

COSC326 Etude 9 - Pulses Counting
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For this etude I have a main method calling my pulses method in which I read data from a txt file, transform this data into integer format and put it into a list. I find the mean of this data then plot it and call my get_smooth method.

My smoothing method removes data points that are lower than the mean as they may interfere with my averaging process. I do this by changing them to have the value of the mean and then averaging all of the data points with their 4 surrounding data points (2 on either side, the edge points are averaged using less points).

I find the mean of this smooth data and plot both the smooth data and the mean of it and then I count the peaks. To do this I find instances where 1 data point is above the smooth data's mean and then the next one is below it. Each of these instances is counted as a pulse and the number of pulses is incremented by one each time and then printed out at the end.

My reasoning for smoothing was to merge pulses that were really close together so that they weren't counted as two pulses and to attempt to smooth out the random noise. Also I removed the low data points because they may have interfered with the high peaks I was interested in, because I didn't count the low troughs as pulses. I used the mean of the smooth peaks to judge whether a peak was a pulse because it is halfway up the data no matter the data and seemed like a good indicator. I used the two on either side of the data points when averaging because the pulses tended to occur once every 8 data points, meaning pulses that weren't meant to be merged weren't merged.