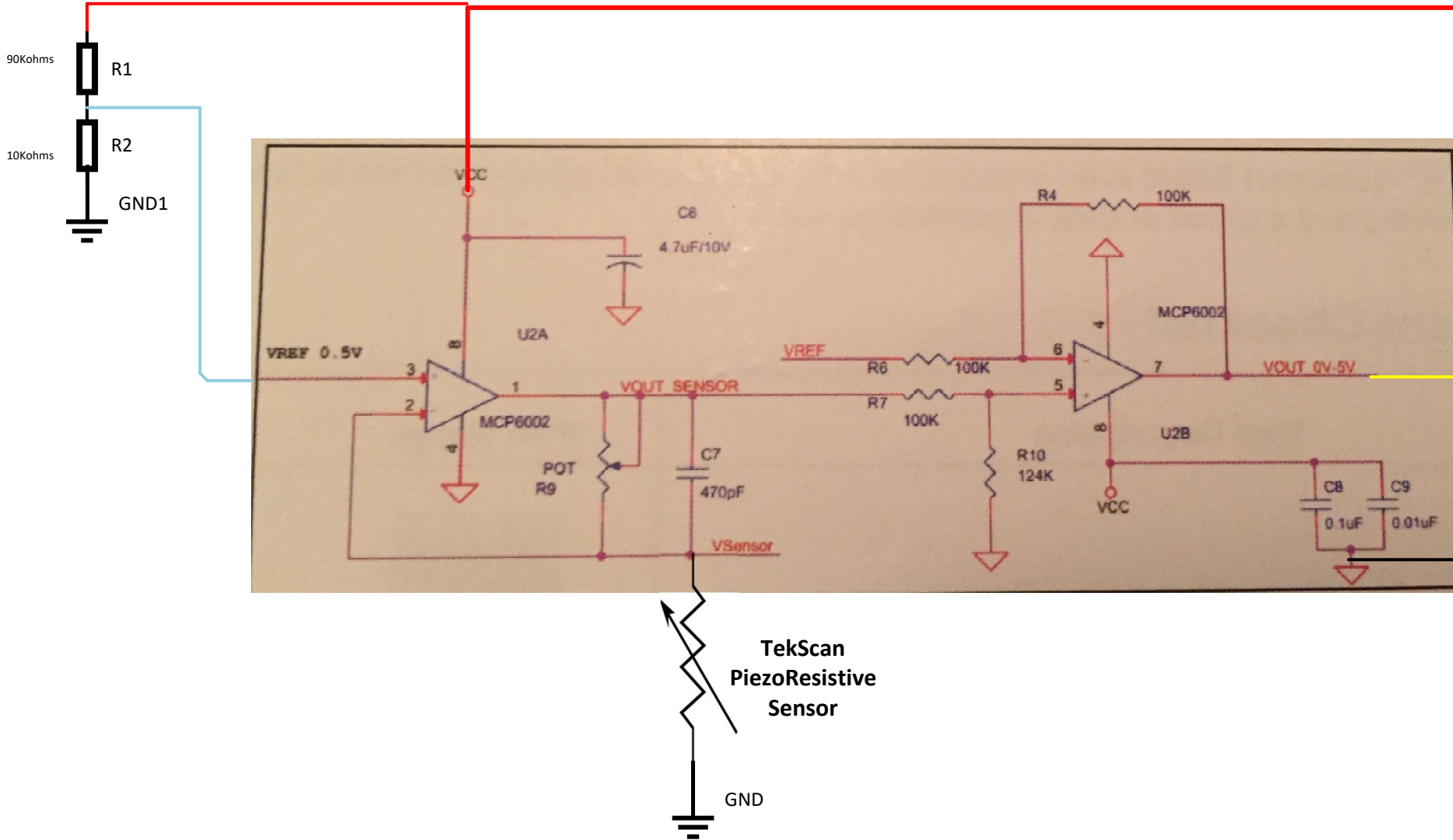


Wiring Diagram

Buzzer was used to provide Audible Feedback to the user when the weight for the rep was completely lifted. The input relies on the Accelerometer data in the Curie to accurately measure if the weight was lifted properly.

5V Supply



AIN0

5V Supply

LCD Screen was used to inform the user how many reps has he performed for the given set.

SCL
SDA

Buzzer Input

+9V GND

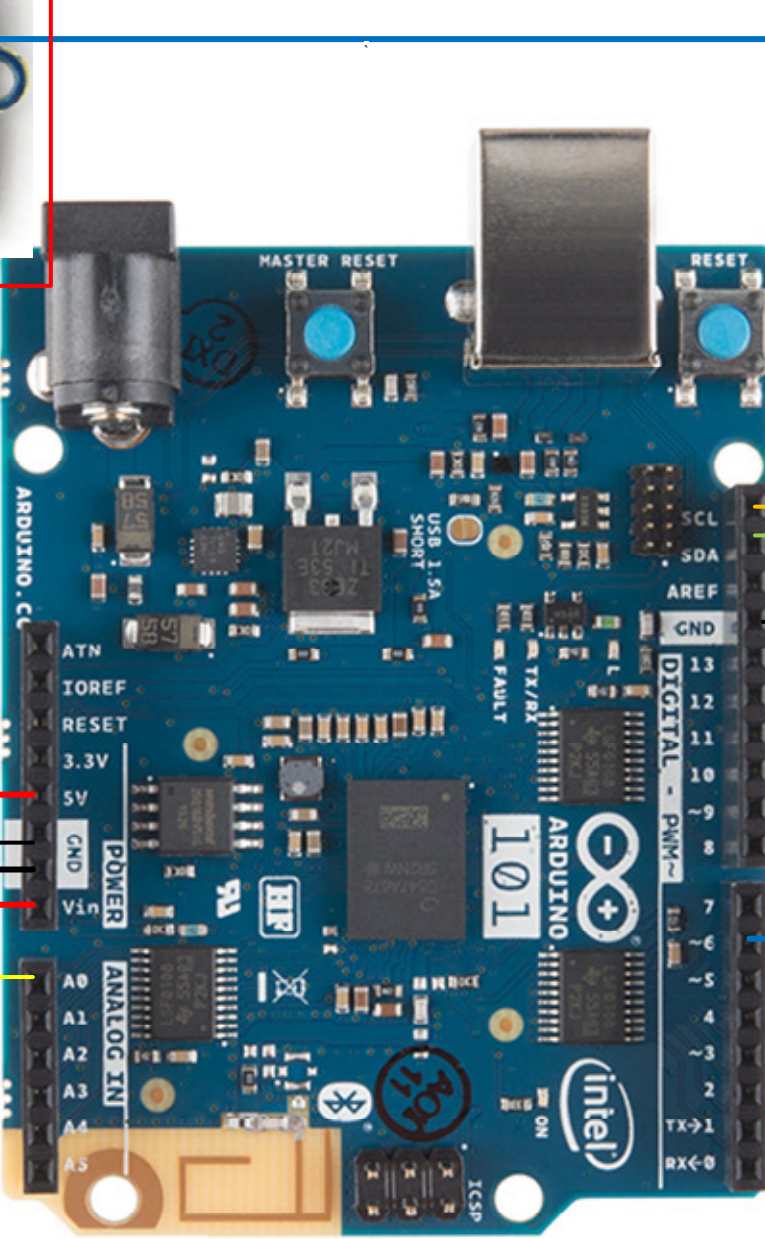
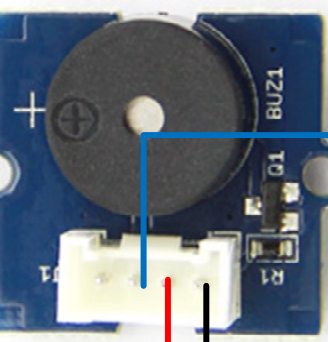
Amplifier circuit is powered by +5V from Arduino 101 regulator. The 0.5V voltage reference is generated using the resistive divider circuitry. The Resistive divider is fed to non inverting terminal of U2A. The inverting terminal is connected to the weight sensors, who resistance changes depending on the load applied.

When no load is present, the weight sensor acts as open circuit. Thus VOUT_SENSOR trace is close to 0V. R9 is a POT and is used to calibrate the weight required to be measured. The POT was calibrated to measure weights from 0lbs to 100lbs.

The output of U2A can be calculated = $1 + R_POT / R_SENSOR$.

The second stage of OpAmp, U2B is a differential amplifier. It is designed to subtract the 0.5V DC voltage used in the first stage.

For 5lbs weight, output voltage is 160 mV
For 10lbs weight, output voltage is 320 mV
For 20lbs weight, output voltage is 640 mV
Maximum weight measured (3.3V ADC limitation) = 103.13 lbs.



Arduino 101 was powered using the 9V battery. We plan on using a Lithium Ion battery (4.2V nominal), optional battery charger in Curie and Boost Converter to boost the voltage to 5V rail for the final product.