Lab 4 Prelab: PIC32 Timers

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# Goal and Background Information

The goal of this lab is to implement a synchronized multi-rate control system by using timer 1 interrupt flag. This interrupt flag will go high every millisecond and us used to decrement two counting variables called buttonTimer, and stepperDelay. When the btnTimer variable reaches zero the program executes the readButtons() function, executes the decodeButtons() functions, and lastly resets the btnTmer to 100. When the stepperDelay variable reaches zero then the program executes the stepperStateMachine() function, executes the outputToStepper() function and sets the stepTimer to the desired delay in milliseconds to reach a specified RPM.

Timer 1 interrupt flag for this lab will be obtained in this lab by using a macro called mT1GetIntFlag(). It is important to note that equation 1 in the lab handout shows how to calculate how long the timer 1 takes to increment once. Also, while deciding on what to make the timer 1 period it is important to remember that the clock will increment the number of times equal to the PRx value +1 because it starts counting from zero. Most of the code from this lab is already written. The main difference between this lab and the last one is that this has a different scheduling method.

**Data Flow Diagram**

Diagram

Description automatically generated

**Control Flow Diagram**

**Diagram

Description automatically generated**