

Practical 7

The functionality we'll be implementing in this prac is very similar to that which has been implemented before in assembly - we're just doing it in C now. It may be useful to you to try to port that carefully crafted assembly code into C.

For the following, only one switch will be interacted with at a time.

Part 1: (2)

The LEDs should be initialised to display 0xC0.

If SW0 is held down, the LEDs should be made to increment whatever value happens to be currently displayed by 1. Incrementing should be every 0.5 seconds (+2%). You should use a delay loop. Please pull your delay out into a function.

If SW0 is not held, the LEDs should just remain unchanged.

Part 2: (1)

If SW1 is held down, the LEDs should be made to reset back to 0xC0.

Part 3: (3)

While SW2 is held down, POT0 should be sampled and value displayed on the LEDs proportional to the output voltage of the pot. Display 0 if the pot is outputting 0 V, 0xFF is the pot is outputting 3.3 V. Linear in between.

Releasing SW2 should not do anything fancy: just leave the last sampled value on the LEDs.

Part 4: (2)

While SW3 is held down, POT1 to be sampled, but displayed in the opposite way to above:

If the pot is outputting 0 V, 0xFF should be displayed.

If the pot is outputting 3.3 V, 0 should be displayed.

Linear in between.

Releasing SW3 should not do anything fancy: just leave the last sampled value on the LEDs.

Bonus: (1)

The first time your code is loaded onto the dev board the LEDs should initialise to 0xC0 as instructed in part 1.

However, from then on, when the board is power cycled the LEDs should not initialise to 0xC0 but rather should return to whatever value was being displayed when the board was powered off.

Leave part 2 unchanged.

Marked out of: 8

Available marks: 9