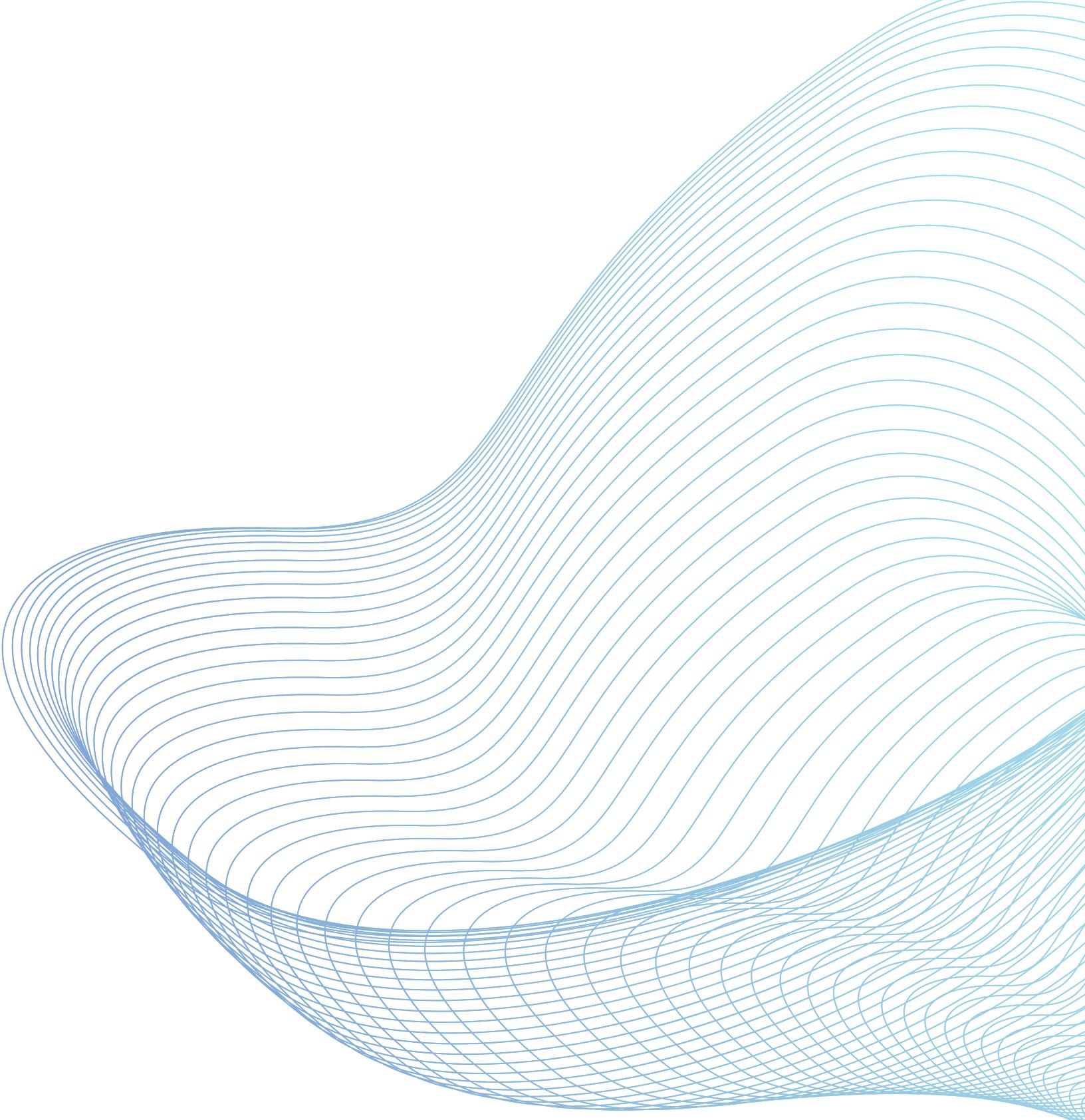




PDPM
IITDM
JABALPUR

ILLUMISENSE

**AMBIENT LIGHT-AWARE
BRIGHTNESS**



Computer Organization And Architecture



COMPONENTS

- Jumper Wires
- Arduino Uno Board
- LED Lights
- LDR
- PIR
- Resistors
- Breadboard



INTRODUCTION

A large, abstract graphic element consisting of numerous thin, light blue lines that curve and overlap, creating a sense of depth and motion. It spans the width of the page and is positioned behind the text blocks.

Introducing our cutting-edge project for a more convenient and energy-efficient lifestyle. Our automatic light sensor revolutionizes your lighting experience.

No more worries about leaving lights on in empty rooms; the sensor detects people's presence and turns off lights when they're not around, reducing unnecessary energy use.

But it goes further: it adjusts light brightness based on natural light, optimizing conditions day and night.

IDEATION

We've noticed that ATMs, found in cities and towns, have things like fans and lights to make customers comfortable. But sometimes, these fans and lights keep running even when no one's using the ATM, which is a waste of electricity. A way to fix this is by putting motion sensors and timers in ATM places. These devices can tell when there are no customers around, and they can turn off the fans and lights by themselves. This helps save a lot of electricity.



OUR APPROACH

In this microcontroller-based project we are using the Arduino Uno, LDR sensor and motion sensor. The different components and their work as used in the project are as follows:

1. Sensors

: The project uses two sensors. First one being the LDR Sensor.

● LDR:

(Light Dependent Resistor) is a component that has a (variable) resistance that changes with the light intensity that falls upon it. The LDR sensor will be used to monitor the intensity of natural light in the surrounding and accordingly change the brightness of the LED light to the required amount.

The second sensor used in the project is Motion Sensor.

- **Motion Sensor:**

A motion sensor (or motion detector) is an electronic device that is designed to detect and measure movement. The motion sensor will be used to detect movement near the light and then turn the light on and off accordingly.

2. Jumper Wires: Jumper wires are simply wires that have connector pins at each end, allowing them to be used to connect two points to each other without soldering.

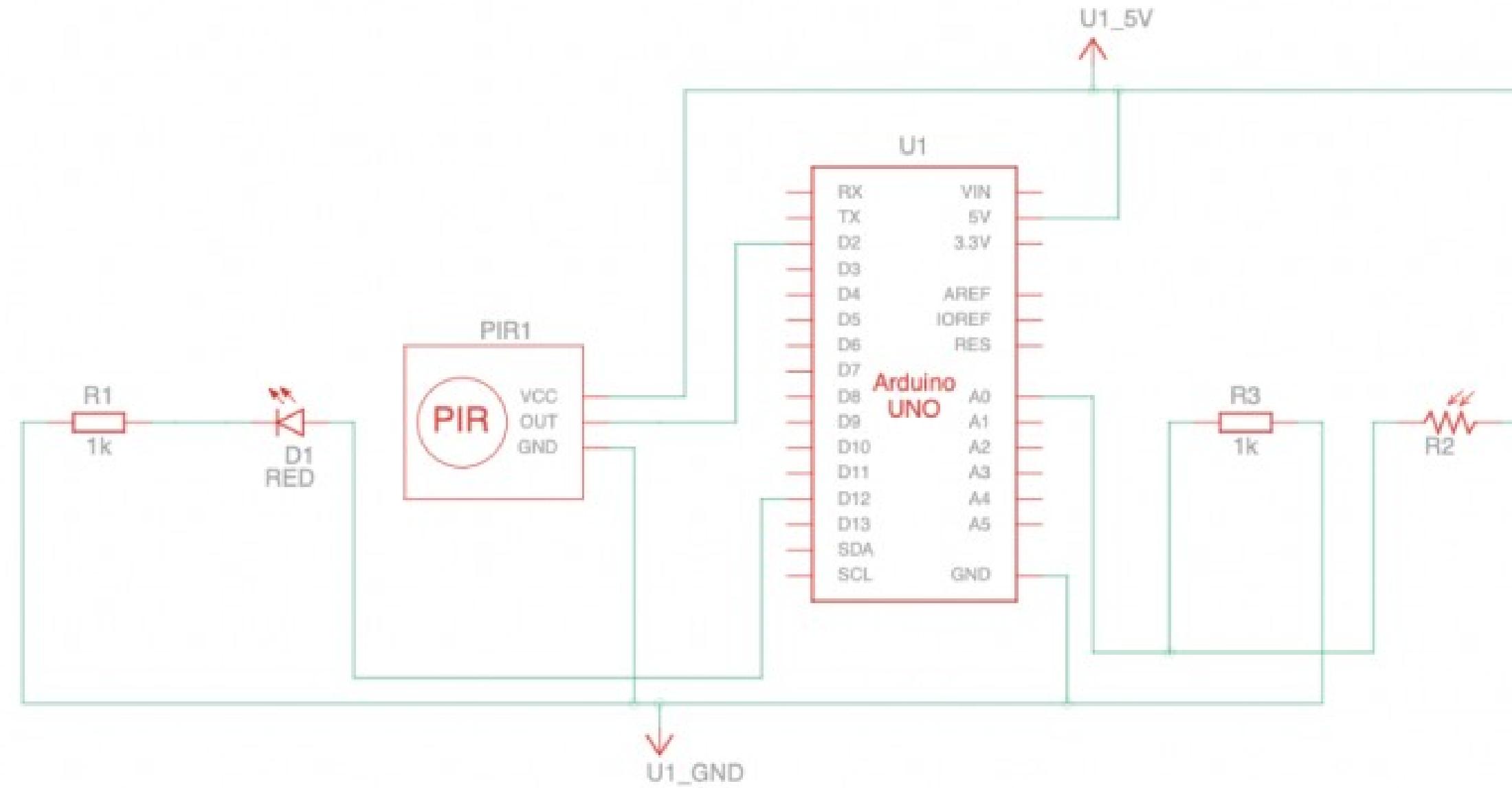
2. Jumper Wires: Jumper wires are simply wires that have connector pins at each end, allowing them to be used to connect two points to each other without soldering.

3. Arduino Uno Board:

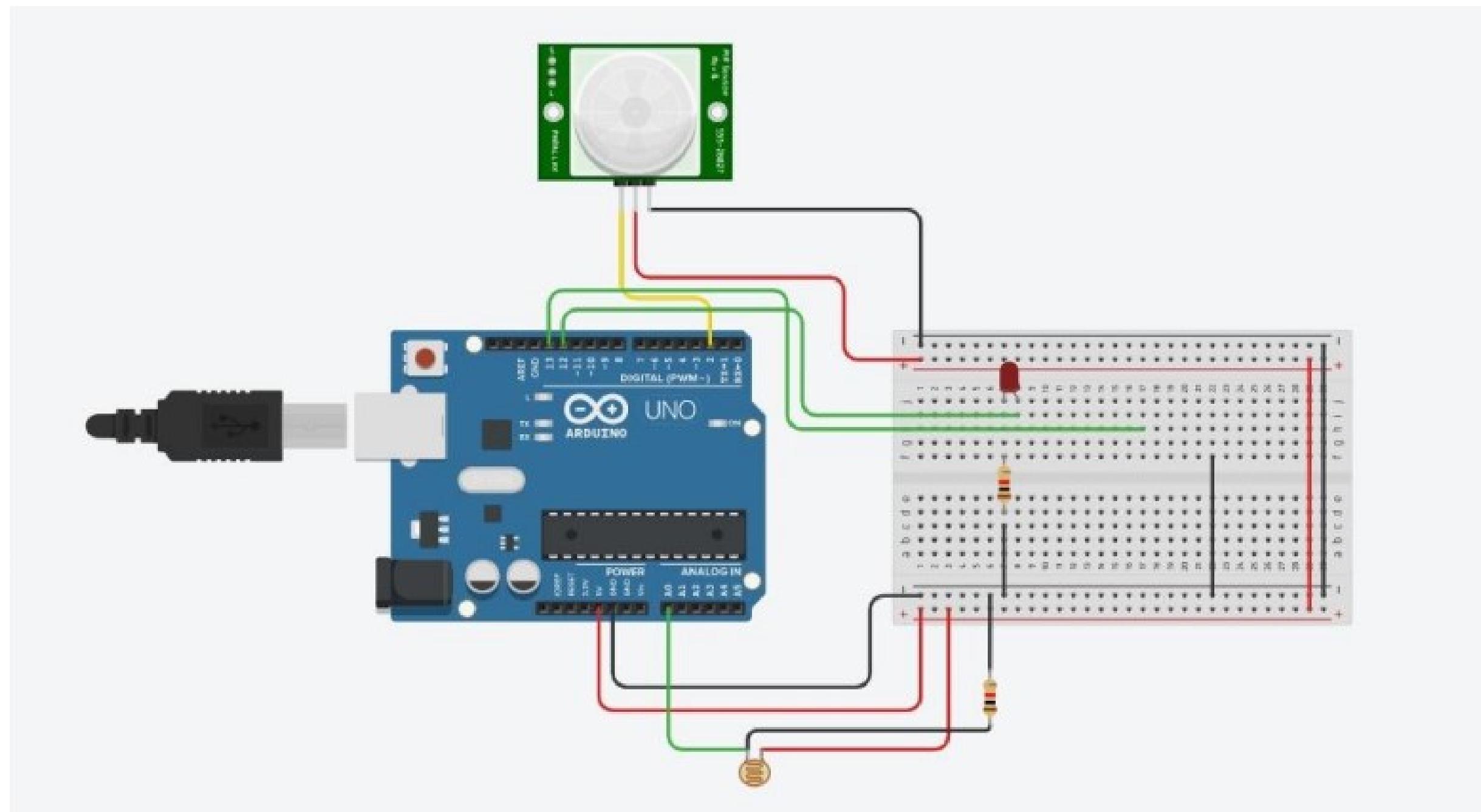
The Arduino Uno is an open-source microcontroller board based on the Microchip ATmega328P microcontroller. The board has 14 digital I/O pins (six capable of PWM output), 6 analog I/O pins, and is programmable with the Arduino IDE (Integrated Development Environment), via a type B USB cable. The Arduino Uno board will be required and programmed so as to read and record the data from the LDR and motion sensor and then accordingly send signals to the LED and thus turn it on/off or change the brightness of the LED as required.

4. LED Lights:

The light-emitting diode (LED) is today's most energy-efficient and rapidly-developing lighting technology and hence we will be using LED in our project as the source of light.



Circuit View



Working Code for Arduino



```
1 int brightness = 0;
2 const int pinLDR = A0;
3 const int pinSensor = 2;
4 const int pinLed = 12;
5 const int pinBuzzer = 13;
6 const int pirSensor = 0;
7
8 void setup()
9 {
10     pinMode(pinSensor, INPUT);
11     pinMode(pinLed, OUTPUT);
12     pinMode(pinLDR, INPUT);
13     Serial.begin(9600);
14 }
15
16 void loop()
17 {
18     int statusLDR = analogRead(pinLDR);
19
20     if (statusLDR <= 100)
21     {
22         brightness = 255;
23     }
```

```
1     else if (statusLDR <= 200)
2     {
3         brightness = 220;
4     }
5     else if (statusLDR <= 350)
6     {
7         brightness = 150;
8     }
9     else if (statusLDR <= 550)
10    {
11        brightness = 100;
12    }
13    else
14    {
15        brightness = 0;
16    }
17
18    Serial.println(brightness);
19    pirSensor = digitalRead(pinSensor);
20    if (pirSensor == HIGH && brightness != 0)
21    {
22        digitalWrite(pinLed, HIGH);
23    }
24    else
25    {
26        digitalWrite(pinLed, LOW);
27    }
28
29    delay(10);
30 }
```

• ADVANTAGES

1. Electric lighting energy use can be adjusted by automatically dimming and/or switching electric lights in response to the level of available daylight. Reducing the amount of electric lighting used when daylight is available is known as daylight harvesting.
2. It detects both motion and change of brightness .

• HOW CAN WE IMPROVE?

1. We can use ultrasonic sensor instead of infrared sensor because these sensors can typically have a range of several meters to tens of meters, depending on the specific model and application.
2. The advantage of ultrasonic devices is that they are sensitive to all types of motion and generally there are zero coverage gaps, since they can detect movements not within the line of sight.
3. They have a shorter range compared to ultrasonic sensors, typically up to a few meters.

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**THANK
YOU**