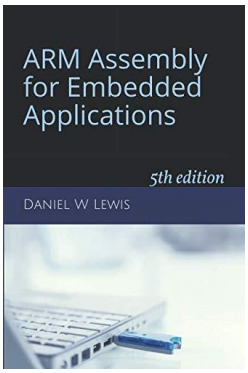


Programming Lab #8b

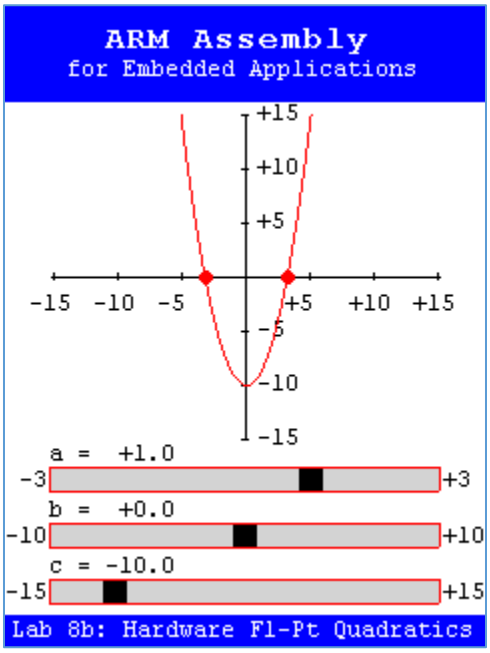
Solving Quadratics Using Hardware Floating-Point

Topics: Floating-point instructions

Prerequisite Reading: Chapters 1-9

Revised: May 22, 2020

This assignment is very similar to Lab 4a except that (1) it uses floating-point instructions instead of integer instructions, and (2) the function used in Lab 4a to compute the integer square root is no longer needed since you can use the `VSQRT.F32` instruction instead.



Create a single ARM Cortex-M4 assembly source code file containing the four functions whose function prototype declarations appear below:

`float Root1(float a, float b, float c) ;`

Computes the root given by $\frac{-b+\sqrt{Discriminant(a,b,c)}}{2a}$

`float Root2(float a, float b, float c) ;`

Computes the root given by $\frac{-b-\sqrt{Discriminant(a,b,c)}}{2a}$

`float Quadratic(float x, float a, float b, float c) ;`

Computes the quadratic, $ax^2 + bx + c$

`float Discriminant(float a, float b, float c) ;`

Computes the value of the discriminant, $b^2 - 4ac$
Functions Root1 and Root2 should call this function.

These functions are called by a main program download from here. If your code is correct, the display should look similar to the image shown, the sliders can be used to vary the coefficient values, and pressing the blue pushbutton will restore the initial conditions. Otherwise, incorrect return values will cause an error message to be displayed as white text on a red background and the program will be halted.