

LIGHT AUTOMATION SYSTEM

A Project Report

***In the partial fulfillment for the award of the degree of
B.Tech***

Submitted by

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Certificate from the Mentor

This is to certify that **Akash Goswa ,Antara Ghosh, Eshita Roy , Gouranga Das** has successfully completed the project titled [**LIGHT AUTOMATION SYSTEM**] under my supervision during the period from February to May which is in partial fulfillment of requirements for the award of the B.Tech and submitted to Department Electronics and Communication Engineering. of **Netaji Subhash Engineering College.**

Signature of the Mentor

Date: 19nd MAY,2023

Acknowledgement

I take this opportunity to express my deep gratitude and sincerest thanks to my project mentor,

Ms. SAHELI SARKHEL for giving the most valuable suggestion, helpful guidance and encouragement in the execution of this project work.

PROJECT OBJECTIVE

We have done Light Automation System and our main objective is to save Energy. By this project, we are reducing the amount of time, a bulb used thus reducing electricity bill.

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PROJECT COMPONENT LIST

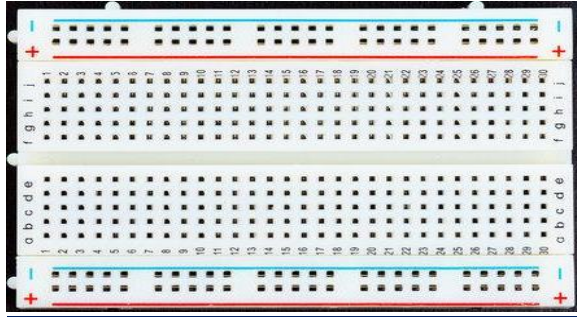
1. Arduino uno
2. Breadboard
3. LED
4. Resistor
5. PIR Sensor
6. LDR
7. Jumper Wire

DESCRIPTION OF EACH COMPONENT

- **Arduino uno** : Arduino Uno is a microcontroller board based on the ATmega328P (datasheet). It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz ceramic resonator (CSTCE16M0V53-R0), a USB connection, a power jack, an ICSP header and a reset button.



- **BreadBoard** : A **breadboard** is a solderless device for temporary prototype with electronics and test circuit designs. Most electronic components in electronic circuits can be interconnected by inserting their leads or terminals into the holes and then making connections through wires where appropriate.



- **LED** : A light-emitting diode (LED) is a [semiconductor light source](#) that emits light when [current](#) flows through it. [Electrons](#) in the semiconductor recombine with [electron holes](#), releasing energy in the form of [photons](#). The color of the light (corresponding to the energy of the photons) is determined by the energy required for electrons to cross the [band gap](#) of the semiconductor. White light is obtained by using multiple semiconductors or a layer of light-emitting phosphor on the semiconductor device.



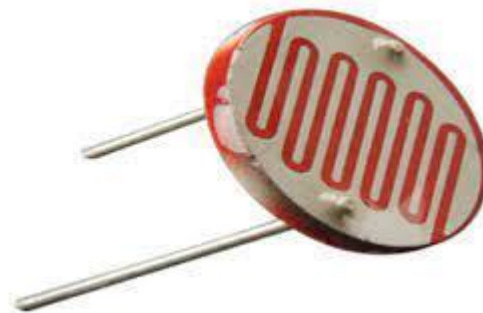
- **Resistor**: A **resistor** is a passive two-terminal electrical component that implements electrical resistance as a circuit element. In electronic circuits, **resistors** are used to reduce current flow, adjust signal levels, to divide voltages, bias active elements, and terminate transmission lines, among other uses.



- **PIR Sensors:** A **passive infrared sensor (PIR sensor)** is an electronic **sensor** that measures infrared (IR) light radiating from objects in its field of view. They are most often used in **PIR-based motion detectors**. **PIR sensors** are commonly used in security alarms and automatic lighting applications.



- **LDR :** A **photoresistor** (also known as a **light-dependent resistor, LDR**, or **photo-conductive cell**) is a passive component that decreases resistance with respect to receiving luminosity (light) on the component's sensitive surface. The [resistance](#) of a photoresistor decreases with increase in incident light intensity; in other words, it exhibits [photoconductivity](#). A photoresistor can be applied in light-sensitive detector circuits.



- **Jumper Wire:** **Jumper cables** is a smaller and more bendable corrugated cable which is used to connect antennas and other components to network cabling.



PROJECT DISCUSSION

Our project counts the no of people entering and exiting from the room. Using two PIR sensor side by side we created a SINGLE DOOR COUNTER. When a person entered in room our counter counts adds 1. If a person exits the room counter subtracts 1. By doing this it can determine no of people present in room. We are also using ldr sensor for detecting light intensity. If no of people is greater than one and light intensity in below our selected threshold intensity then light will be turned on. If people is present but light intensity above threshold then lights will not turned on. If light intensity in below our selected threshold intensity but there is no people in the room lights will turned off.

METHODOLOGY

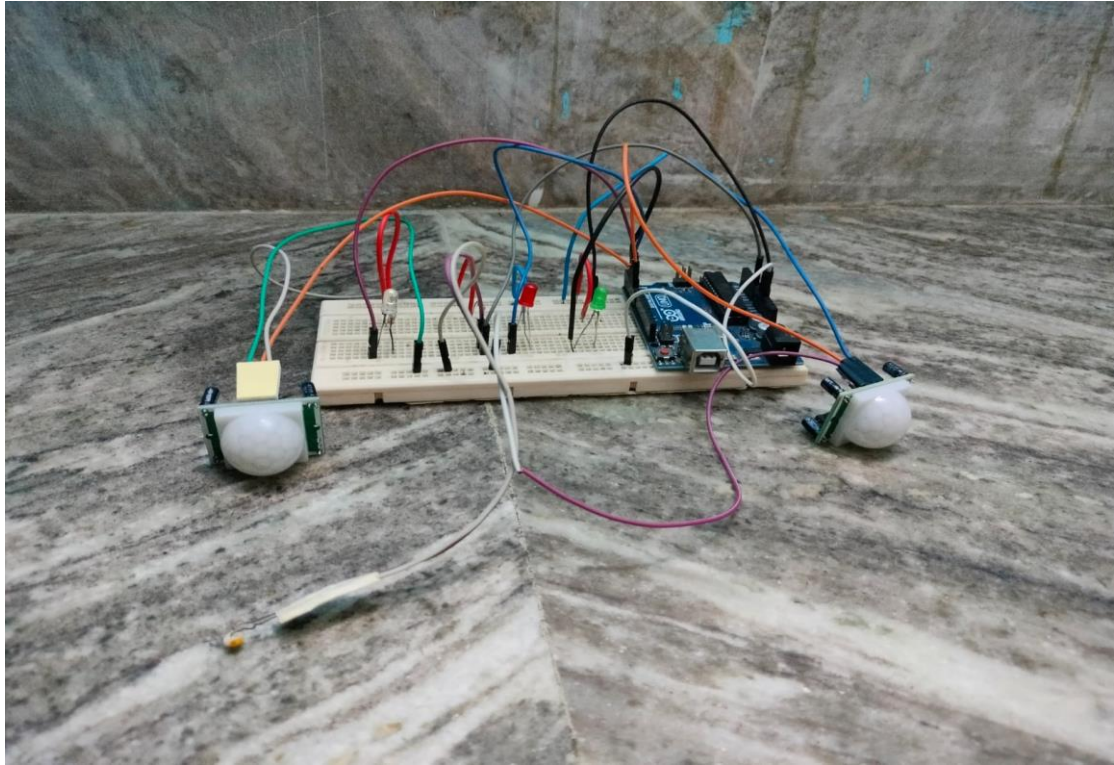
- *Input pin of 1st pir sensor connected to arduino digital port 5. Gnd and vcc pin connected to gnd and vcc of arduino using breadboard.*
- *Input pin of 2nd pir sensor connected to arduino digital port 6. Gnd and Vin pin connected to gnd and vcc of arduino using breadboard.*
- *LDR one pin connected to Vcc and othe pin is connected to analog pin A0 and gnd using 1k resistor*
- *Green, Red, Blue led input pins are connected to digital port 2 ,3 ,4 respectively. Their output pin is connected to gnd using resistors.*
- *When one person entered the room the no of people is one. Now ldr reading is lesser than threshold value. So lights are turned on. Now another person entered the room. So no of people becomes 2. So light is still on.*
- *Now two person exit the room one by one. So no of people is zero. So light is turned off though ldr reading is greater than threshold.*
- *If person is present in the room but light intensity is more than threshold light will turned off.*

Code of Arduino uno

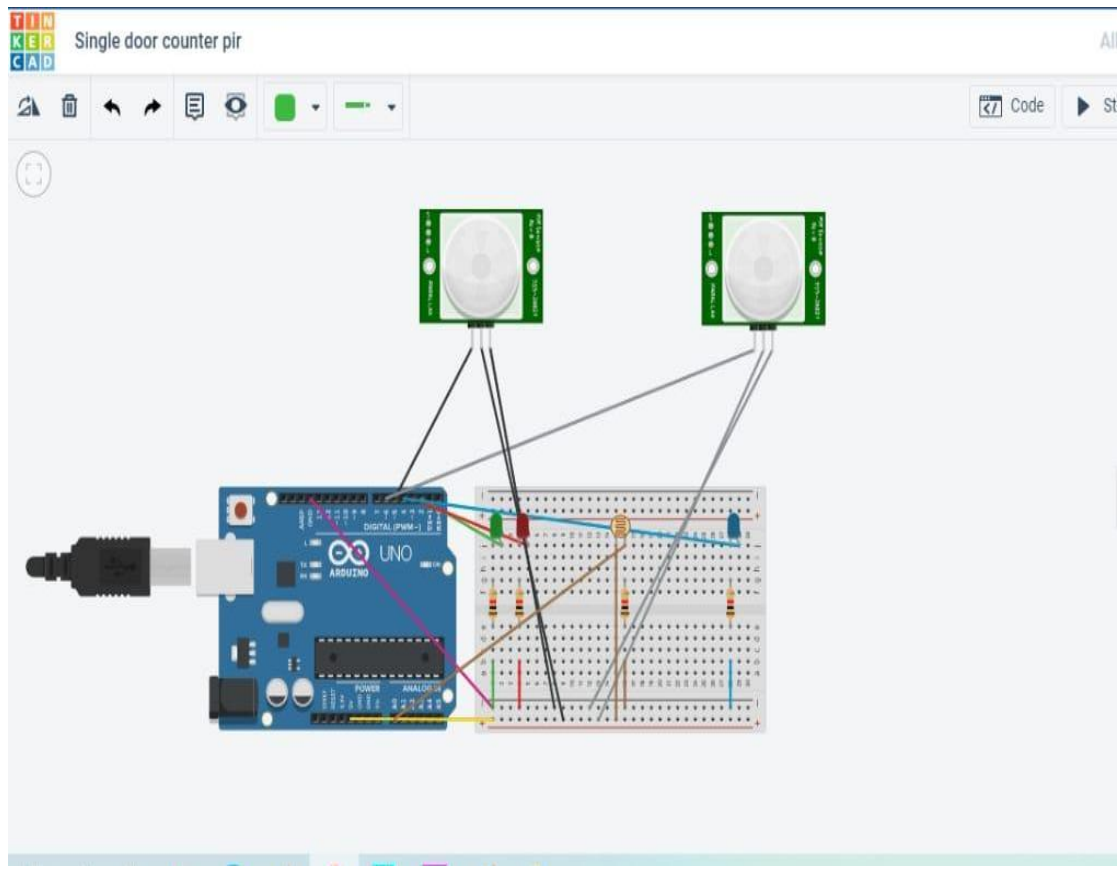
```
define ldr A0  
int thrs = 100;  
int green = 2;  
int red = 3;  
int Delay = 1000; // delay in ms  
int relay = 4;  
int ir1 = 5;  
int ir2 = 6;  
void setup() {  
    pinMode(green, OUTPUT);  
    pinMode(red, OUTPUT);  
    pinMode(relay, OUTPUT);  
    pinMode(ir1, INPUT);  
    pinMode(ir2, INPUT);  
    Serial.begin(9600);  
}  
void loop() {  
    static int count = 0;  
    if(digitalRead(ir1) == 0){
```

```
digitalWrite(green, HIGH);
delay(Delay);
digitalWrite(green, LOW);
count++; }
if(digitalRead(ir2) == 0){
    digitalWrite(red, HIGH);
    delay(Delay);
    digitalWrite(red, LOW);
    count--;
}
int lux = analogRead(ldr);
Serial.print("No of People in room : ");
Serial.println(count);
Serial.print("Lux : ");
Serial.println(lux);
if((count>0) && (lux<thrs)){
    digitalWrite(relay, HIGH);
}
else{
    digitalWrite(relay, LOW); }
}
```

PROJECT PICTURE

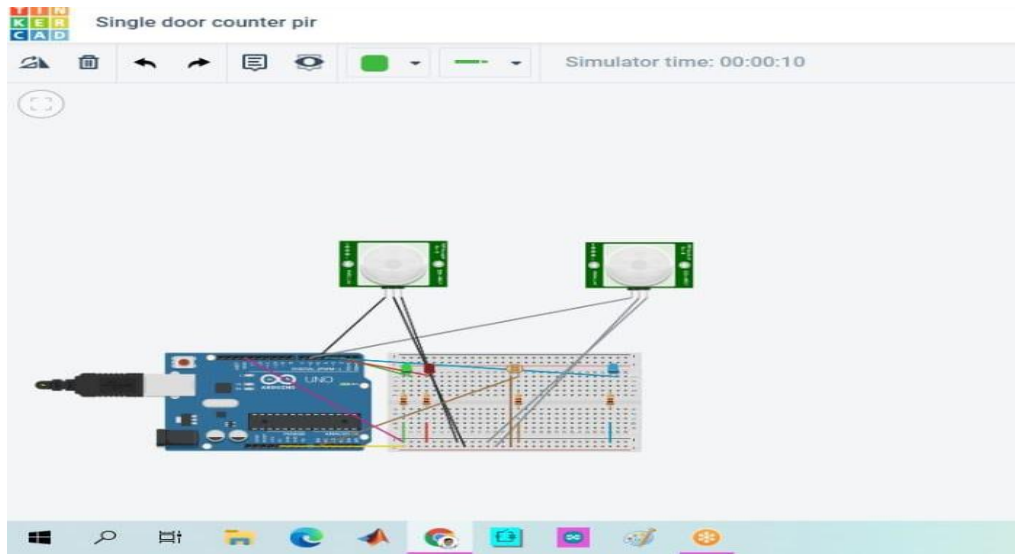


PROJECT CIRCUIT DIAGRAM



RESULT

When one person entered the room the no of people is one. Now ldr reading is lesser than threshold value. So lights are turned on. Now another person entered the room. So no of people becomes 2. So light is still on.

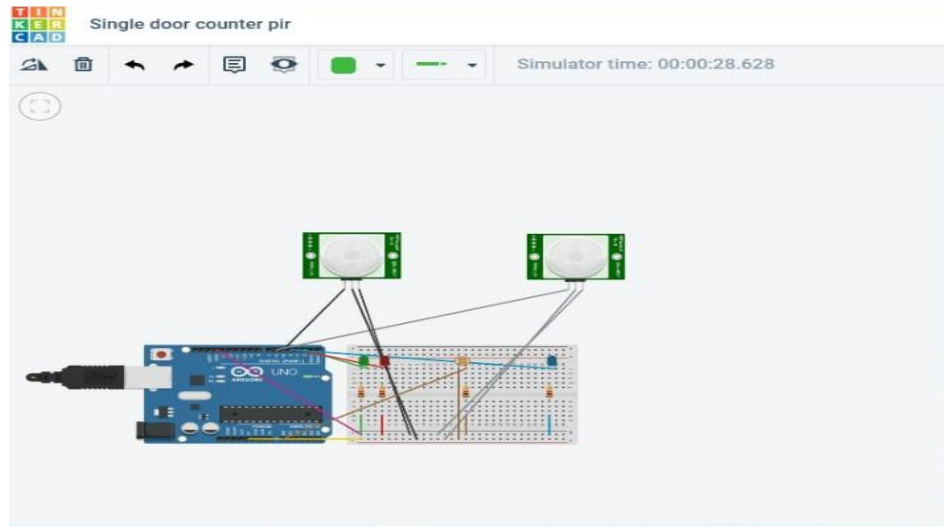


Light is on



No of people 2

Now two person exit the room one by one. So no of people is zero. So light is turned off though ldr reading is greater than threshold.



Light is off



No of people zero

CONCLUSION

After observing the results we can conclude that the system is working as intended i.e as people entered or exit the room the single door counter can count the no of people present in the room. Using the data collected from ldr and single door counter the system can automatically turn on or off light thus reduces the wastage of electricity.

REFERENCES

We can't complete this project without the help of Saheli Sarkhel maam . Thankyou maam for guiding us.

WEBSITES WHICH HELPED US:

<https://www.google.co.in/>

https://en.wikipedia.org/wiki/Main_Page

<https://www.youtube.com/>

<https://www.tinkercad.com/>

