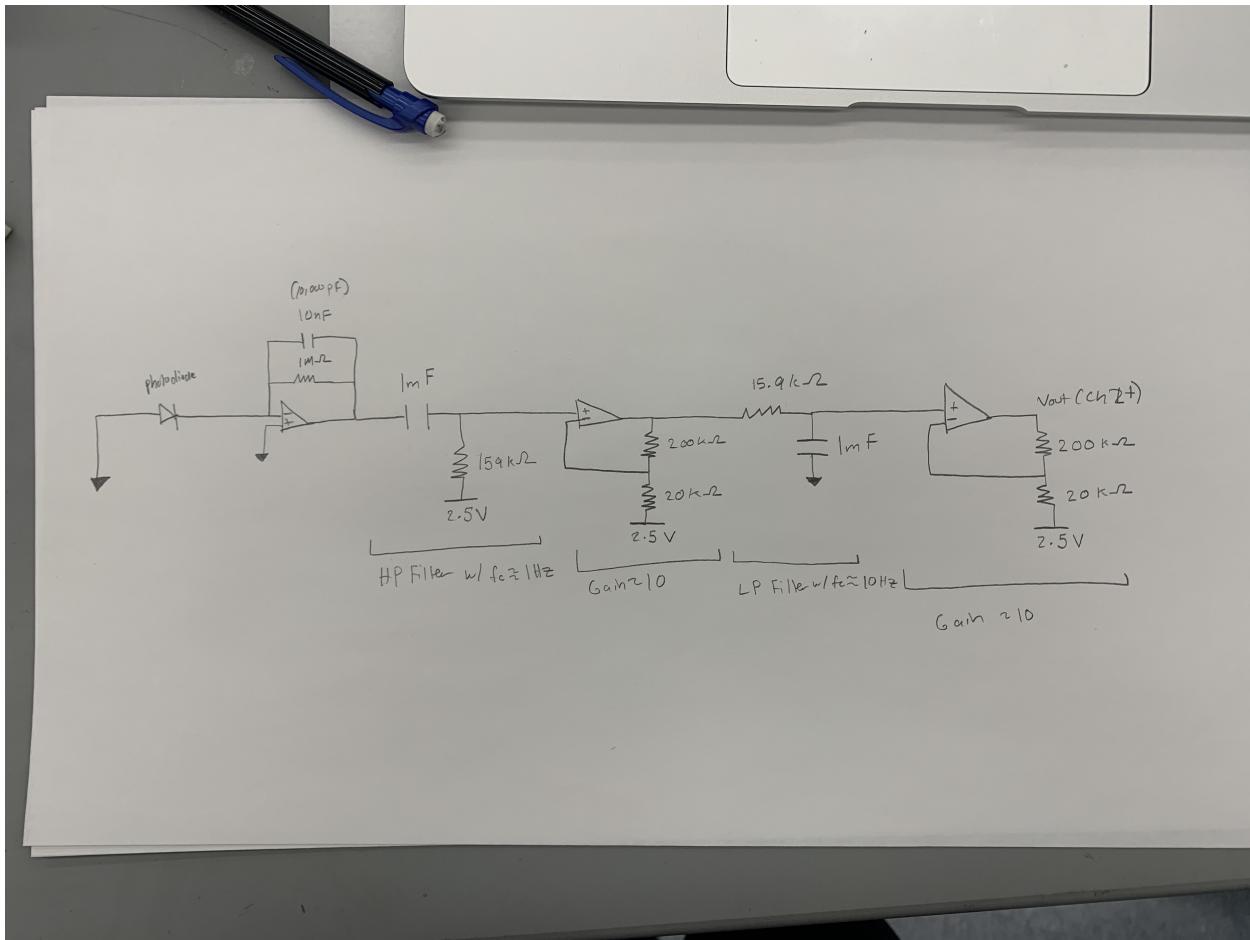
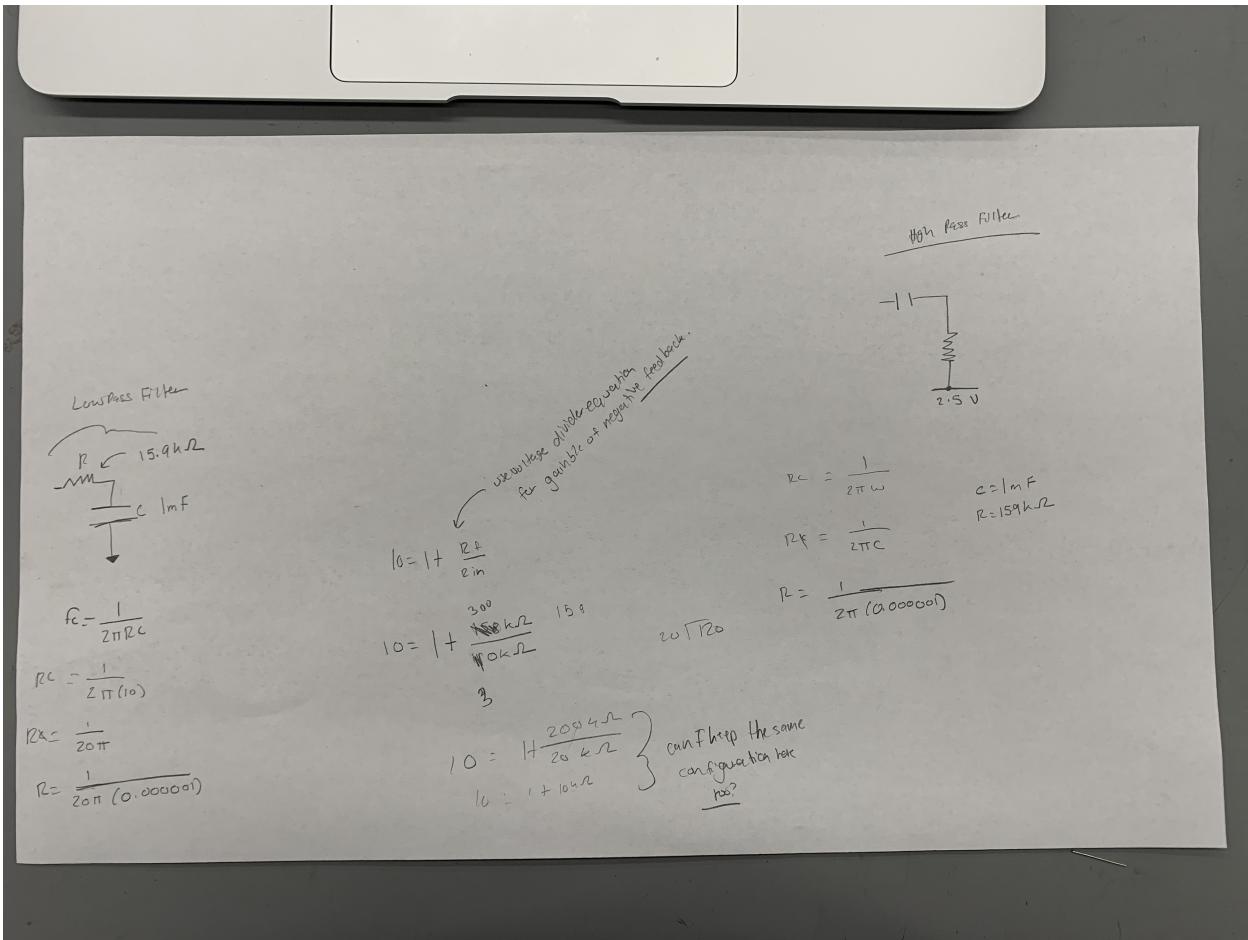


Lab 7

Schematic of circuit



Logic of choosing R and C values



I chose my R and C values based on the cutoff frequency formula. The logic for using this formula is to have the cutoff frequency approximately equal the resistor and capacitor values used to confirm that the frequency the electrical engineer intends to cutoff is actually cutoff.

I rearranged R and C to get $1/2\pi RC$ and plugged in a capacitance value and moved R to one side to solve for R. I used the cutoff frequency of 1 Hz for the high pass filter because this is about a human heart rate so I'd filter for any frequencies higher than this and there's similar logic for my low pass filter. I set the Hz value to 10 to only see frequencies that were 600 beats per minute or lower (although this is absurdly high of a Hz value). The values I ended up choosing were $158\text{ k}\Omega$ for the high pass filter and $15.8\text{ k}\Omega$ for the low pass filter. My

I chose the gain values based on the voltage divider and gain equation. I set gain equal to 10 and solved for R_f and R_{in} . I kept the same gain value for both op-amps.

To summarize: **Gain value is 10 for both op-amps. Cutoff frequency values are 1 Hz for the high pass filter and 10 Hz for the low pass filter. I chose the values by using the formulas learned in Lab 6 and forward to isolate one value (the resistor value in filters and gain in gain) to build the circuit.**

Bode Plot of entire circuit performance

Axis are Frequency (Hz) on x-axis and Amplitude on y-axis.

