

Median + low pass filter design:

First I tried mean filter with a window of 10.

Then median filter with a window of 10.

By hit and trial saw that 10 was a good window size because higher meant significant loss of volume of actual signal and lower meant no significant reduction in noise.

Then designed a bandpass filter using butter command

Saw that butter command's low pass filter gave much better results than bandpass.

So with help of the code for low pass filter that Sir uploaded on moodle, designed manual low pass filter.

This works as follows:

- 1) compute fft and use fftshift to center the signal at zero.
- 2) identify a suitable range or upper limit of frequencies you want to preserve. (by hit and trial)
- 3) design an array of 1's encompassing this range (the filter).
- 4) multiply with the fft computed (as multiplication in frequency domain is what we want).
- 5) finally take ifft to get signal in time domain.

After this, I tried adding a median filter before low pass filter, gave slightly better results.