

Please build a system which does the following, using a scheduler:

1. Three ADC channels should be sampled every 100 milliseconds.
2. Pressing keys 0 to 2 in the serial terminal should display the current value of each channel, and the average value of the last ten samples from that channel.
3. The current average value of channel 0 should be displayed on the PCA9532 LEDs.
4. Using a suitable method, the program should also calculate the rate of change of each ADC channel. In the steady state, the RGB LED should be green and the 7-segment display should display nothing. If the rate of change for one of the channels becomes positive, the LED should become red and the channel number should be indicated on the 7-segment display, both for at least 1 second (or longer, if the channel change lasts longer than a second). If the rate of change becomes negative, the LED should become blue and the channel number should be displayed as before. In either of these cases, the channel number and the rate of change should be displayed on the serial terminal.

Notes: Items 2 and 3 will require you to keep a running average of the values being read in. The running average should be updated every time a new ADC value is sampled. Item 4 requires you to use "a suitable method" for determining the rate of change. I will leave it up to you to decide what that method is, and will talk to you in the final lab session about what method you have chosen and why. Code should be submitted by **the end of Wednesday the 21st of March** - I will then talk to you in the lab session on Thursday about your solution, and will mark the code afterwards. Please also fill in the feedback survey below!

Edit 9/3/18 - I have attached some C code showing how to use a ring buffer.