Prac Exam: Wednesday

You can assume that only one push-button will be interacted with at a time.

Part 1: (1)
On reset, the LEDs should display the pattern 0xF0

Part 2: (2)
While SW0 is **held**, the LEDs should be changed to a number proportional to the voltage from **POT0**.
When the pot is outputting 0 V, the LEDs should display 0x00.
When the pot is outputting 3.3 V the LEDs should display 0xFF. Linear in between.
(Hint: as we only have 1 byte of LEDs. What is a suitable ADC configuration?)

Part 3: (1)
While SW1 is **held,** decrement the value on the LEDs by 1 every 0.5 seconds.
Suggested implementation:
The timer is always triggering an IRQ. In the ISR, check if SW1 is held and conditionally subtract 1 from LEDs.

Part 4: (2)
Extend the above such that the decrementing rate is controlled by **POT0**
When the pot is outputting 0 V the LEDs should be decremented every 0.125 s.
When the pot is outputting 3.3 V the LEDs should be decremented every 0.5 seconds.

Part 5: (2)
Every time SW2 is **pressed**, add **2** to the value on the LEDs.
The additions should happen on the falling edge: ie: when the button is PRESSED. Holding the button should have no effect. You will need to debounce noisy edges.

Part 6: (2)
While SW3 is held, display the absolute value of the difference between the values produced by pot0 and pot1.
When one of the pots is outputting 0 V and the other is outputting 3.3 V, the difference is 0xFF. When both pots are outputting the same voltage, the difference is 0.
Linear in between.
In other words: LEDs = | pot0 - pot1 |

Bonus (1)
Display the following on the LCD screen:
I am 1337

Marked out of: 10
Available marks: 11

DO NOT TURN OVER

Until Instructed