PROJECT 2

Turning ON and OFF by Clapping.

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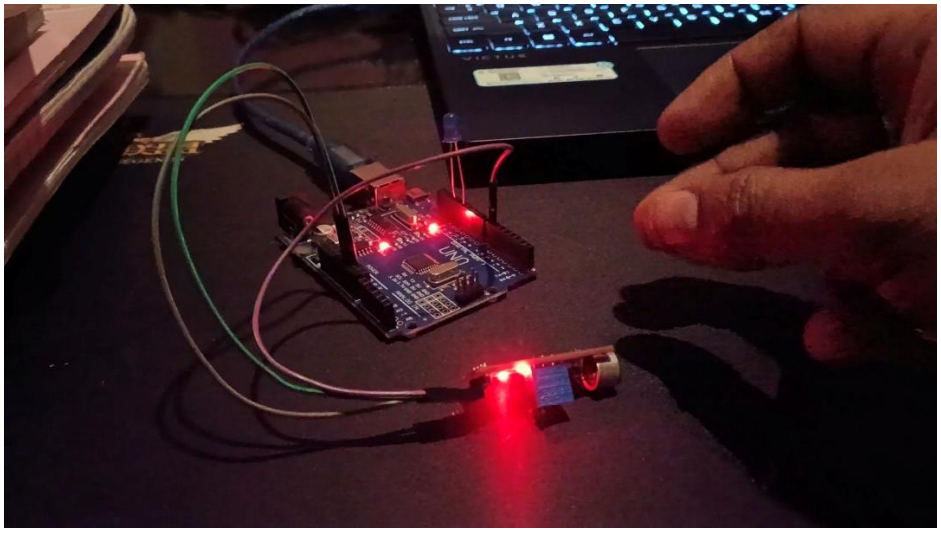
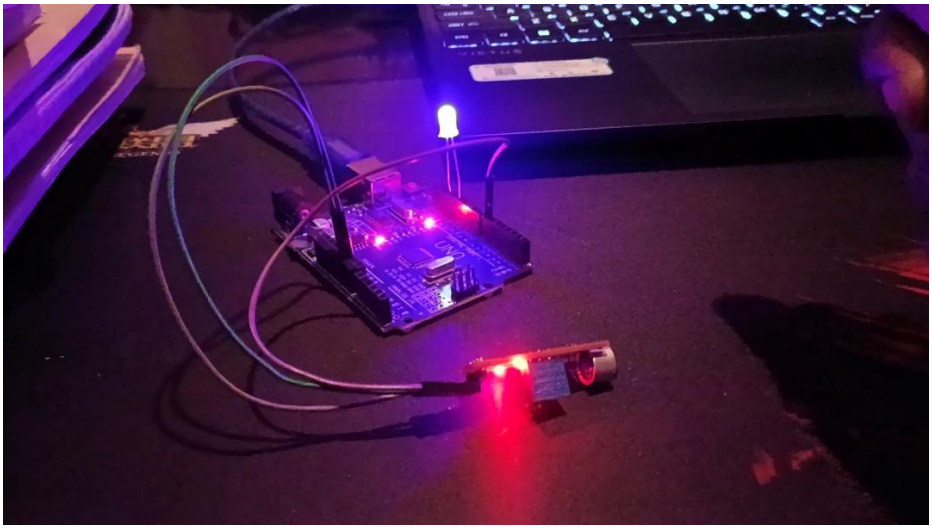
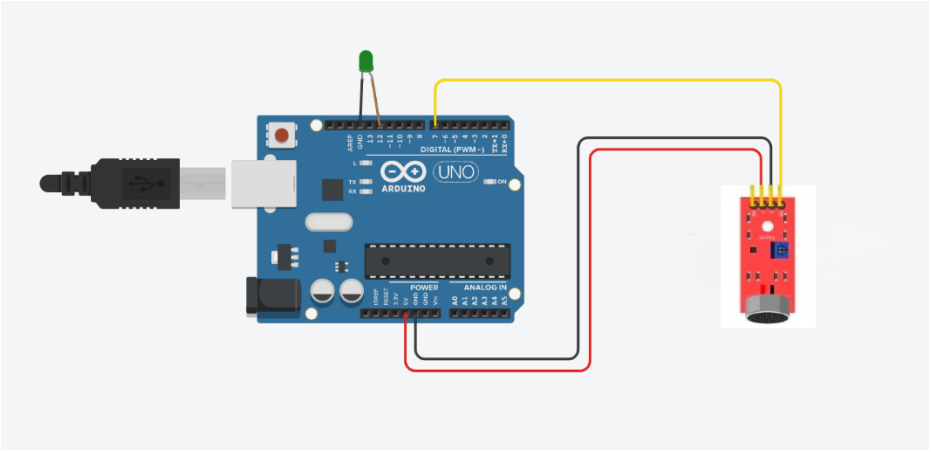
G11 ES & IOT





Real Time Project Pictures



Circuit Diagram

Components Used:

- Arduino UNO R3
- LED
- Sound Sensor (HW-484)
- Wires
- Breadboard (optional)

Program:

```
// Program for Switching ON and OFF LED using a clap switch...
const int soundSensorPin = 7;              // Pin connected to the sound sensor output
const int ledPin = 12;                     // Pin connected to the LED

// Variables for tracking clap detection
bool ledState = LOW;
unsigned long lastClapTime = 0;           // Time of the last clap

void setup()
{
  pinMode(soundSensorPin, INPUT); // Set sound sensor pin as input
  pinMode(ledPin, OUTPUT);        // Set LED pin as output
  Serial.begin(9600);
}

void loop() {
  int sensorValue = digitalRead(soundSensorPin);       //  T0 read the sound sensor

  if (sensorValue == HIGH)
  {
    unsigned long currentTime = millis();

    ledState = !ledState;                              // Toggle the LED state
    digitalWrite(ledPin, ledState);                    // Update the LED
    lastClapTime = currentTime;                        // Update last clap time
    Serial.println("Clap detected!");                  // Printing to Serial Monitor

  }
}

```

Applications Of this Clap Switch:

1. Home Automation

- **Application**: A clap switch can be used to control household lights, fans, or other appliances, providing a hands-free way to operate them.
- **Benefits**: Convenient, especially for people with mobility challenges, and energy-efficient since devices can be turned off without needing to reach for switches.

2. Assistive Technology for People with Disabilities

- **Application**: Clap switches allow people with limited mobility to control devices by clapping, which is easier than using standard switches or remote controls.
- **Benefits**: Enhances independence for people with disabilities, allowing them to control lights or fans without assistance.

3. Smart Lighting Systems

- **Application**: Clap switches can be integrated into smart lighting systems to turn lights on or off with a clap or series of claps. This is particularly useful in bedrooms, living rooms, or workspaces.
- **Benefits**: Adds a layer of convenience for users, and can save energy by making it easier to turn lights off when leaving a room.

4. Home Security Systems

- **Application**: Clap switches can trigger security systems or alarms. For instance, a clap-activated alarm could be set up as an emergency alert in situations where the user cannot reach the main alarm switch.
- **Benefits**: Adds a hands-free activation option, allowing users to trigger an alert in case of an emergency.

5. Child-Friendly Controls

- **Application**: Clap switches can be used in toys or child-safe lamps, allowing children to turn them on or off with a clap. It can be fun and practical, especially for nightlights or toys that are hard for children to switch on.
- **Benefits**: Makes certain devices more accessible and engaging for children.

6. Garage and Outdoor Lighting

- **Application**: A clap switch can control outdoor or garage lights, allowing users to activate them without searching for a switch, especially useful if hands are occupied or in the dark.
- **Benefits**: Improves convenience and safety, allowing quick activation of lights when needed.

7. Clap-Controlled Decorative Lighting

- **Application**: Used in decorative lighting setups, such as Christmas lights or LED strips, a clap switch can turn them on or off for festive lighting control without needing to manually operate switches.
- **Benefits**: Adds novelty to lighting control and can be particularly useful for temporary or seasonal decor.