Prototype of a Street Light System Using a Piezoelectric Sensor

Submitted by

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INTRODUCTION –

A **piezoelectric sensor** is a device that uses the piezoelectric effect to measure changes in pressure, acceleration, temperature, strain, or force by converting them to an electrical charge. The prefix *piezo-* is Greek for 'press' or 'squeeze'.

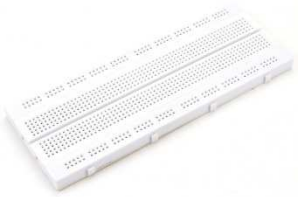
A sensor which works on the principle of **piezoelectricity** is known as a piezoelectric sensor. Where piezoelectricity is a phenomenon where electricity is generated if mechanical stress is applied to a material. Not all materials have piezoelectric characteristics.

OBJECTIVE -

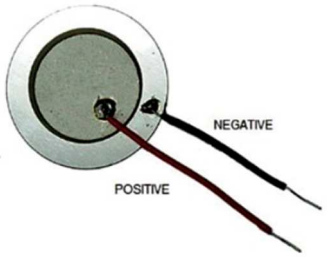
- The main aim is to make the prototype of a street light system using Piezoelectric Sensor.
- Also, to study about Piezoelectric Sensor.
- And to apply the knowledge of iot studied.
- And also, the objective is to save energy.

COMPONENTS REQUIRED -

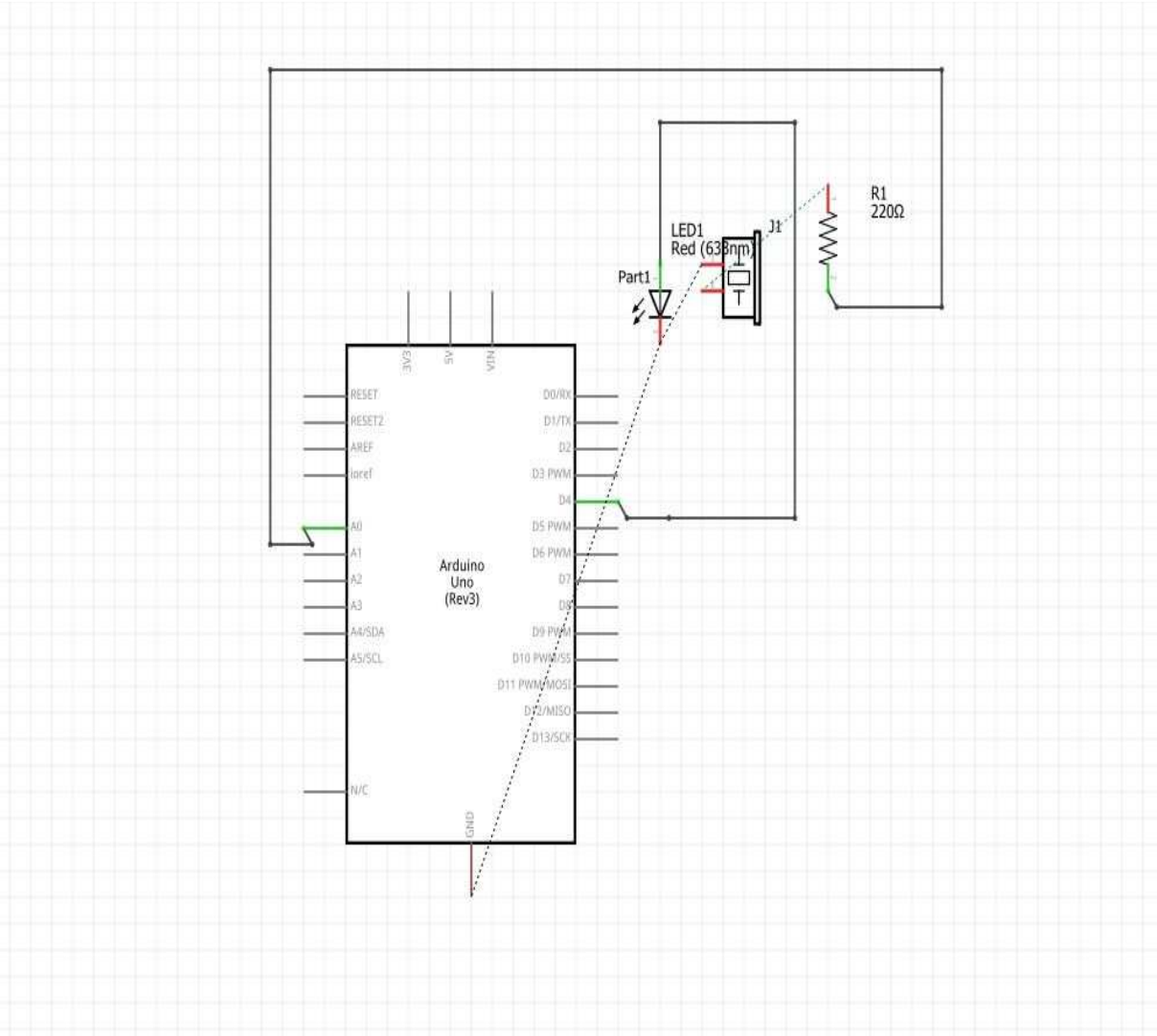
- Piezoelectric Sensor
- Arduino
- LED
- 1M Resistor
- Jumper
- Breadboard

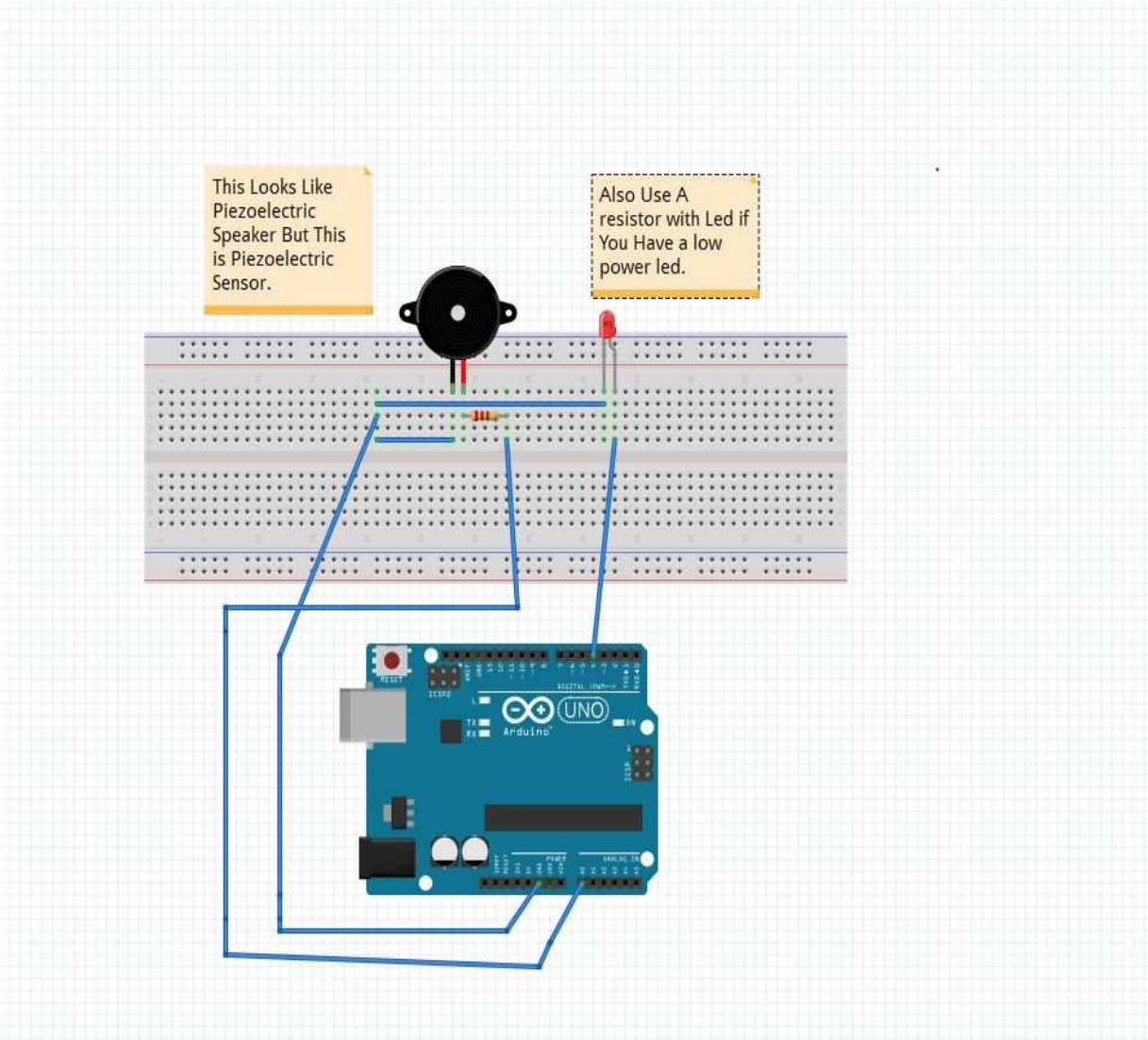



UNO
ARDUINO

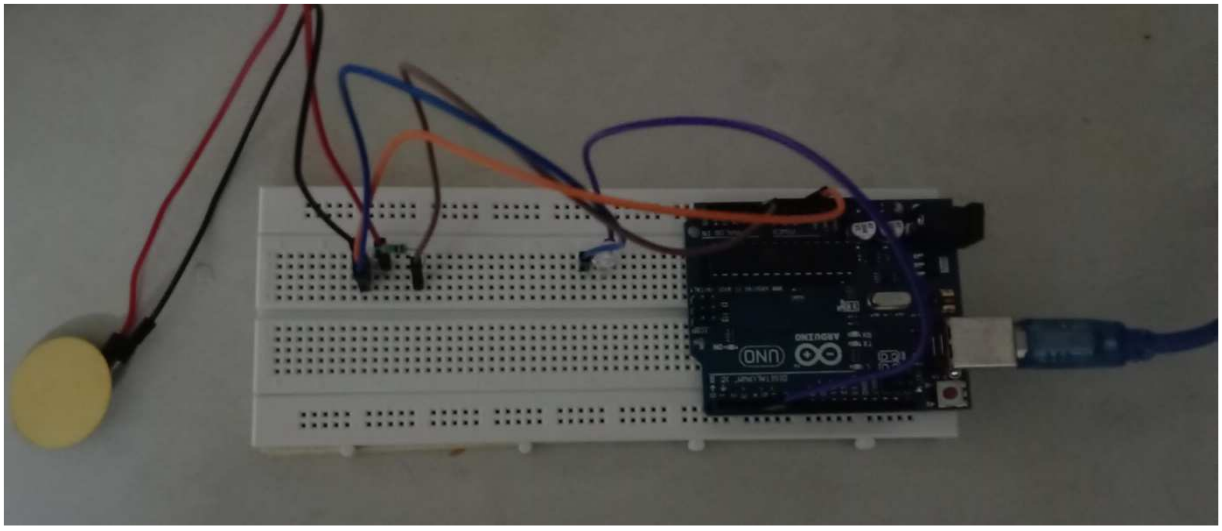

NEGATIVE
POSITIVE

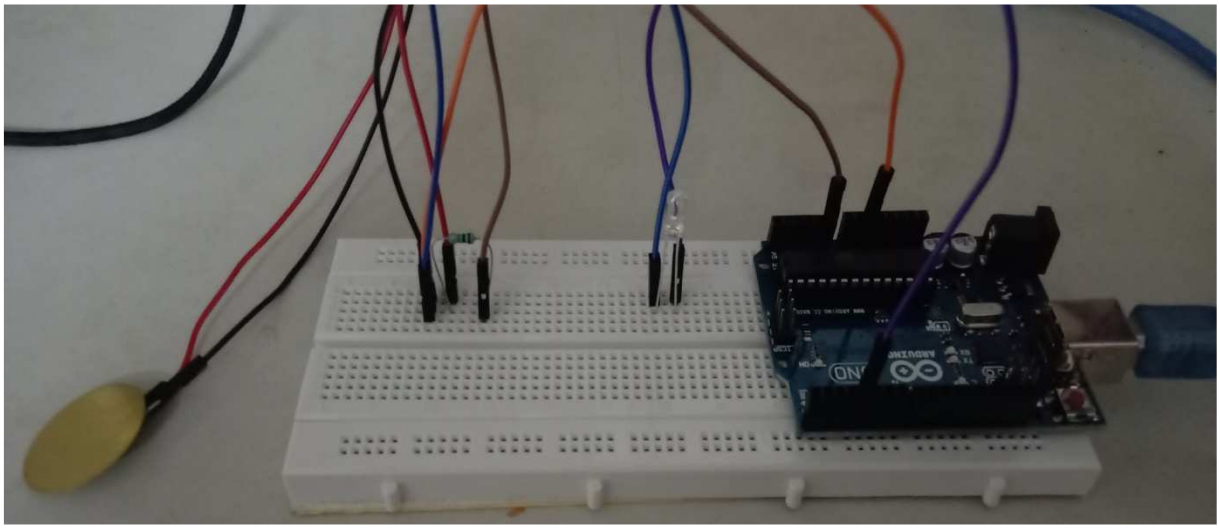
CIRCUIT DIAGRAM –

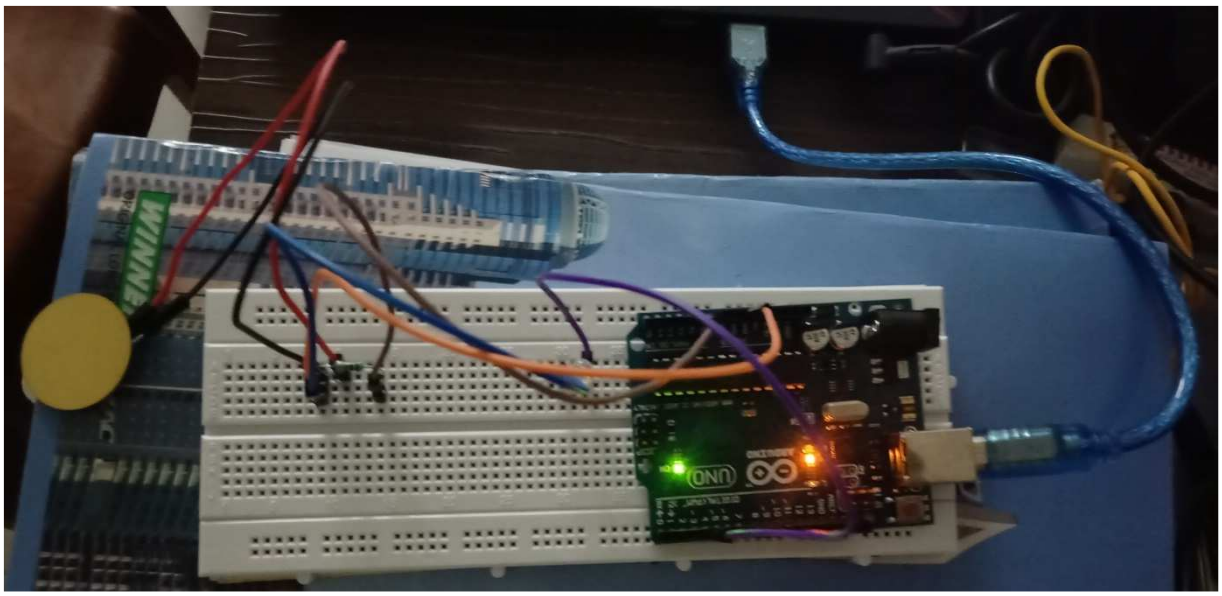


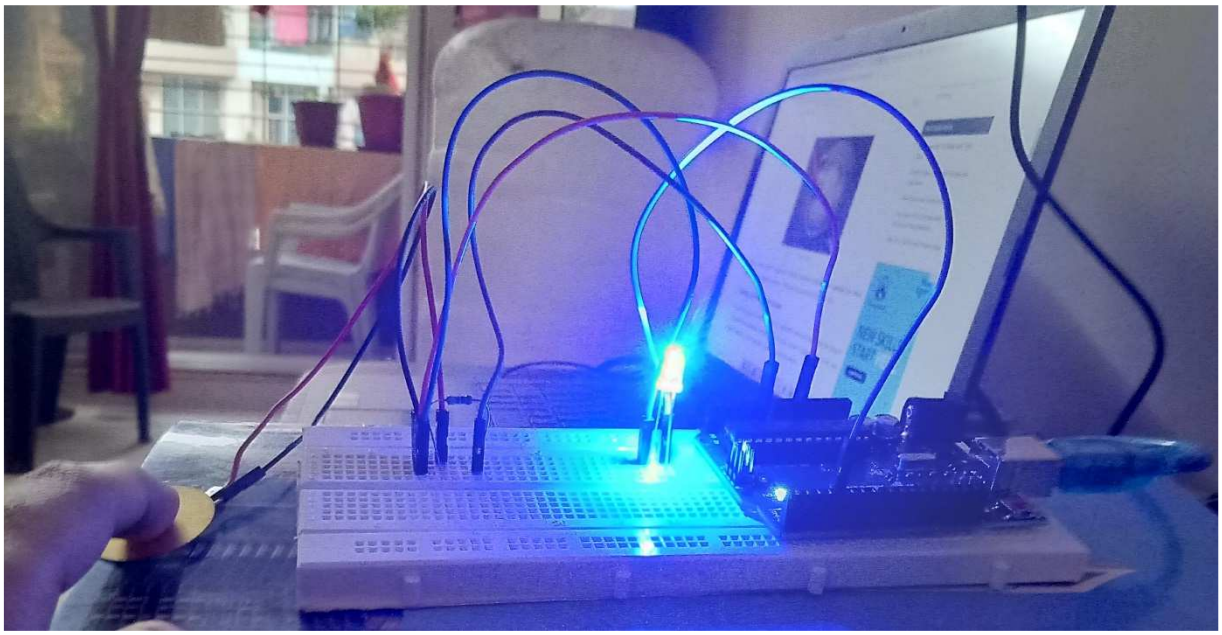

This Looks Like Piezoelectric Speaker But This is Piezoelectric Sensor.
Also Use A resistor with Led if You Have a low power led.
UNO
Arduino

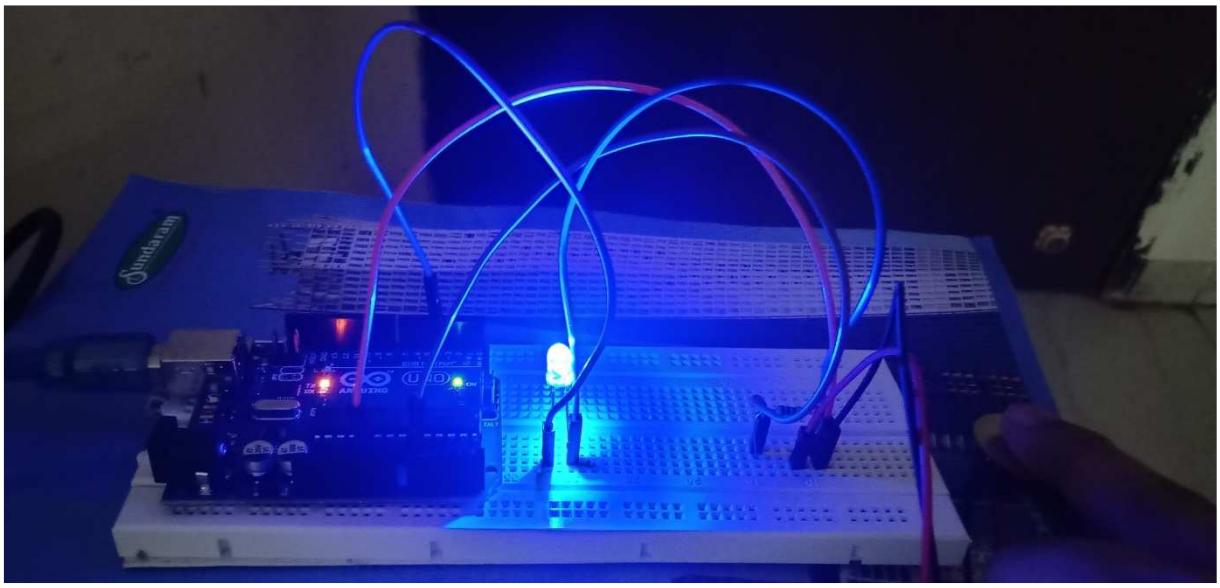
REAL TIME IMPLEMENTATION –







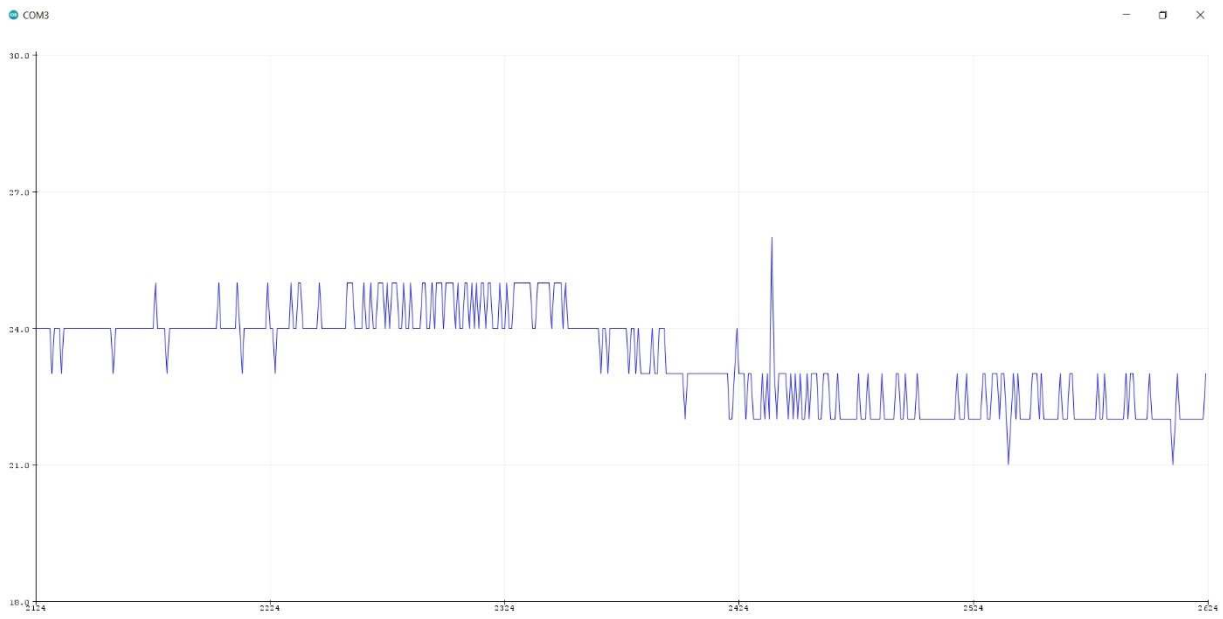




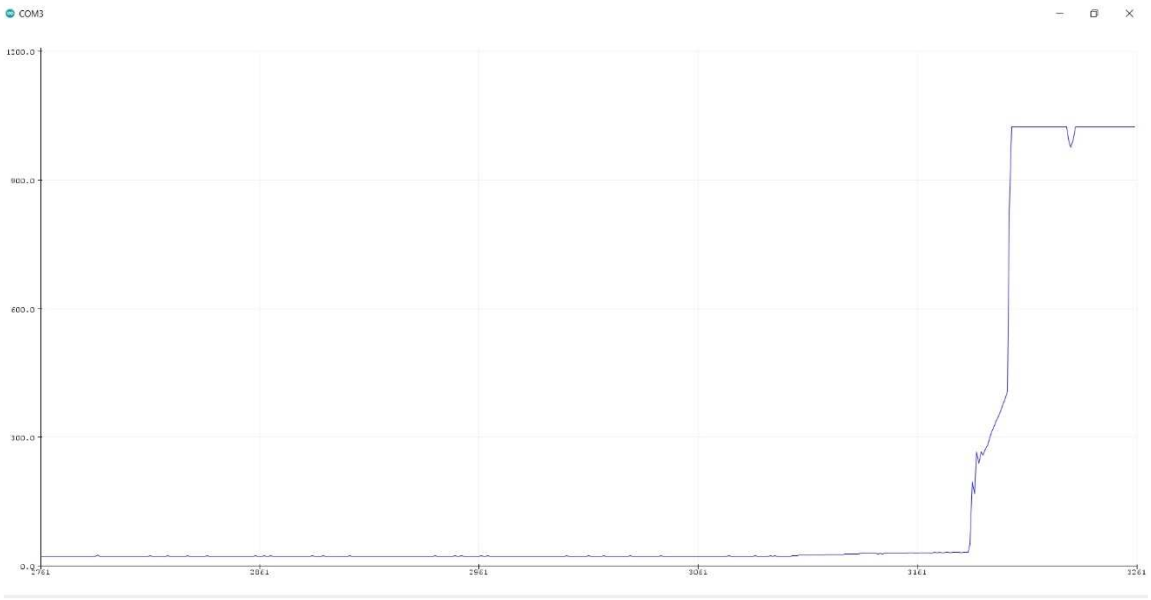
OUTPUT –

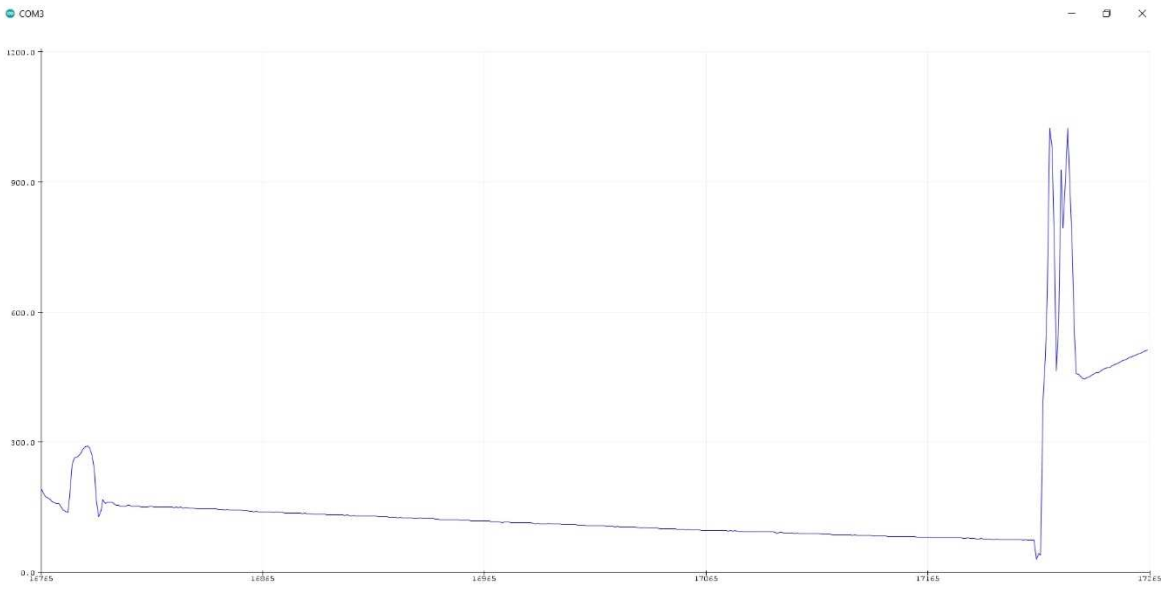
(In Terms of Waveform)

(i) When the Arduino is given power supply

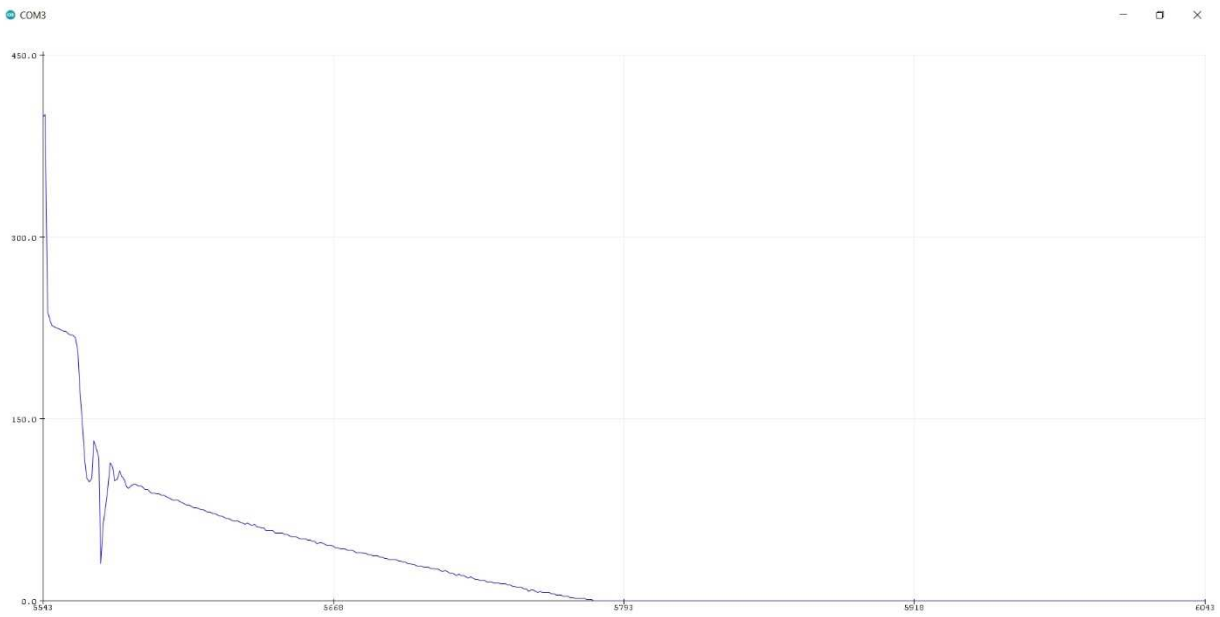


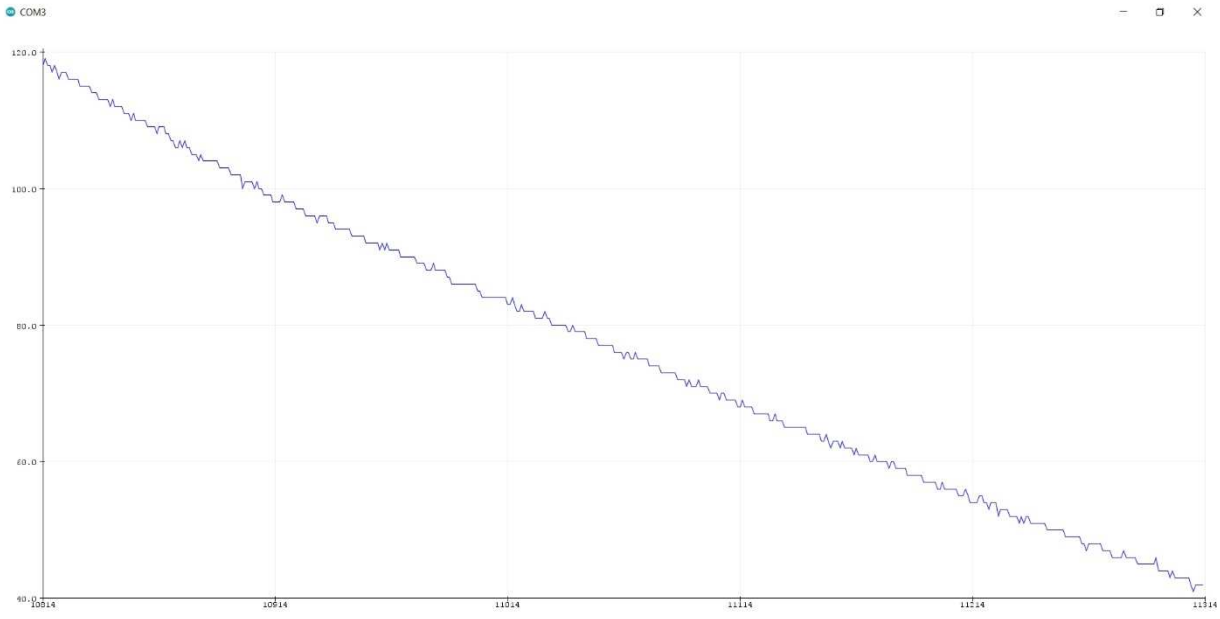
(ii) When the Piezoelectric Sensor is pressed



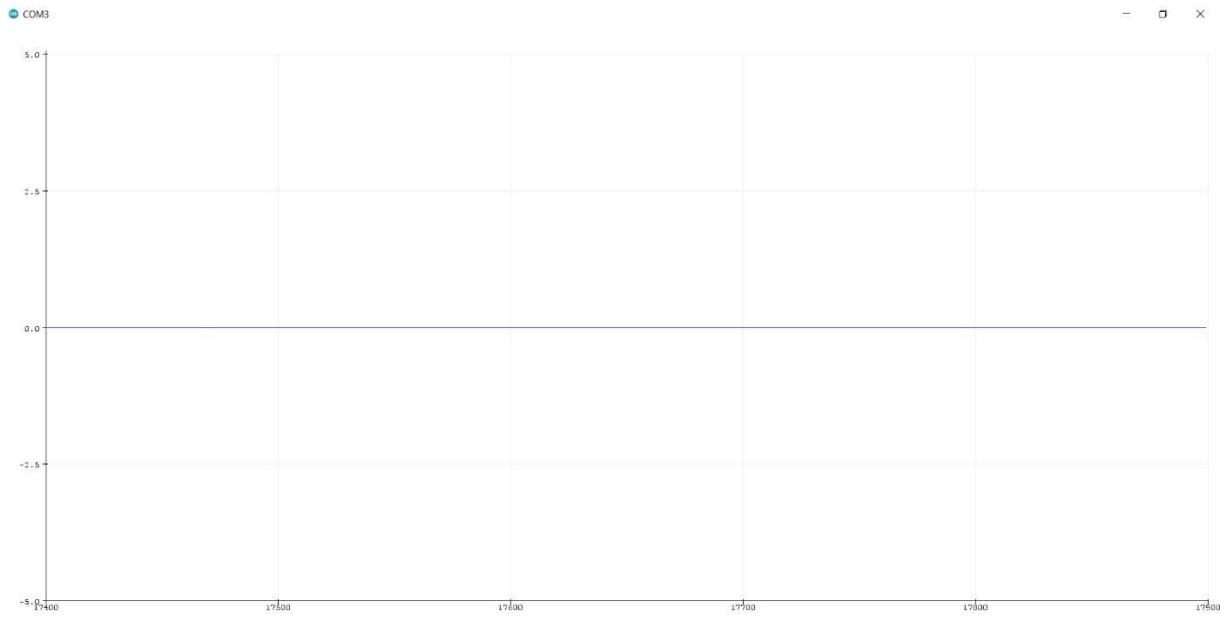


(iii) When finger is removed from the Piezoelectric Sensor





(iv) When finger is removed and not touched for few second’s



MORE OPPORTUNITIES –

- Later this system can be modified further. In this model the prototype is just about the automated street light using Piezoelectric Sensor.
- That means the vehicle goes from the piezoelectric sensor the sensor is pressed and the street light gets ONN.
- But we can also store the energy by applying the power storage device in this prototype.
- So, it will work on two ways if the vehicle passes by or a person steps on the Sensor the light will glow and also the energy can be stored later that energy can be utilize in various field wherever it is required.

CODING IN ARDUINO –

```
int led=4;
int sensor=A0;
int threshold= 400;
void setup() {
  pinMode(4,OUTPUT);
  pinMode(A0,INPUT);
 Serial.begin(9600);

}

void loop() {
  int value=analogRead(sensor);
  if (value>=threshold)
  {
    digitalWrite(4,HIGH);
    delay(100);
  }
  else
  digitalWrite(4,LOW);
  Serial.println(value);
}
```

CONCLUSION –

So, the use of Piezoelectric sensor is studied and the prototype was made and also the interface of Piezoelectric Sensor with Arduino is studied.

And more opportunities of using and innovating the prototype is briefly discussed.

REFERENCES –

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- www.youtube.com
- https://www.elprocus.com/what-is-a-piezoelectric-sensor-circuit-specifications-and-applications/
- https://en.wikipedia.org/wiki/Piezoelectric_sensor#:~:text=A%20piezoelectric%20sensor%20is%20a,press'%20or%20'squeeze'.
- Smart Street Lighting Using Piezoelectricity Gauri Sahoo, Nikhil Divekar, Ruchita Rao Assistant Professor, Department of Electronics Engineering, V.E.S. Institute of Technology, Mumbai, India UG Student, Department of Electronics Engineering, V.E.S. Institute of Technology, Mumbai, India
- DESIGN OF POWER SAVING SYSTEM FOR STREET LIGHT USING PIEZOELECTRIC MATERIAL A. SENTHILKUMAR, Assistant Professor (SS) Department of electrical and Electronics Engineering, Dr.Mahalingam College of Engineering and Technology, Anna University, pollachi–642003, Tamilnadu, India.

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