Practice 1

Design a circuit that attenuates (i.e., gain < 1) frequencies below 400Hz.

You have 47nF, 470nF, 4.7μF, and 220μF capacitors, a 1mH inductor, and an assortment of resistors from 50Ω to 1MΩ.
This is a high-pass filter (preserve > 400Hz)

Don't need amplification, so passive filter is ok

Pick a value for C, and then solve for R to make the corner frequency = 400Hz.
Speakers

Convert changing voltage to sound using an electromagnet
Practice 2

Design a circuit has a **gain of 5** for frequencies **below 400Hz**, and attenuates others.
This has gain, so we need an op-amp

At high frequencies, the gain should go to 0.
Even with a well-built amplifier circuit, we may still pick up some **60Hz noise**. Figure out a way to **remove it in software**.

**Challenge**: what does your solution do with other frequencies? Consider 58Hz, 30Hz, 120Hz, 1Hz.