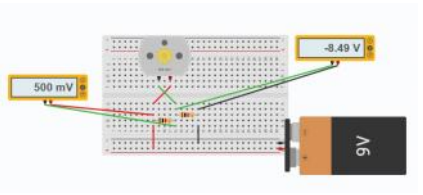
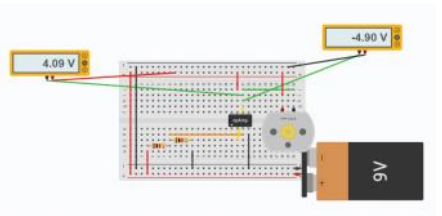
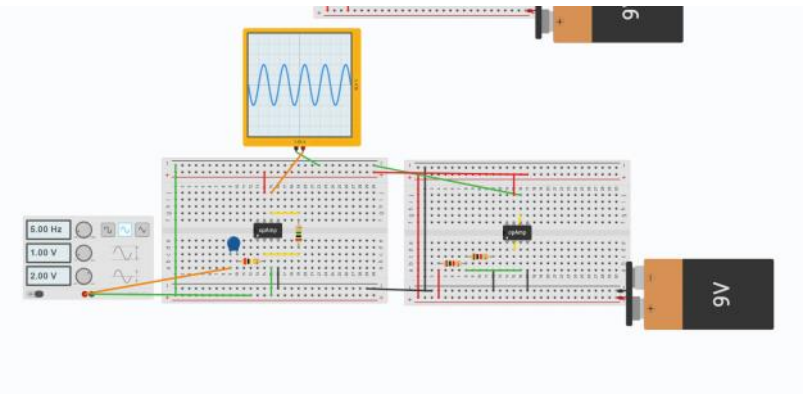
Week 7: More Circuits Lab

Monday, October 10, 2022 10:57 AM

No OP AMP DC Motor: Voltage Drop: 500mV, 999RPM
OP AMP DC Motor: Voltage Drop 4.09V, 8174RPM







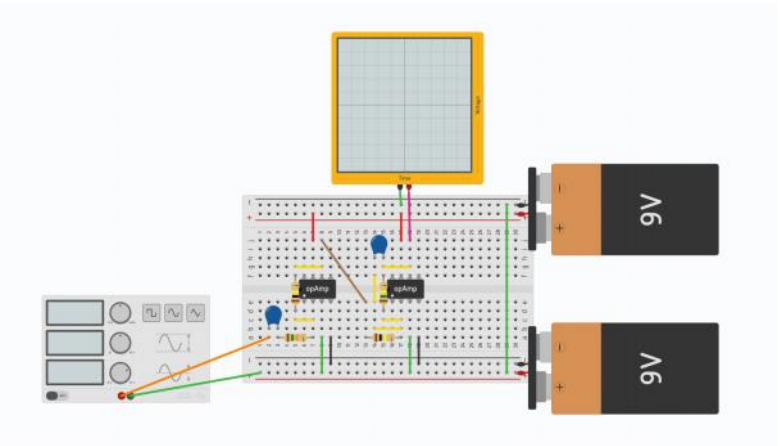
High pass filter design

Report measured values of resistors and capacitors, not "labeled" values

- Resistor on input: 14.6 kΩ
- Feedback resistor: 99.7 kΩ
- Capacitor: 2.17 µF

Calculations using measured values

- Gain: 16.7 dB
- Cutoff frequency: 5.02 Hz



Low pass filter design

Report measured values of resistors and capacitors, not "labeled" values.

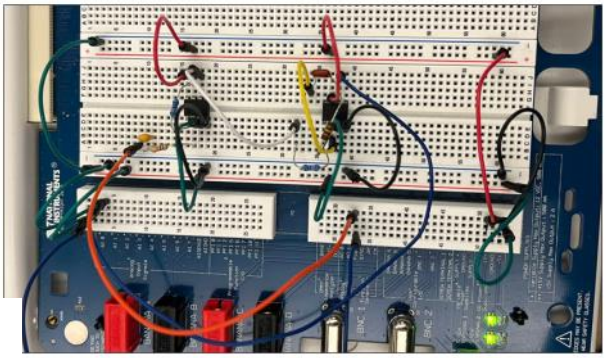
- Resistor on input: 100 kΩ
- Feedback resistor: 144 kΩ
- Capacitor: 22.2 nF

Calculations using measured values

- Gain: 3.17 dB
- Cutoff frequency: 49.8 Hz

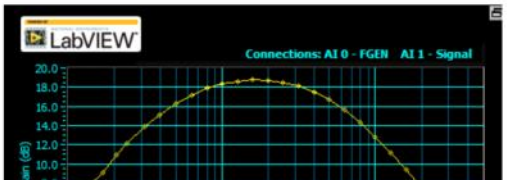
Circuit

- Calculated overall gain: 19.9 dB



Bode plot (gain vs frequency only)

- Approximate maximum gain according to Bode plot: 18.8 dB
- Approximate band and pass range according to Bode plot: 5.03 Hz to 50.1 Hz



Bode plot (gain vs frequency only)

- Approximate maximum gain according to Bode plot: 18.8 dB
- Approximate band and pass range according to Bode plot: 5.03 Hz to 50.1 Hz

Week 8: EKG Project

Objectives:

1. Construct a working instrumentation amplifier circuit on your solderless breadboard to measure your ECG signal
   - You will use 2 batteries for this, so you don't have to worry about building a voltage follower
   - Measure your ECG using the ELVIS boards and the ELVIS tool "Dynamic Signal Analyzer"
   - No filtering is needed yet, just the instrumentation amp part
2. Design the voltage follower and instrumentation amp part of the ECG in Fusion 360 - just get the schematic done
3. Prepare for week 9 and do the presentation work.