

Tinkercad Project

Problem Statement:- Motion based light control. Controlling a bulb based on a person's movement.

Apparatus Used:-

- PIR Sensor.
- Ultra-sonic sensor.
- LDR Sensor.
- Buzzer.
- Bread board
- Battery(9v).
- Light Bulb.
- Resistors.
- Arduino Uno.
- Relay.

Working:- This assignment is to detect the motion of the Person in a room using PIR Sensor. The Working of the Circuit is When a person enters in to the Room the Bulb should glow. When person Stop moving the bulb will stop glowing and Buzzer will on ,when Person Come out of room buzzer will on. This assignment also include LDR sensor. The main purpose of using LDR sensor is When the light intensity is high bulb should not glow. This is the Working of Circuit.

Theory:-

PIR Sensor:-

Passive infrared (PIR) sensors use a pair of pyroelectric sensors to detect heat energy in the surrounding environment. These two sensors sit beside each other, and when the signal differential between the two sensors changes (if a person enters the room, for example), the sensor will engage.

LDR Sensor:-

LDRs (light-dependent resistors) are used to detect light levels, for example, in automatic security lights. Their resistance decreases as the light intensity increases: in the dark and at low light levels, the resistance of an LDR is high and little current can flow through it.

Arduino Uno:-

Arduino is an open-source electronics platform based on easy-to-use hardware and software. Arduino boards are able to read inputs - light on a sensor, a finger on a button, or a Twitter message - and turn it into an output - activating a motor, turning on an LED, publishing something online.

Buzzer:-

A buzzer or beeper is an audio signaling device, which may be mechanical, electromechanical, or piezoelectric (piezo for short). Typical uses of buzzers and beepers include alarm devices, timers, and confirmation of user input such as a mouse click or keystroke.

Code:-

```
int DO_Sensor = 8;

int Sensitivity = 0;

int PIR_state = 0;

int resuldoSensorLDR;

int releNO=13;

int upin=3;

int sensorLDR = A0;

const int buz_pin=2;

void setup() {

    pinMode(buz_pin,OUTPUT);

    pinMode(releNO, OUTPUT);

    pinMode(sensorLDR, INPUT);
```

```

pinMode(DO_Sensor, INPUT);

Serial.begin(100);

}

void loop() {

    long du,cm;

    pinMode(upin,OUTPUT);

    digitalWrite(upin,LOW);

    delayMicroseconds(2);

    digitalWrite(upin,HIGH);

    delayMicroseconds(5);

    digitalWrite(upin,LOW);

    pinMode(upin,INPUT);

    du=pulseIn(upin,HIGH);

    cm=(du/2)/29;

    Sensitivity = digitalRead(DO_Sensor);

    resuldoSensorLDR = analogRead(sensorLDR);

    if(resuldoSensorLDR<600)

    {

        if (Sensitivity == HIGH || (cm >=7 && cm <333)) {

            digitalWrite(releNO,HIGH);

            PIR_state=HIGH;

            digitalWrite(buz_pin,LOW);

        }

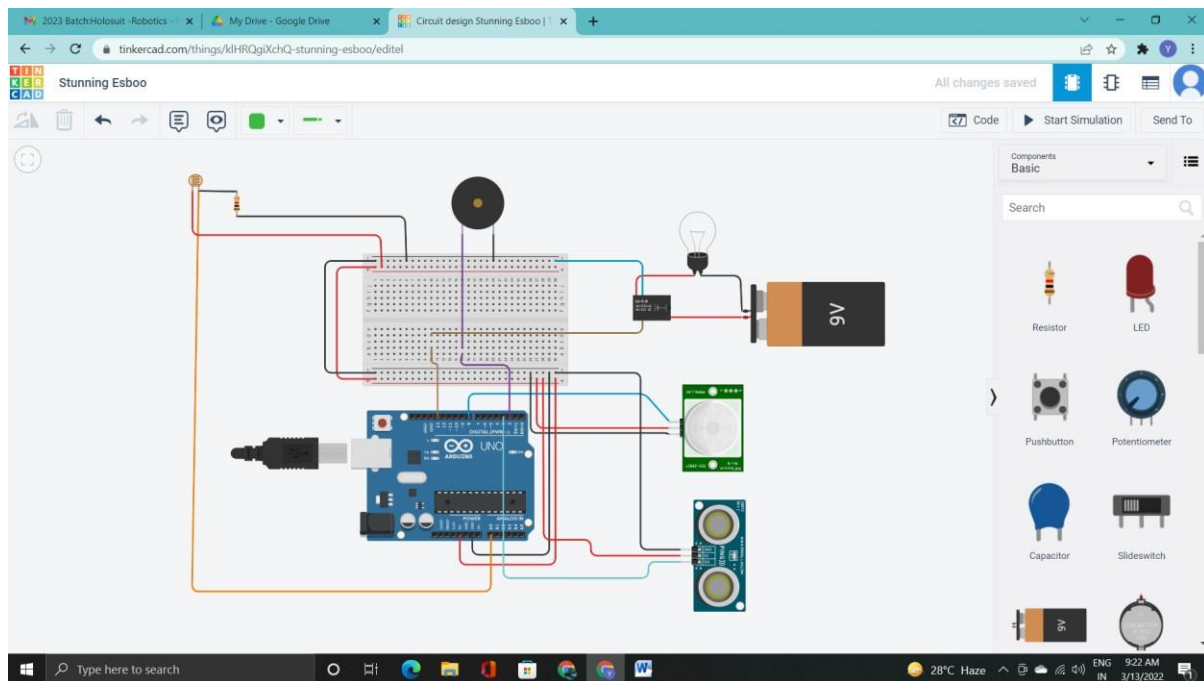
    }

}

```

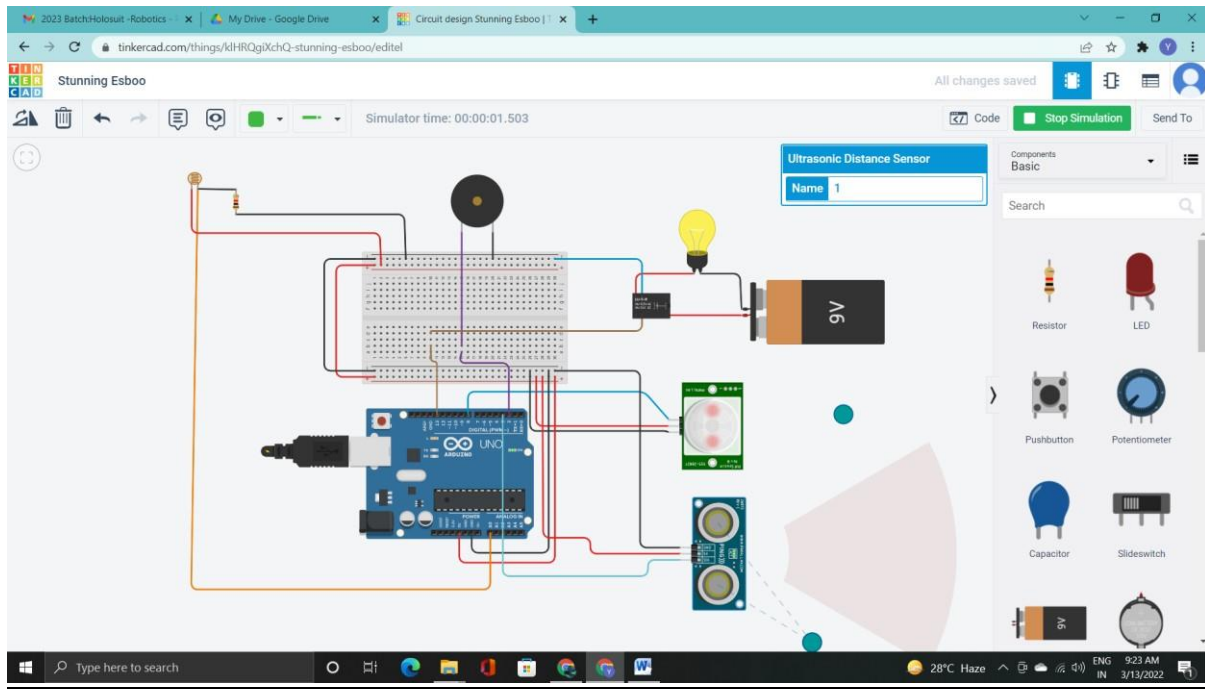
```
else{
    if(PIR_state==HIGH)
    {
        digitalWrite(buz_pin,HIGH);
        delay(10);
        digitalWrite(buz_pin,LOW);
        PIR_state=LOW;
    }
    digitalWrite(releNO,LOW);
}
}
else{
    if(PIR_state==HIGH)
    {
        digitalWrite(buz_pin,HIGH);
        delay(10);
        digitalWrite(buz_pin,LOW);
        PIR_state=LOW;
    }
    digitalWrite(releNO,LOW);
    digitalWrite(buz_pin,LOW);
}
}
```

Circuit diagram:-

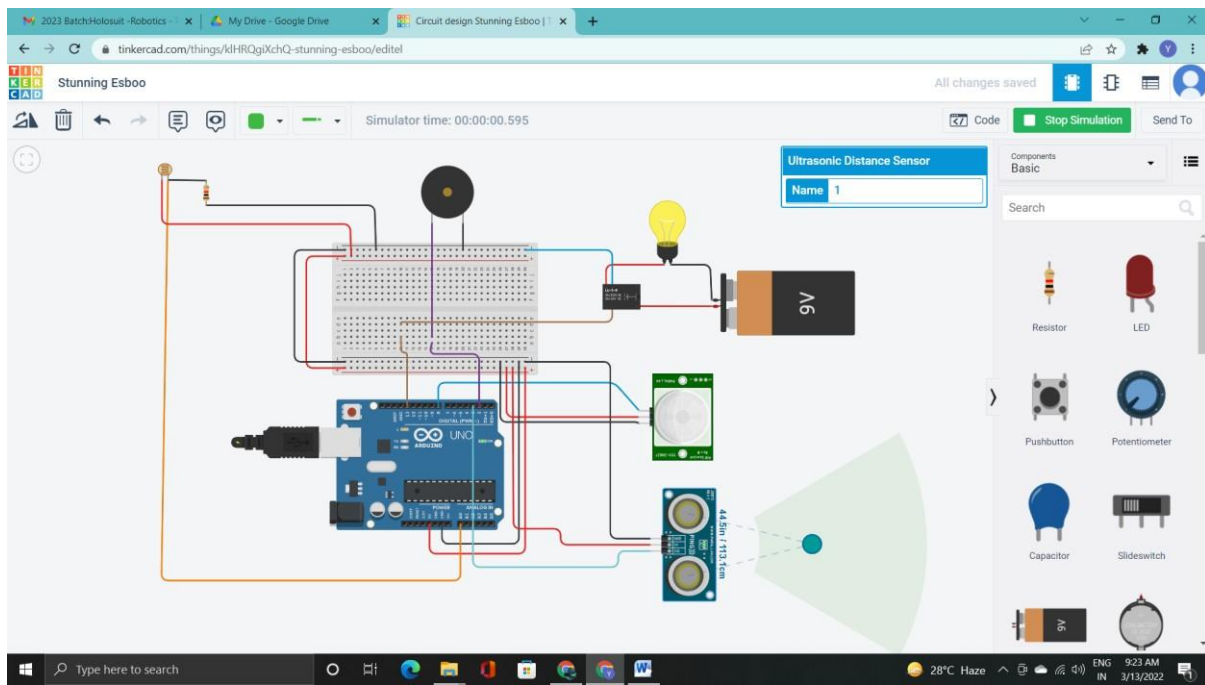


Output:-

-Using PIR sensor:



Using Ultra-Sonic sensor:



Conclusion:

Hence, the light was controlled by the motion and range detection of a person using both PIR sensor and Ultra-sonic sensor