Homework #1

LabVIEW Dr. Pogo

Assignment is due on Tuesday, September 2, 2008 Assigned August 26, 2008

Assignment #1: Voltage to Temperature Conversion

Inputs: One Floating Point (knob with digital display).
One Listbox (4 elements: Celsius, Kelvin, Fahrenheit, Rankine)
One Stop Button

Outputs: One Floating Point (thermometer slider with digital display).
One Boolean (warning light)
One String (units for thermometer)

The floating point input represents a voltage. Although this voltage is set and adjusted by the user, it is supposed to represent an input from an external electric circuit. This imaginary circuit is supposedly designed so that this voltage changes in response to temperature according to this equation:

$$T\,(^{\circ}C) = 115.7V + 8.67V^2 \qquad (-1\text{volt} = V = +1\text{volt})$$

As noted, this equation is only believed to be valid for a limited range of voltages. If the voltage is ever observed to be outside this range, we cannot determine the correct temperature.

The user input (the dial) should allow voltages between −2 and +2 volts. If this input voltage ever falls outside the expected range, the output temperature must "peg" at the −1v or +1v value, as appropriate. If this happens, a warning light should also turn on while the voltage remains in the unexpected range. The warning light should have text labels "Normal", and "Warning!" and change from green to red when activated.

The output should be correct to two decimal places, regardless of which temperature unit the user has selected. The thermometer slider output should range from −200 to +800.

Finally, you may not use the "coerce" node.

Here is an example of how your front panel might appear: