Design Challenge 3

Team 45

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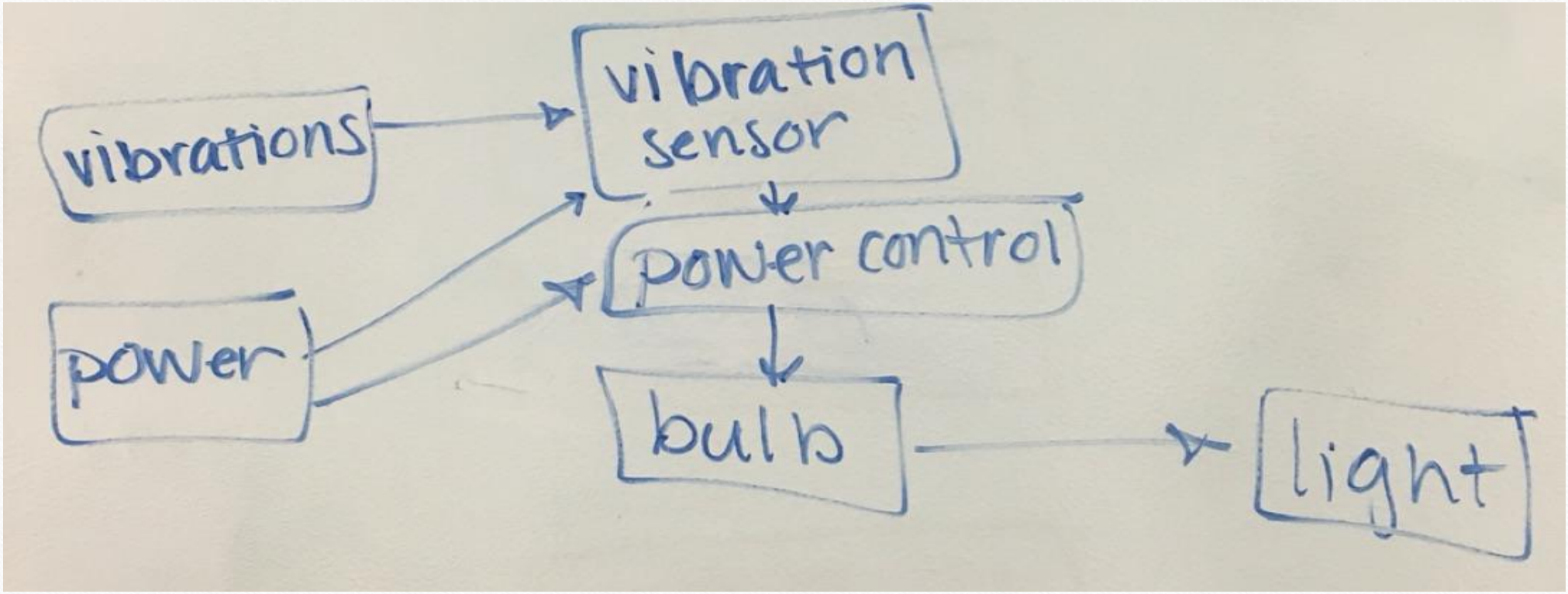
Device Function

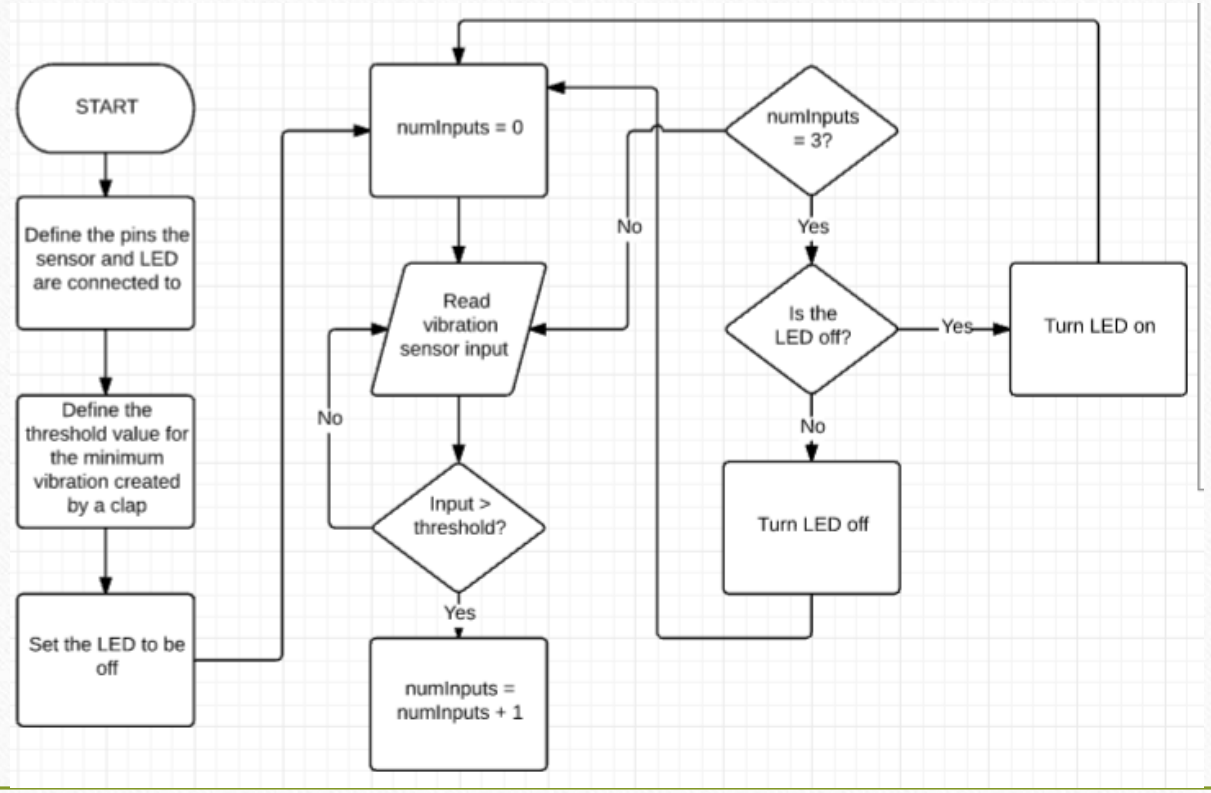
- "Clapper" light switch
- Vibration sensor detects vibrations due to clapping and turns on or off and LED light depending on its current state.
- Arduino reads in input values from vibration sensor.
  - If above a certain threshold, and if three acceptable inputs in a row, Arduino changes current state of LED

Customer Need	Technical Need	Technical Requirement	Target Value
Turns on/off after 3 claps	Times out of 10 claps are detected correctly	9/10 trials work correctly	10/10 trials work correctly
Sense a variety of clap vibrations	Vibration Intensity detected	Above the threshold of 30	Above the threshold of 30

System Diagram



Conceptual Logic Flowchart



Prototype Circuit Design

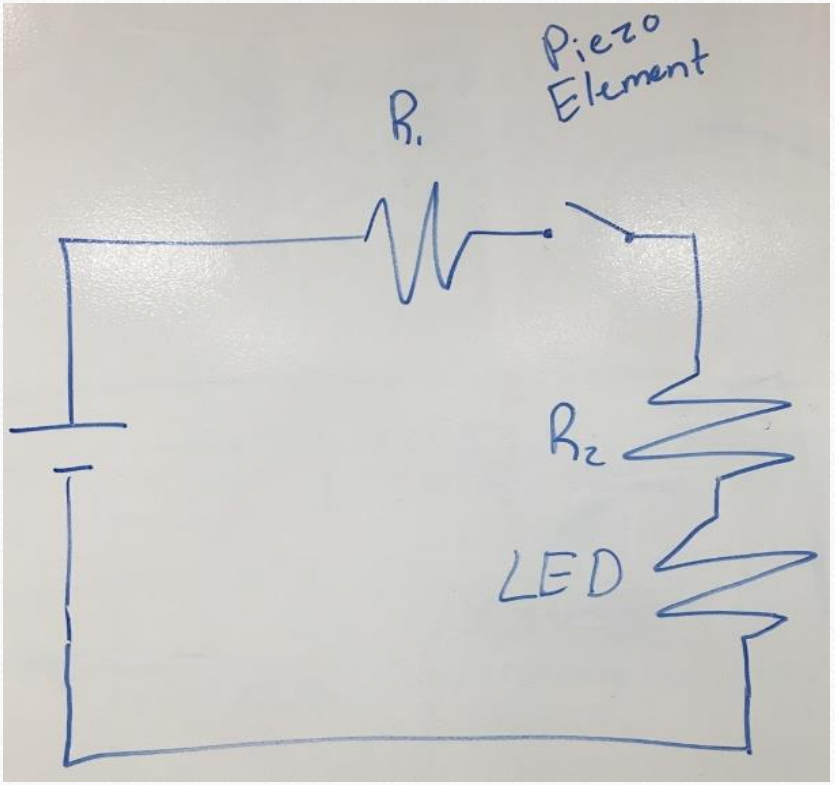
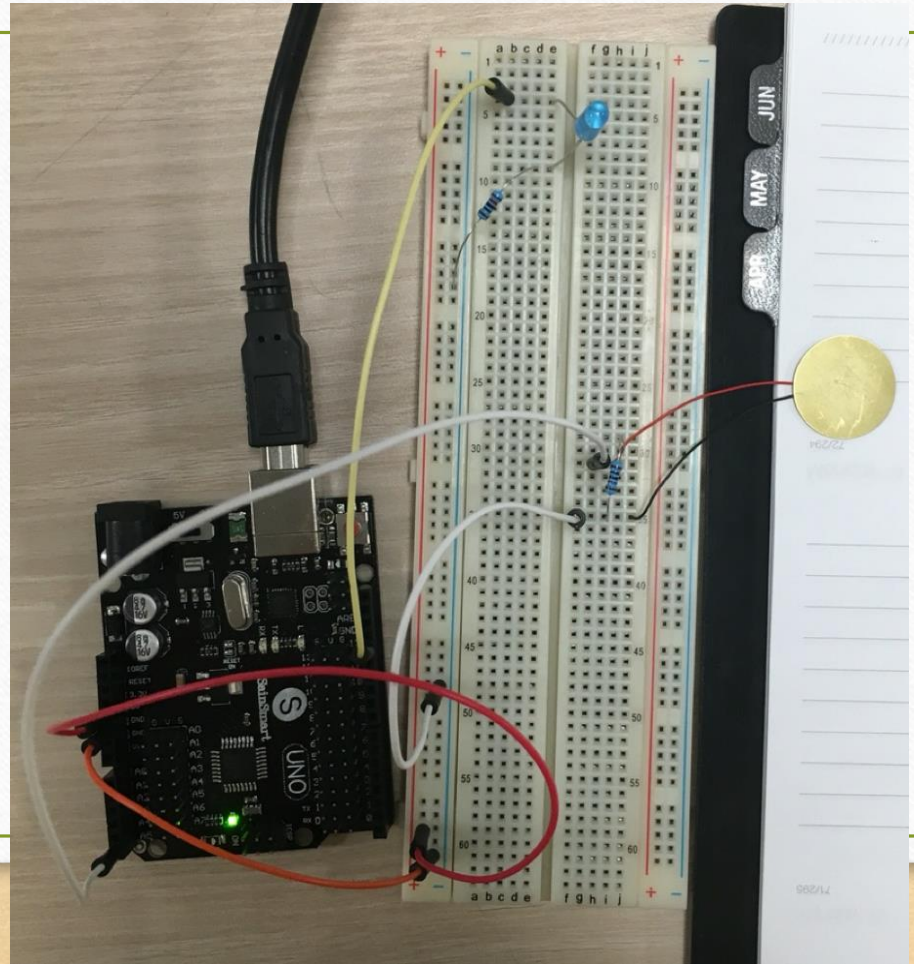


Image of Circuit



Test Results

TESTING ROUND	THRESHOLD VALUE	OBSERVATIONS
1	100	LED only turned on if breadboard itself is knocked. Not sensitive to vibrations close to breadboard
2	50	LED turned on when the vibration sensor is lightly tapped, but still not sensitive enough to detect clapping vibrations
3	5	LED turned on after only two taps. Too sensitive to knocks.
4	30	LED turned on much more consistently. Does not detect claps, as originally planned, but works consistently with knocks or taps to the vibration sensor

Discussion

- Future steps to work with claps rather than taps/knocks:
  - Set very low threshold and a maximum threshold to prevent very non-clapping vibrations from causing errors to the system (i.e. door slams, bumps)
- Other ideas for this design:
  - Increase the amount of light for every tap detected
  - Use multiple LED lights
  - Use this to control the amount of light coming from the flashlight/nightlight/room/etc. depending on the amount of claps/taps detected

Thank You

Questions?