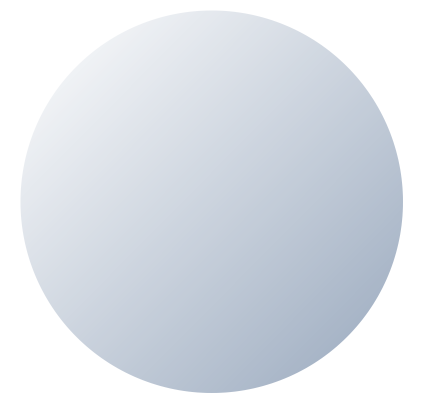
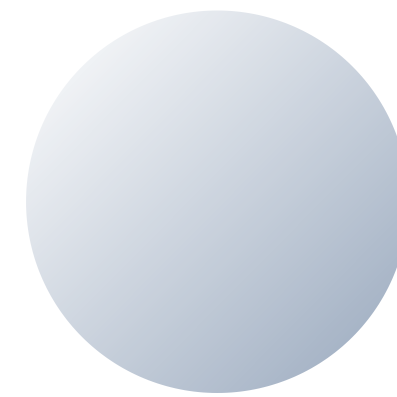


Introduction

This project demonstrates a clap-activated switch that turns on an LED using sound input. It uses an LM393 sound sensor module to detect the sound of a clap and send a signal to a 555 timer IC. When triggered, the timer switches the LED on indefinitely.

The LED remains lit until a push button is pressed, providing a simple manual way to turn it off. The circuit is powered by a 9V battery and includes essential components like resistors for proper operation.

This project is ideal to understand basic concepts of sound detection, timing circuits, and simple automation using electronic components.

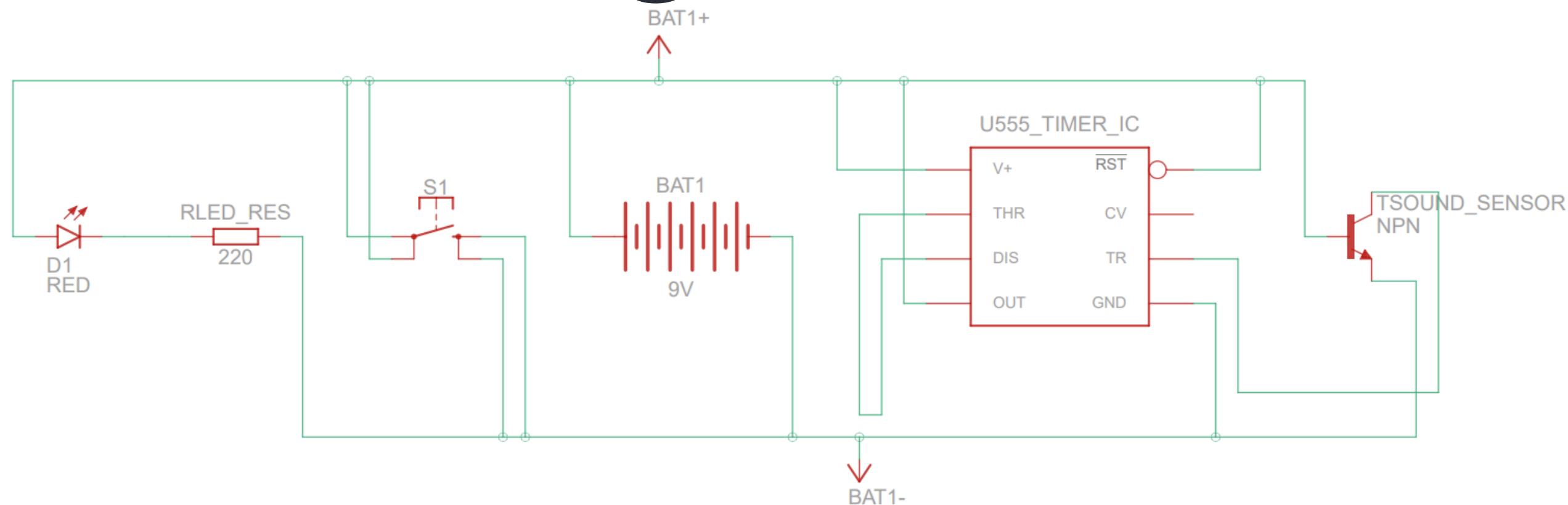


Hardware Components

Hardware components used in the circuit:

1. LM393 Sound sensor module
2. 555 timer ic
3. LED
4. Push Button
5. Resistors (220 ohm, 1 k ohm)
6. 9 V battery

Circuit Diagram:

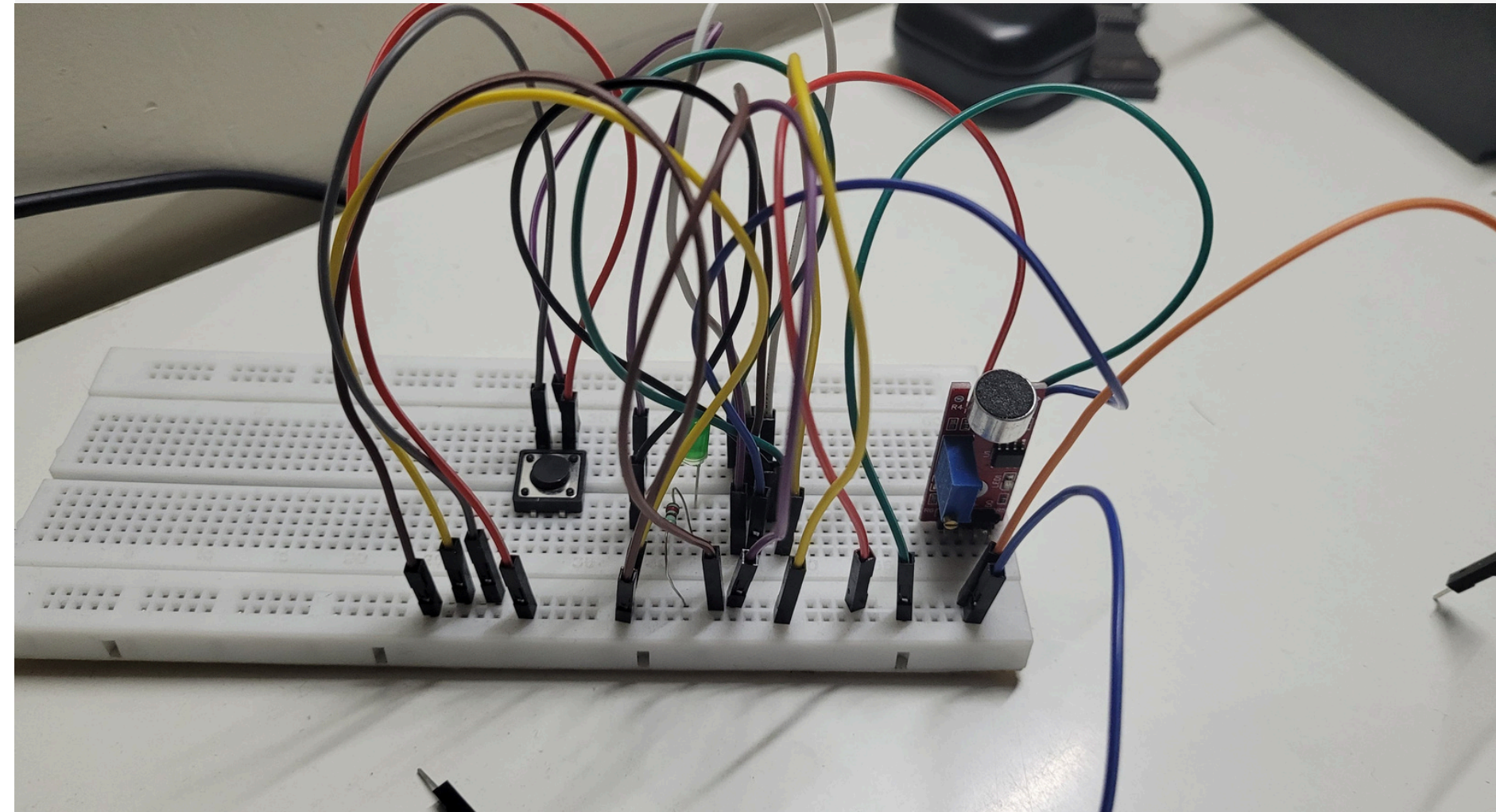


The above circuit diagram connection explanation:

1. LED is connected to GND via 220 ohm resistor and its anode is connected to the 3 pin (OUTPUT) of 555 timer ic.
2. Push Button(S1) is connected to GND and other pin is connected to Vcc and anode of LED.
3. 555 timer ic's pin 1(GND) is connected to GND, pin 2(Trigger) connected to LM393 D0 pin(digital output pin). pin 3(OUT) is connected to LED, pin 8(Vcc) and pin 4(reset) connected to each other, pin 7(discharge) and pin 6(threshold) connected to each other.
4. LM393 pin D0 connected to pin 2 of 555 timer ic, pin + connected to Vcc and pin G connected to GND.

Working of Circuit:

- The clap circuit works by giving a high decibel input (by clapping) to the LM393 sound sensor which can detect this audio signal and convert it into digital signals.
- When a clap is detected LM393 gives a low digital signal to 555 timer ic via pin 2, which triggers the ic to start its timer cycle.
- 555 timer ic is connected in monostable state which means it will keep the circuit in high state as long as its timer is running.
- this high signal is then given to LED using pin 3 of 555 ic which turns the LED on till the 555 timer ic is working.
- to stop the 555 timer ic's timer cycle a push button is used to reset the circuit by temporarily shutting the power supply.



Results:

- The given circuit can successfully detect audio inputs from user.
- The proposed system can successfully turn on a LED by detection of a clap.
- The system can reset using a push button, therefore allowing user to switch off LED when needed.
- The system is cost-effective and easy to install in a real-life scenario, but will require relay, voltage divider, AC-DC adapter, rectifier, etc.

Conclusion:

- The proposed system can be improved by adding required components to be able to connect to the main power supply.
- Real-life application is possible.
- Cost-effectiveness, easy to use and time efficient are its major positives.
- Overall the system is designed to give ease of use factor to the user.

