COSC 326 Etude 9: Pulses Counting

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In this etude, we have a main function that opens a file using the Python command line argument. Each line in the input is added to an array called *data*. A low pass filter is applied to the array, and the array is then passed onto *get_peaks*, which returns the positions and height of each peak. Finally, *plot_data* plots all the values in the data, along with the position of each peak, shown with a red dot.

lowpass function

This function takes an array and applies a low-pass filter to it. The parameters for the low-pass filter were determined through trial and error. The function then returns the filtered array.

get_peaks function

This function uses the scipy function *find_peaks*, which finds every local maxima by simply comparing with neighbouring values. *find_peaks* uses multiple parameters in finding local maxima, and the correct parameters were determined using trial and error. After some testing, we found parameters that worked for all datasets.

From the find_peaks function, we create arrays which store the heights and position of each peak, and store it in the variables *heights* and *peak_positions*.

plot_data function

This function plots the data as a line graph along with the peaks, or pulses. It creates an array called *indexes* which stores the index for each datapoint to use when plotting the line graph. It then plots the data with indexes on the x axis, and the value for each datapoint on the y axis. The function also indicates the position of each peak to the graph as a red dot.