Problem 1 (15%)  
Write a program that will test the overflow on the HB for the int data type. Now that you have learned how to write loops and conditional statements you should be able to write a test program without having to interact with it.

**Turn In:** Printout of program, also copy your program `username_PS5_P1.c` to `\CDIO-Prime\16.070HW\ps5\p1`. Indicate how much time you spent on this problem.

Problem 2 (20%)  
Write a program that will debounce the HB’s start-button when pressed. Refer to pages 144 and 145 in Laplante for a description of the debouncing process. This code is essential for your final problem set (project).

**Turn In:** Printout of program, also copy your program `username_PS5_P2.c` to `\CDIO-Prime\16.070HW\ps5\p2`. Indicate how much time you spent on this problem.

Problem 3 (25%)  
You have been given the HB and asked to write a program that will test the reaction times of candidates for the space program. You will do this by having the candidates hold down the start button for 10 seconds, at which point a beep() command will be issued. Once the beep command is issued the candidate must press the stop button. The time between the beep and the stop button press will be the reaction time. This should be written to the display screen in seconds.

**Hint:** See section 5.7 (starting at p20) of your HB Technical Reference for the library functions that you will need to perform this programming task.

**Turn In:** Printout of program, also copy your program `username_PS5_P3.c` to `\CDIO-Prime\16.070HW\ps5\p3`. Indicate how much time you spent on this problem.

*Problem 4 on next page*
Problem 4 (40%)
The following problem should be considered a requirement specification for a software design problem.

Design a program that will allow a user to set the frequency of the beeper on the HB by turning the user knob. Initially the beeper should be turned off, but can then be turned on using the start button. Once the beeper is on the display should count up the amount of time that it is on and the frequency that it is at. Once the beeper is on the user should be able to change the frequency using the knob and also be able to turn off the beeper with the stop button.

Turn In: Printouts of the 5 steps of software design as detailed in Recitation 2. You may choose any one of the following three methods of implementing part 2 of step 3 (Design): Pseudo-code, Flow chart or State diagrams. Indicate the amount of time you spent working on this problem.

Also: Copy your program code as username_PS5_P4.c to \CDIO-Prime\16.070HW\ps5\p4, replacing username with your Athena username.