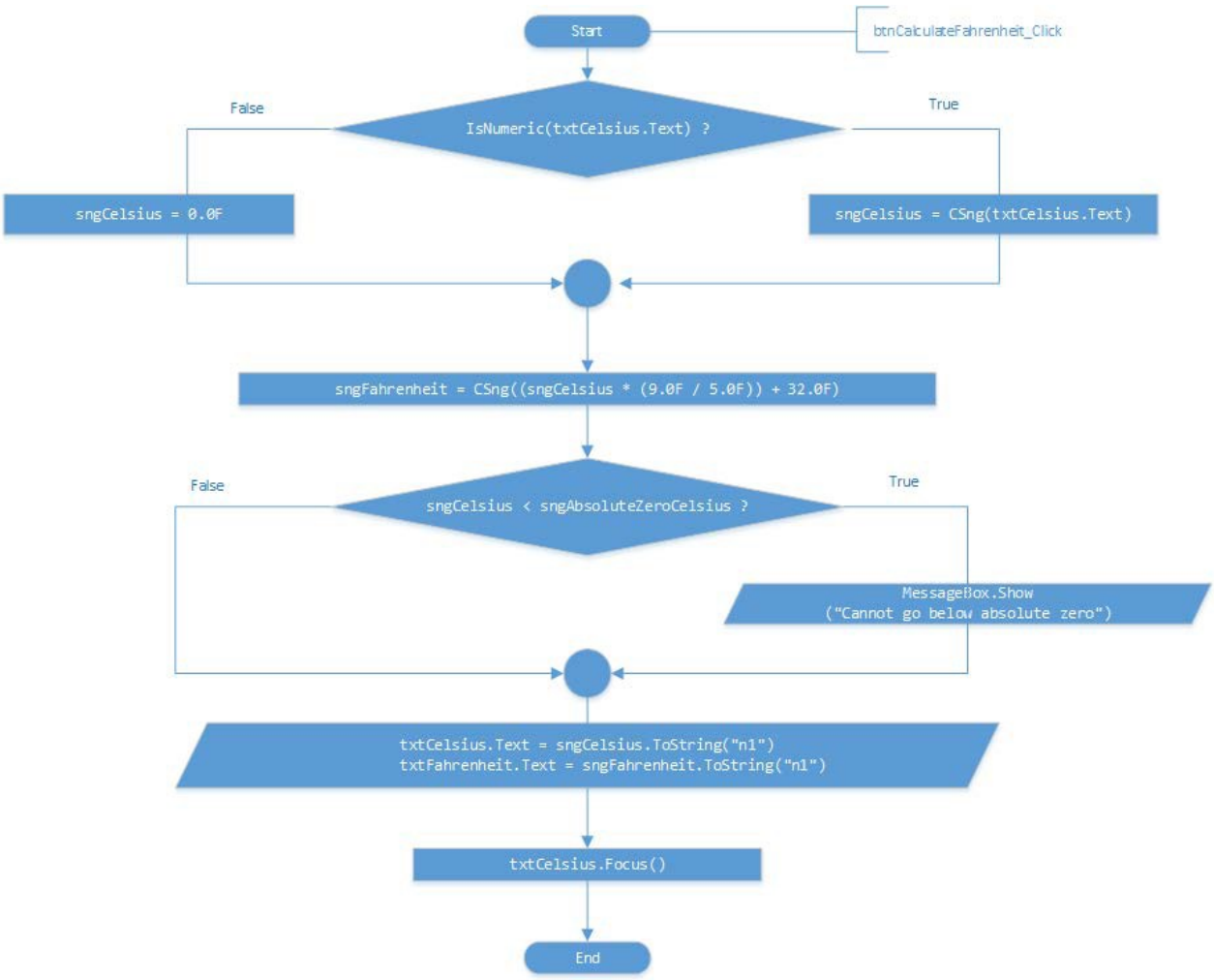
Flowchart: Fahrenheit Conversion



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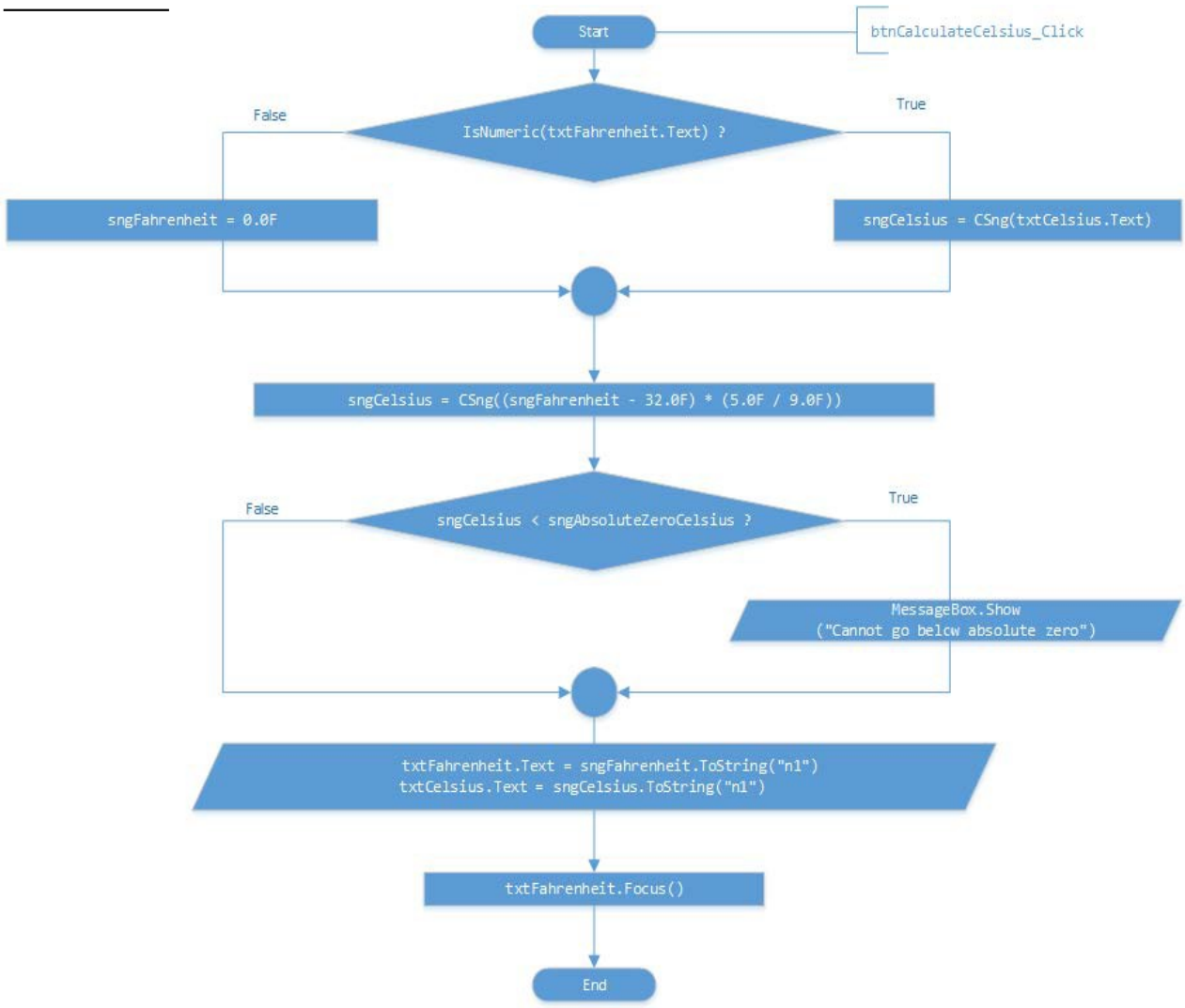
Flowchart: Celsius Conversion

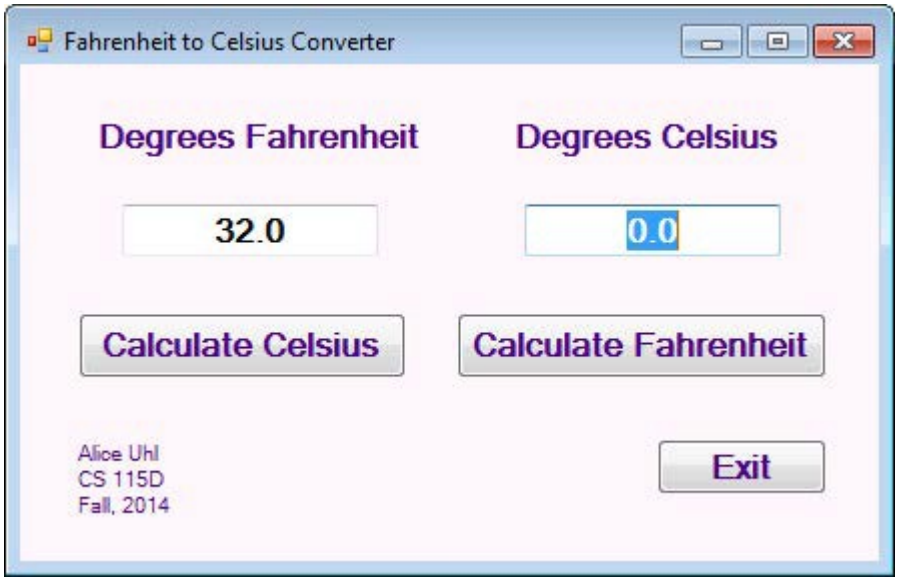


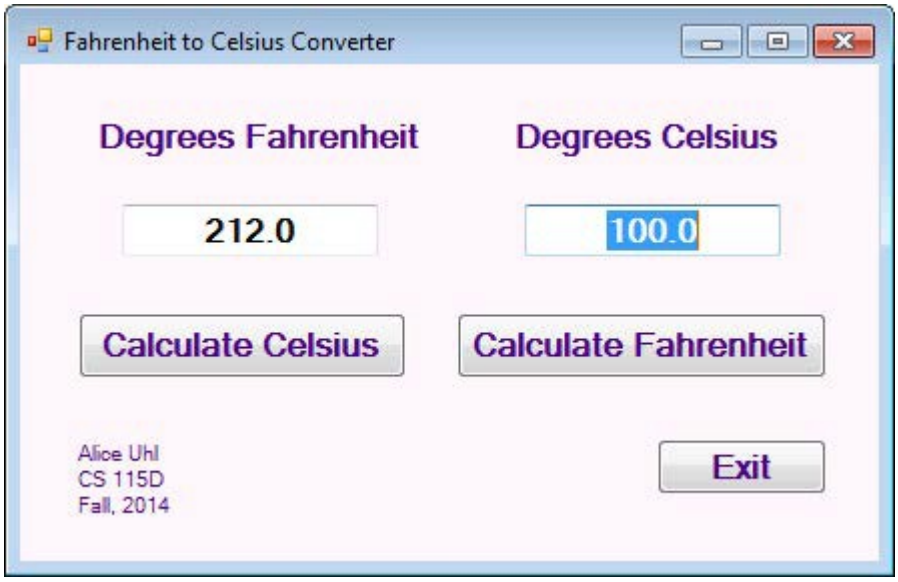
Visual Basic

```
Option Strict On
Option Explicit On

'--------------------------------------------------------------------------
' Fahrenheit/Celsius Conversion
' by Alice Uhl
' Version 1.0
' compiled using MS Visual Studio 2012
' tested on Intel Xeon PC running MS Windows 7
' CS 115 Section D
' Completed 10/09/2014
' Convert between the temperatures of fahrenheit and celsius
'--------------------------------------------------------------------------

Public Class frmFahrenheitCelsiusConverter
    '--------------------------------------------------------------------------
    'Variables
    '--------------------------------------------------------------------------
    Private sngFahrenheit As Single = 0
    Private sngCelsius As Single = 0
    Private sngAbsoluteZeroCelsius As Single = -273.15
    '--------------------------------------------------------------------------
    'Calculate Celsius Button
    '--------------------------------------------------------------------------
    Private Sub btnCalculateCelsius_Click(sender As Object, e As EventArgs) _
        Handles btnCalculateCelsius.Click

        If IsNumeric(txtFahrenheit.Text) Then
            sngFahrenheit = CSng(txtFahrenheit.Text)
        Else
            sngFahrenheit = 0.0F
        End If
        '--------------------------------------------------------------------
        'Formula for converting fahrenheit to celsius
        sngCelsius = CSng((sngFahrenheit - 32.0F) * (5.0F / 9.0F))

        '--------------------------------------------------------------------
        'Message Box: Temperature cannot go below absolute zero
        If sngCelsius < sngAbsoluteZeroCelsius Then
            MessageBox.Show("Cannot go below absolute zero")
        End If

        '--------------------------------------------------------------------
        txtFahrenheit.Text = sngFahrenheit.ToString("n1")
        txtCelsius.Text = sngCelsius.ToString("n1")
        txtFahrenheit.Focus()

    End Sub

    '--------------------------------------------------------------------------
    'Calculate Fahrenheit Button
    '--------------------------------------------------------------------------
    Private Sub btnCalculateFahrenheit_Click(sender As Object, e As _
```

```
        EventArgs) Handles btnCalculateFahrenheit.Click

        If IsNumeric(txtCelsius.Text) Then
            sngCelsius = CSng(txtCelsius.Text)
        Else
            sngCelsius = 0.0F
        End If
        '-----------------------------------------------------------------------
        'Formula for converting celsius to fahrenheit
        sngFahrenheit = CSng((sngCelsius * (9.0F / 5.0F)) + 32.0F)

        '-----------------------------------------------------------------------
        'Message Box: Temperature cannot go below absolute zero
        If sngCelsius < sngAbsoluteZeroCelsius Then
            MessageBox.Show("Cannot go below absolute zero")
        End If

        '-----------------------------------------------------------------------
        txtCelsius.Text = sngCelsius.ToString("n1")
        txtFahrenheit.Text = sngFahrenheit.ToString("n1")
        txtCelsius.Focus()
    End Sub
    '-------------------------------------------------------------------------
    'Exit Button
    '-------------------------------------------------------------------------
    Private Sub btnExit_Click(sender As Object, e As EventArgs) _
        Handles btnExit.Click

        'Closes the program
        Me.Close()
    End Sub
End Class
```

Output:




Fahrenheit to Celsius Converter
Degrees Fahrenheit
Degrees Celsius
212.0
100.0
Calculate Celsius
Calculate Fahrenheit
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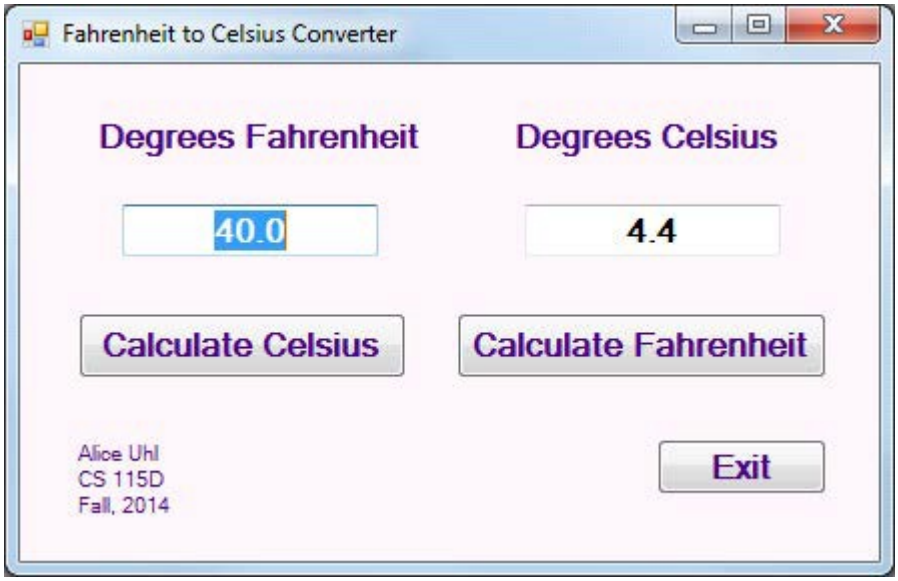
CS 115D
Fall, 2014
Exit


Fahrenheit to Celsius Converter
Degrees Fahrenheit
Degrees Celsius
40.0
4.4
Calculate Celsius
Calculate Fahrenheit
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Fall, 2014
Exit