

Lab7 report

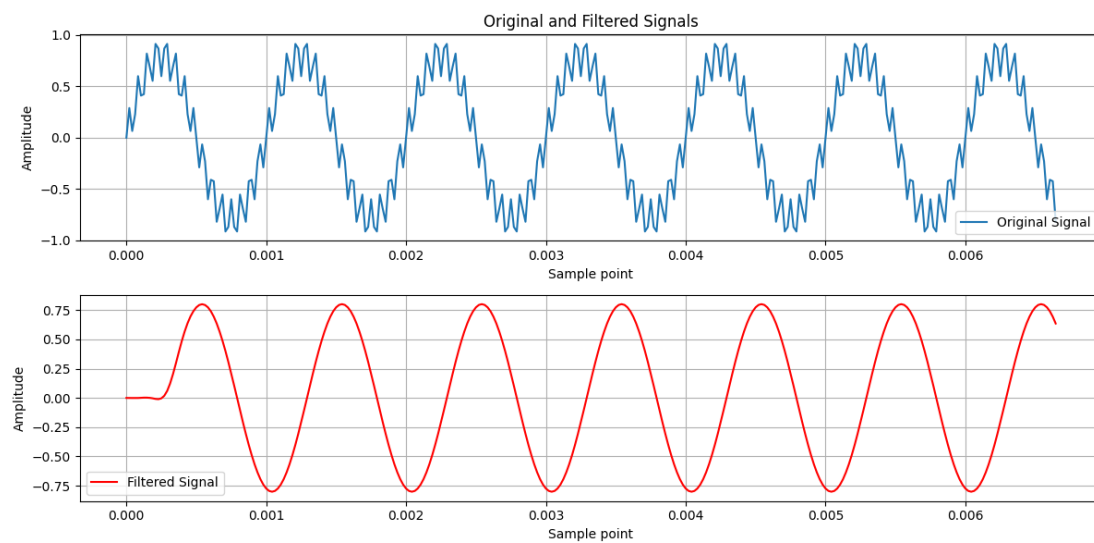
B09901055 楊健綺

Code: <https://github.com/stanthemaker/EmbeddedSystem/tree/main/hw7>

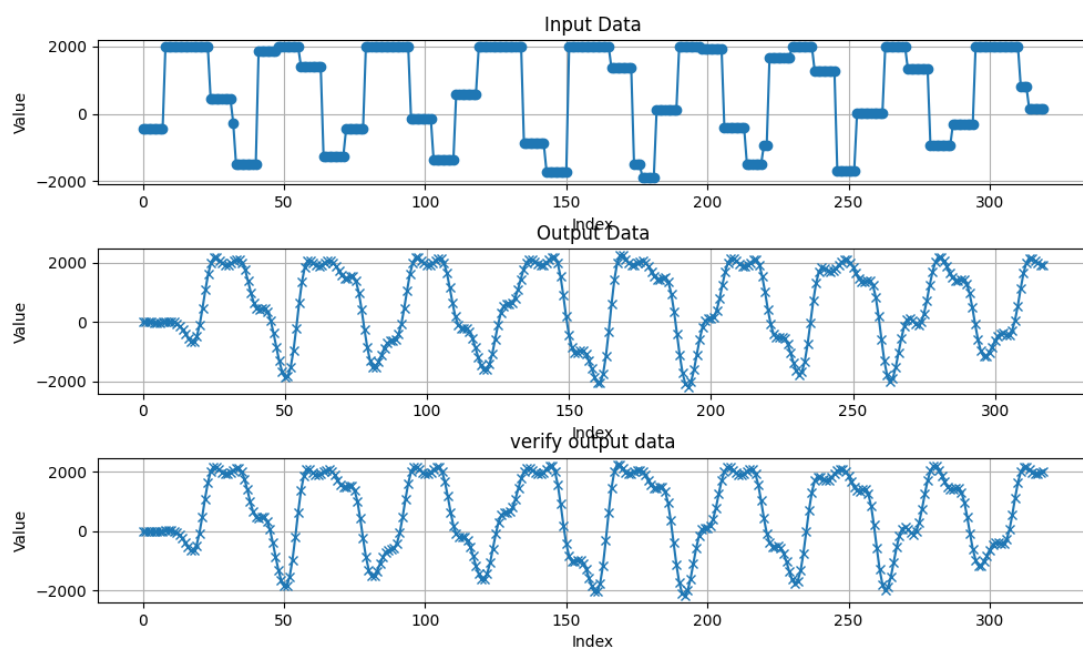
Approach:

1. Use the Mbed studio write a FIR code . First gather data from the onboard accelerometer sensor. Then transfer the data to an array and apply FIR filter on it.
2. Compare the wave form generated with the python code output.

Experimental Data:



Real-Time Data:

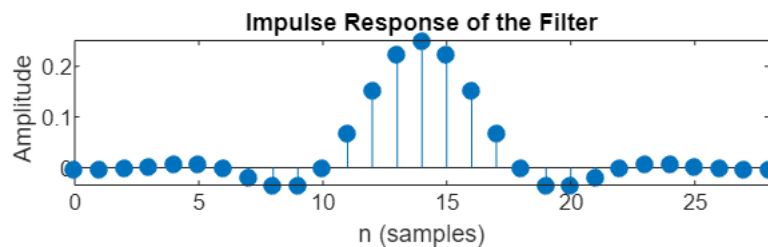


Discussion:

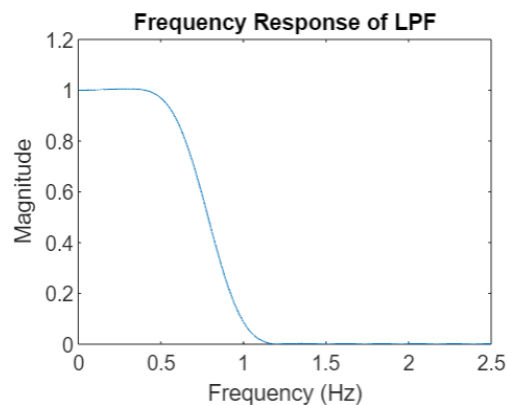
FIR(Finite Impulse Response) low pass filter

The term "finite impulse response" refers to the fact that the filter's output is determined by a finite number of previous inputs. The impulse response is finite in length, as opposed to an infinite impulse response (IIR) filter, where the impulse response continues indefinitely.

In order to understand FIR lowpass filter, we reproduce the filter and its impulse response and frequency domain diagram.



The impulse response is finite in length, as opposed to an infinite impulse response (IIR) filter, where the impulse response continues indefinitely.



The FIR have easier design that has no feed back loop. Also, it provides more stability with linear phase response, which means that all frequencies within the passband experience the same delay.

In this experiment, we observed that the vertical edge of the input signal have become smoother in the output, representing that the high frequency parts have been eliminated.