

EDC Innovative Project Presentation



PIR Motion Sensing
Energy Saving Lamp

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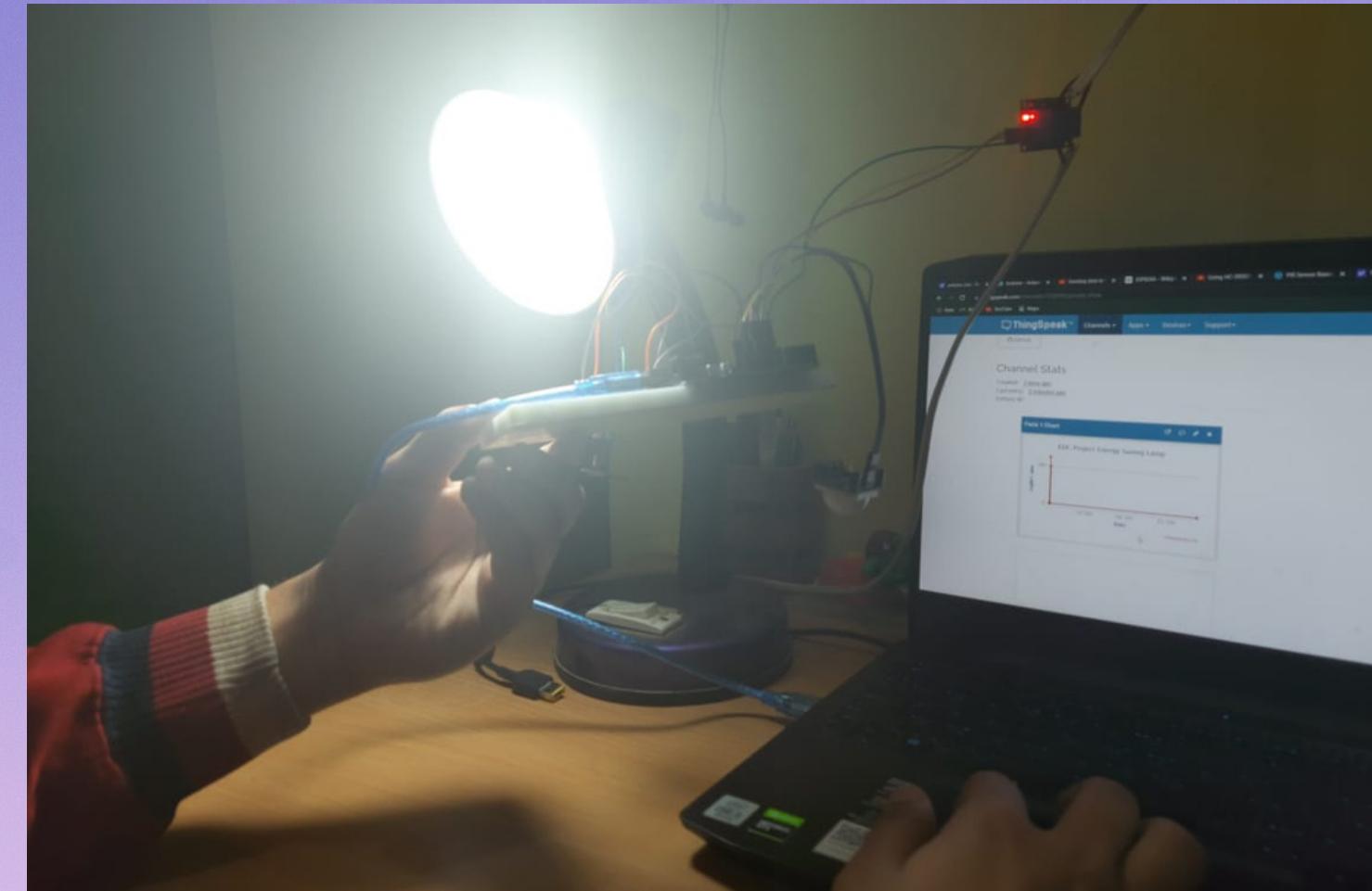
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INTRODUCTION

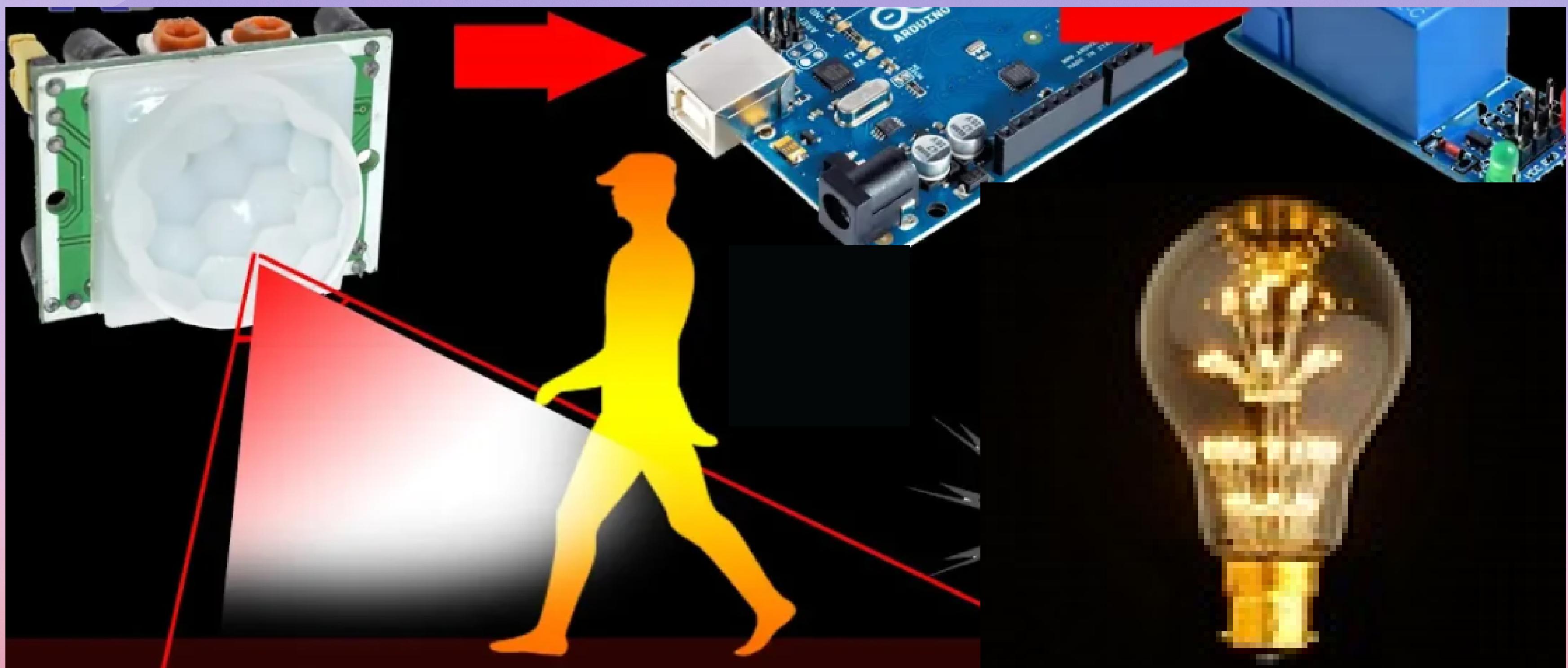
In this project, we have tried to make a prototype of a streetlight that will glow in the night and it will glow in the morning when it encounters any motion. The component used are : Study lamp, Arduino,ESP8266 Module, HC-SR501 PIR motion sensor , Relay 250 V AC, Breadboard,Jumper wires



The main objective of this project is to save electrical energy by using an I.R motion sensor that will allow the lamp to glow whenever it encounters any motion.

WORKING

Whenever any motion is detected by the HC-SR501 PIR motion sensor then it will send signal to the arduino microcontroller and arduino will send that signal to the relay and relay will turn on/off the streetlight



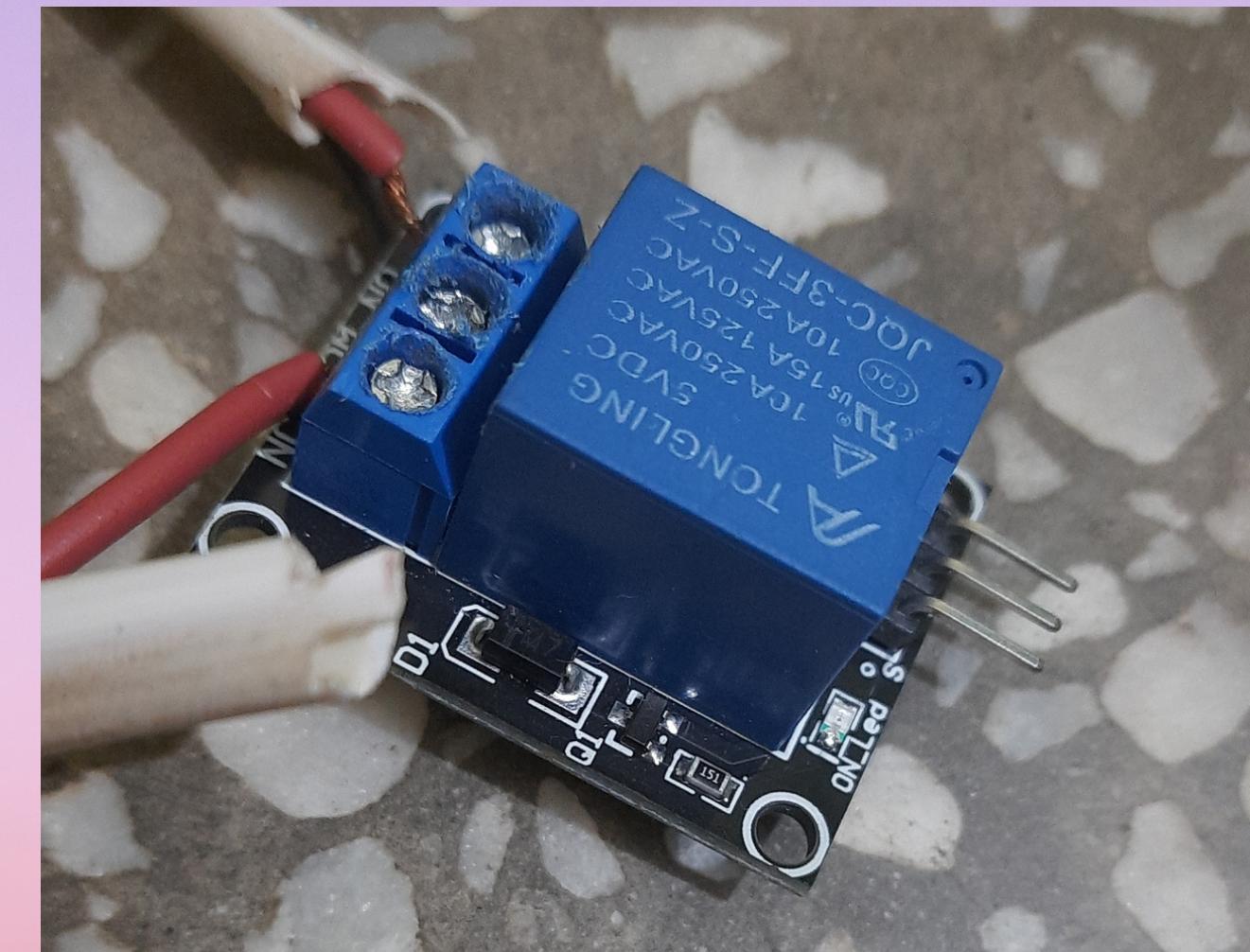
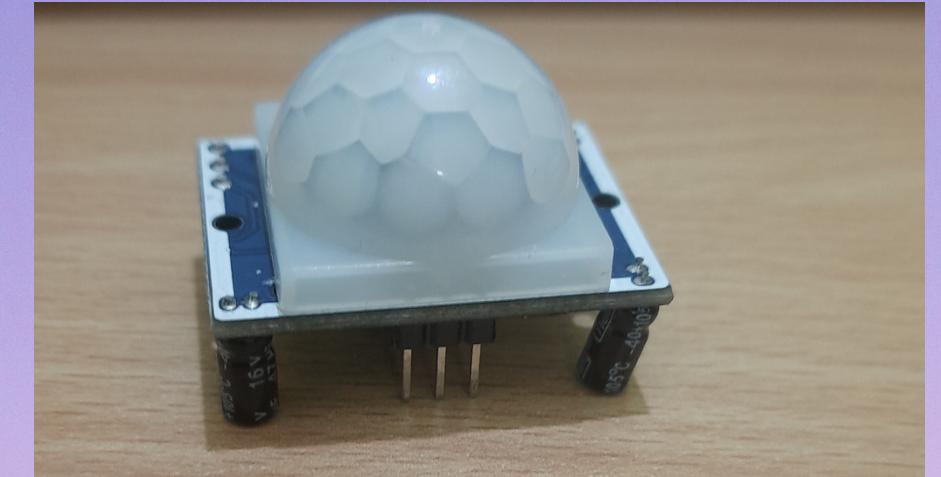
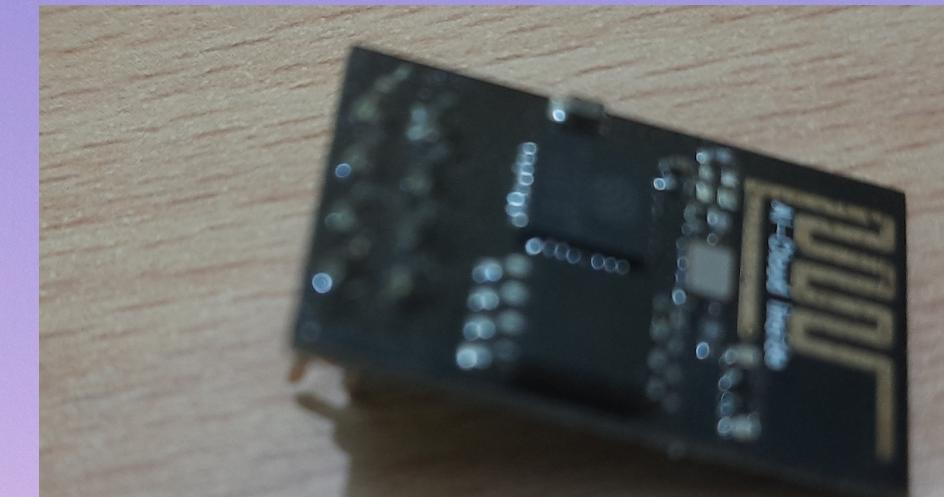
INSPIRATION

We often encounter some of the street light in specific area That glows even in the morning which leads to the unusual electricity wastage so to minimize this kind of electricity wastage we have made a prototype of a street light using motion sensor which will glow in the night and in the morning it will glow only when there is any motion.

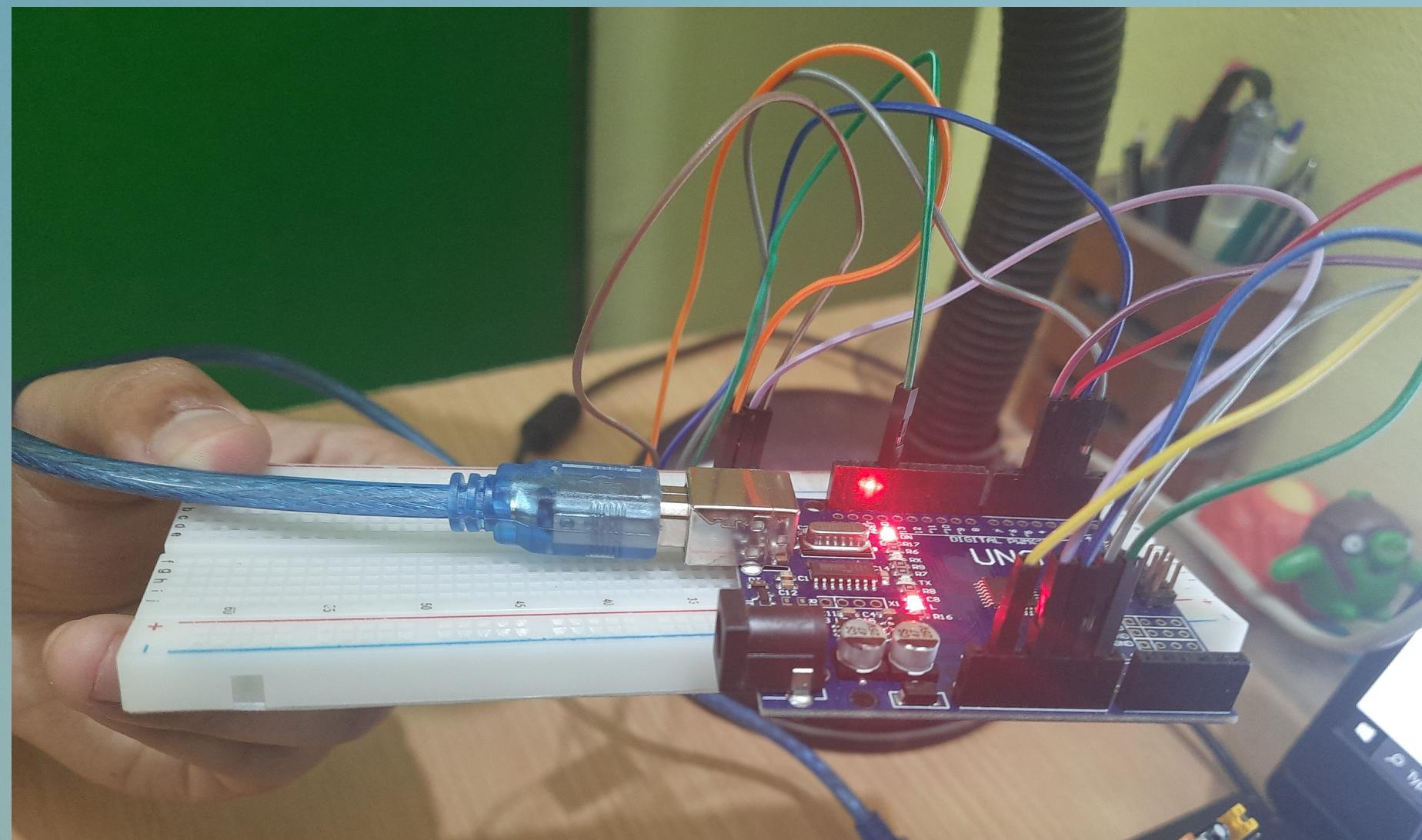


COMPONENT REQUIRED

- 1) Lamp
- 2) Arduino UNO
- 3) ESP8266
- 4) P.I.R Motion Sensor
- 5) Relay
- 6) Breadboard
- 7) Connecting wires

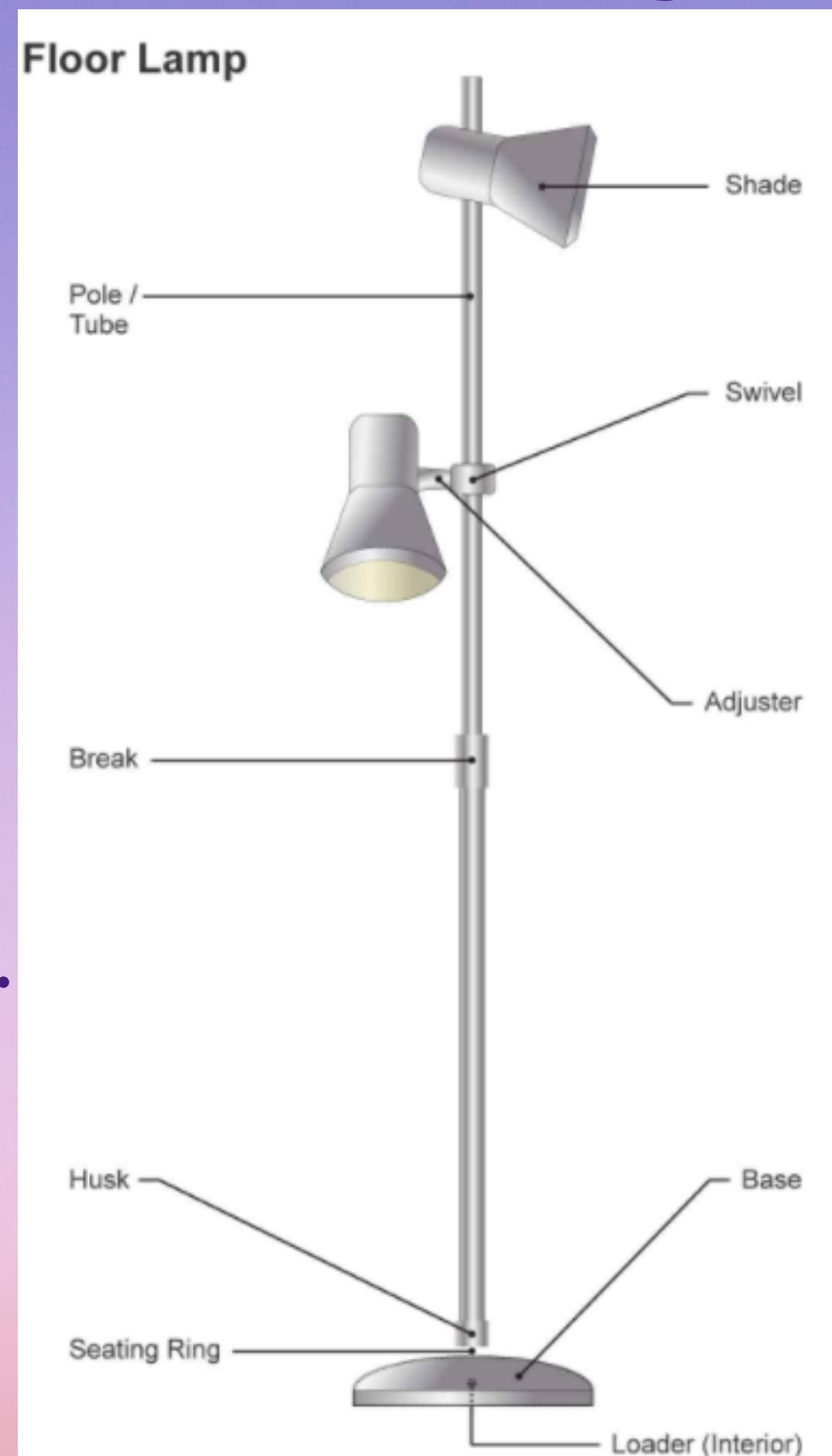


Circuit Diagram



LAMP / Demo-Street light

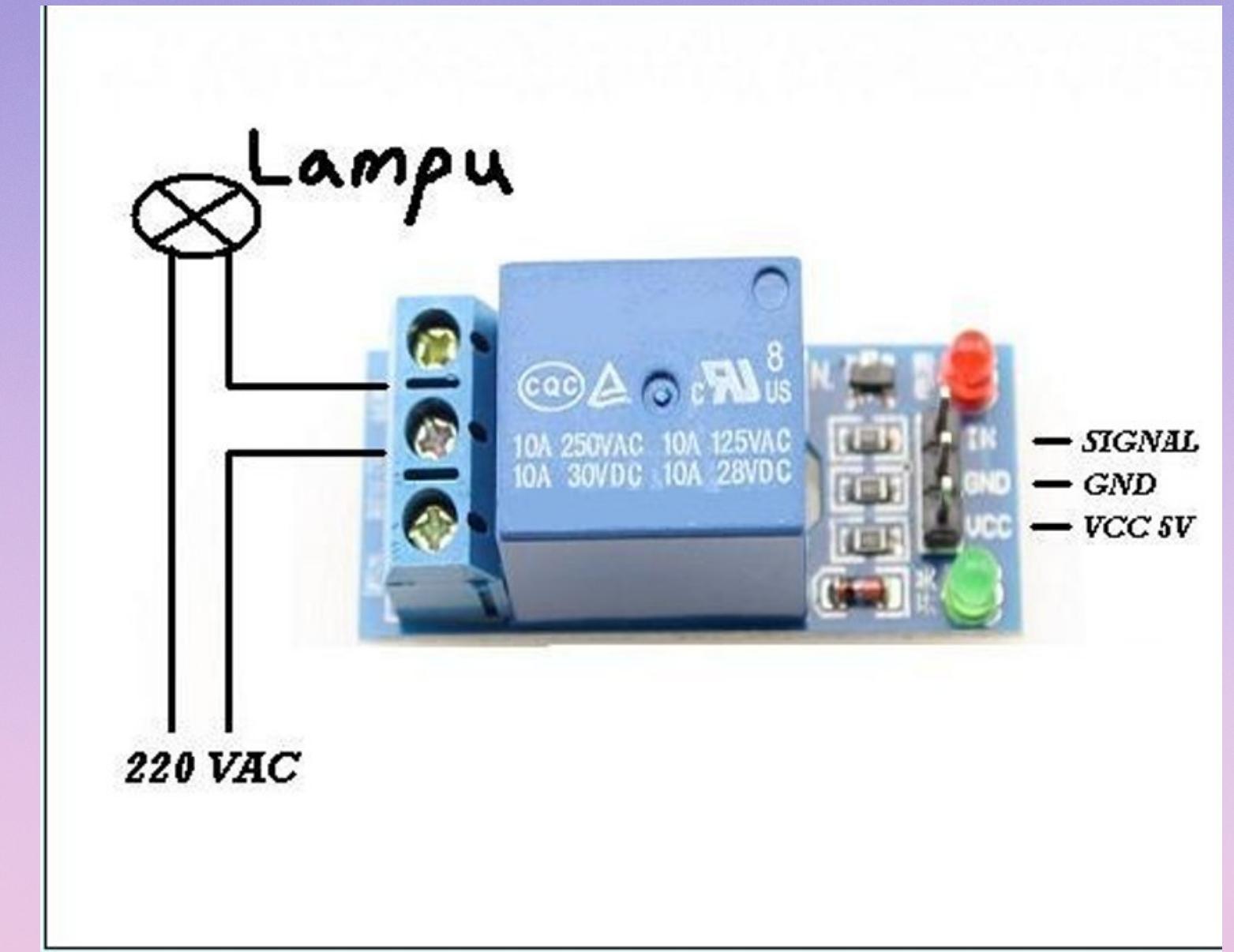
- Shade: directs and controls light from bulb.
- Pole/tube: Structure providing height to which shade and bulb attach.
- Adjuster: Swivel component to adjust direction of shade.
- Break: Component that secures / loosens top pole from bottom poll to adjust floor lamp height.
- Husk: Attaches poll to floor lamp base.
- Base: Usually fairly heavy and wide (in relation to lamp poll) to anchor floor lamp and keep it upright.



RELAYS

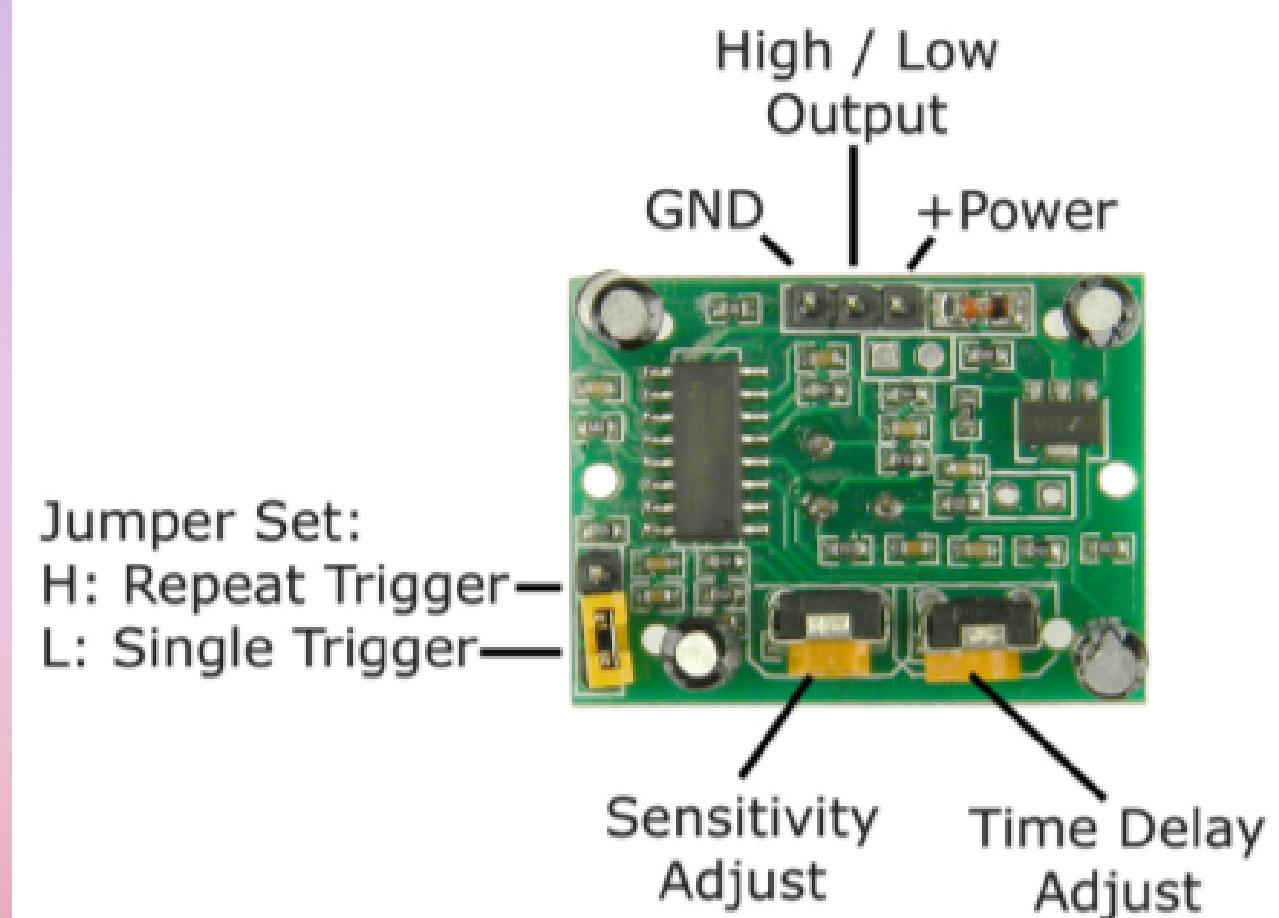
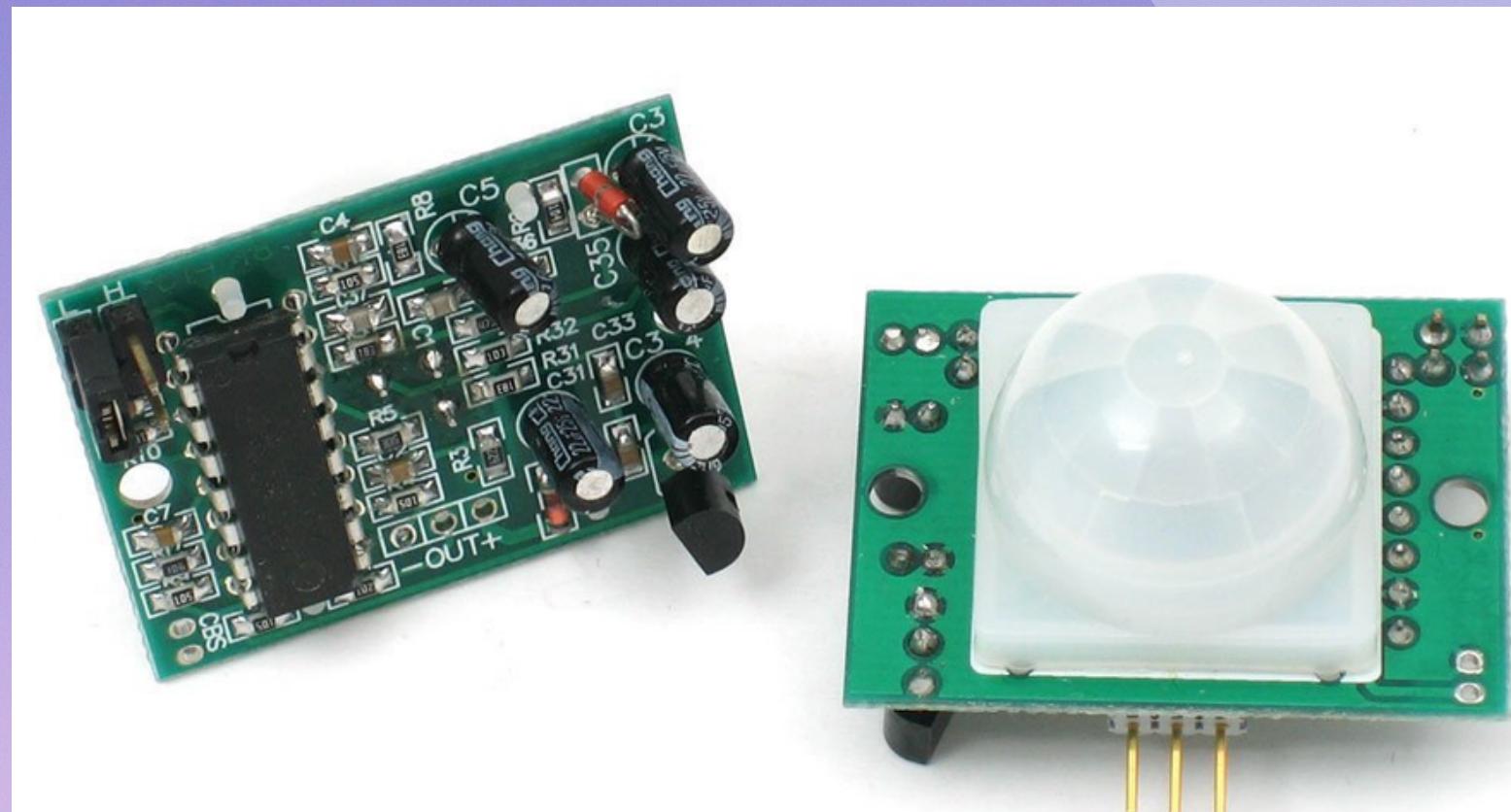
A relay is an electrically operated switch. It consists of a set of input terminals for a single or multiple control signals, and a set of operating contact terminals. The switch may have any number of contacts in multiple contact forms, such as make contacts, break contacts, or combinations thereof.

Relays are used where it is necessary to control a circuit by an independent low-power signal, or where several circuits must be controlled by one signal. Relays were first used in long-distance telegraph circuits as signal repeaters: they refresh the signal coming in from one circuit by transmitting it on another circuit. Relays were used extensively in telephone exchanges and early computers to perform logical operations.

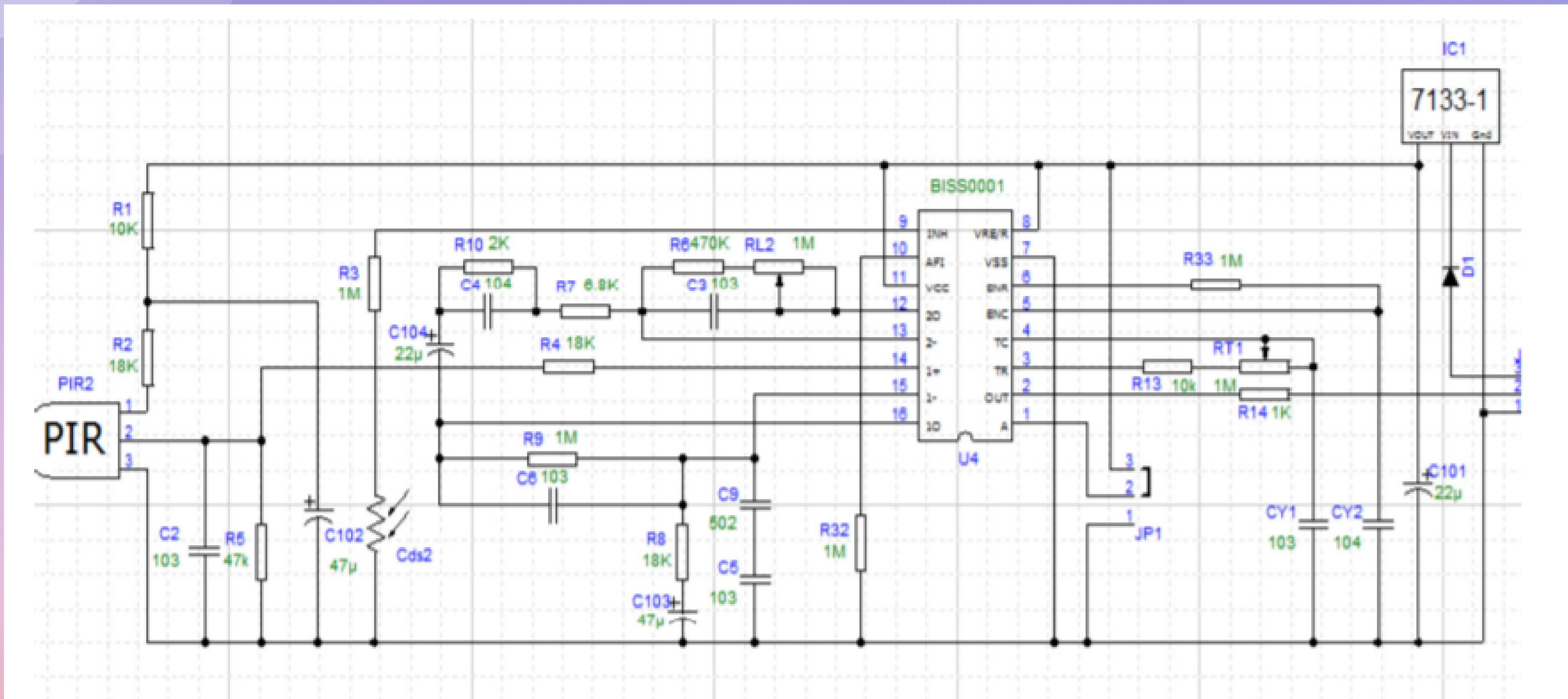


P.I.R MOTION SENSOR

PIR sensors allow you to sense motion, almost always used to detect whether a human has moved in or out of the sensors range. They are small, inexpensive, low-power, easy to use and don't wear out. For that reason they are commonly found in appliances and gadgets used in homes or businesses. They are often referred to as PIR, "Passive Infrared", "Pyroelectric", or "IR motion" sensors.

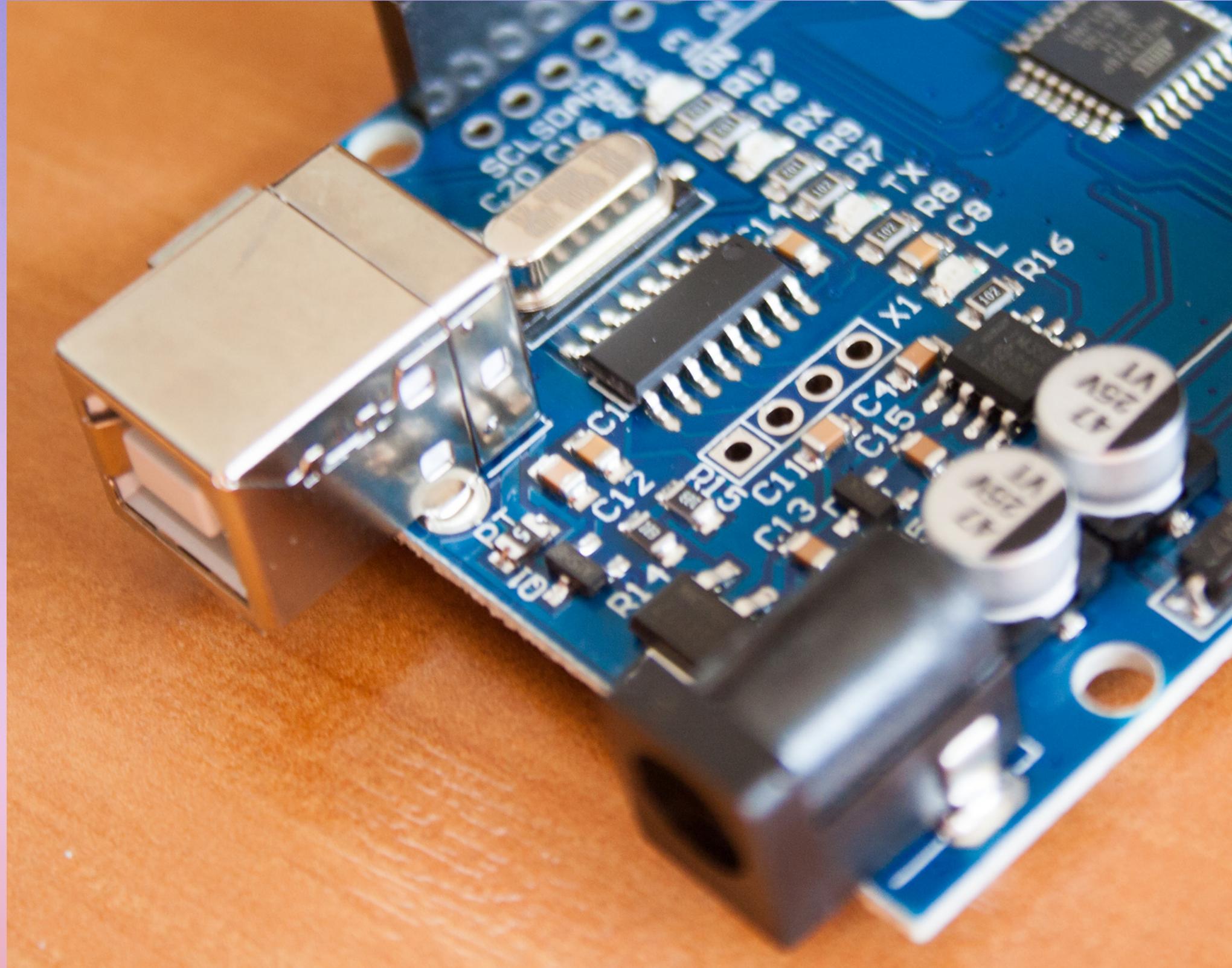


HC-SR501 PIR MOTION DETECTOR



ARDUINO

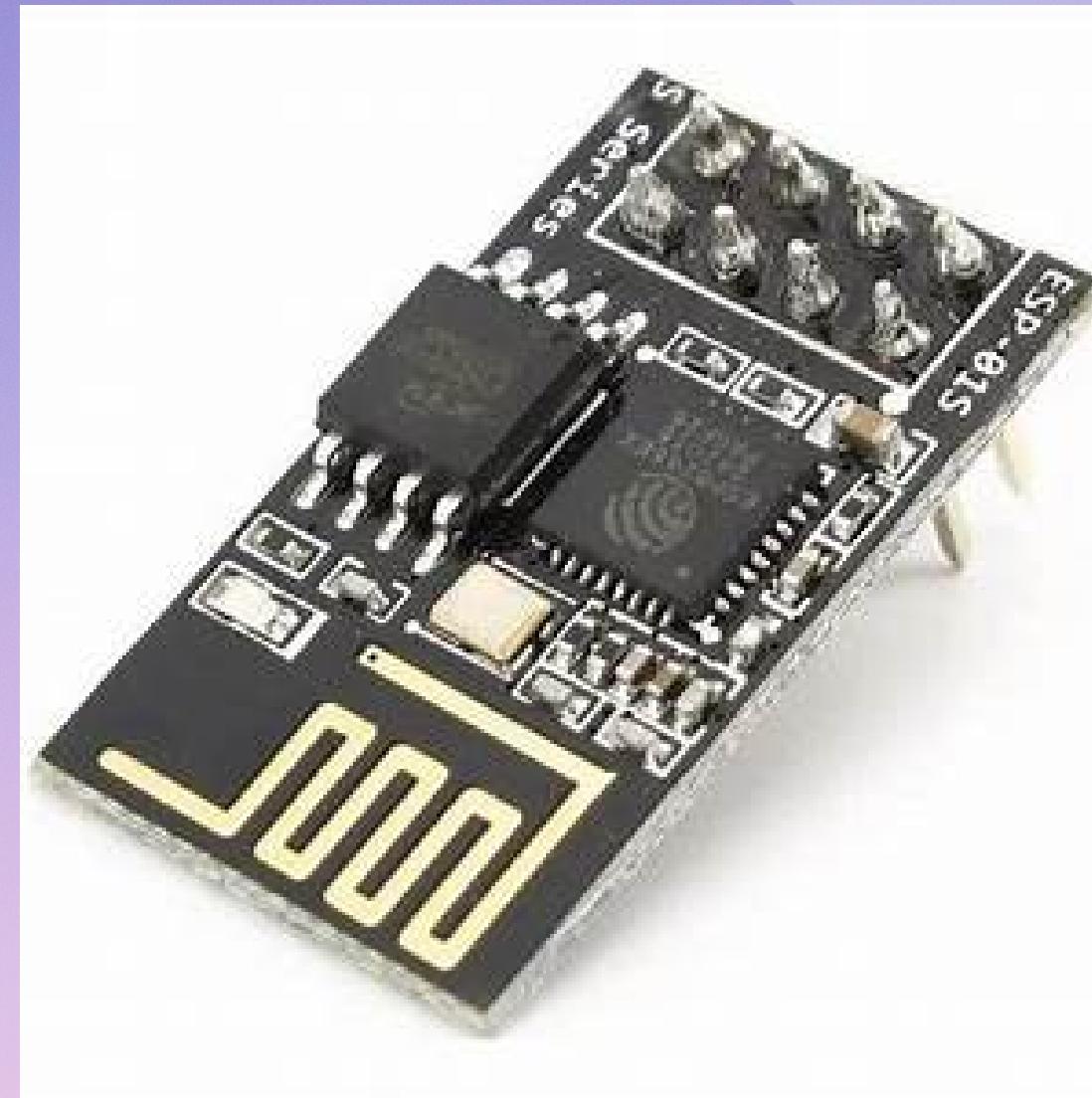
The Arduino board is used to read the input based on sensor, button, or finger or by twitter messages. It can be enabled by switching ON and OFF the led, sometimes it can be done online too. The board can be processed according to requirements by properly feeding the input data and set of instructions via a microcontroller.



ESP8266

The ESP8266 is a low-cost Wi-Fi microchip, with built-in TCP/IP networking software, and microcontroller capability, produced by Espressif Systems in Shanghai, China.

The chip first came to the attention of Western makers in August 2014 with the ESP-01 module, made by a third-party manufacturer Ai-Thinker. This small module allows microcontrollers to connect to a Wi-Fi network and make simple TCP/IP connections using Hayes-style commands. However, at first, there was almost no English-language documentation on the chip and the commands it accepted. The very low price and the fact that there were very few external components on the module, which suggested that it could eventually be very inexpensive in volume, attracted many hackers to explore the module, the chip, and the software on it, as well as to translate the Chinese documentation.



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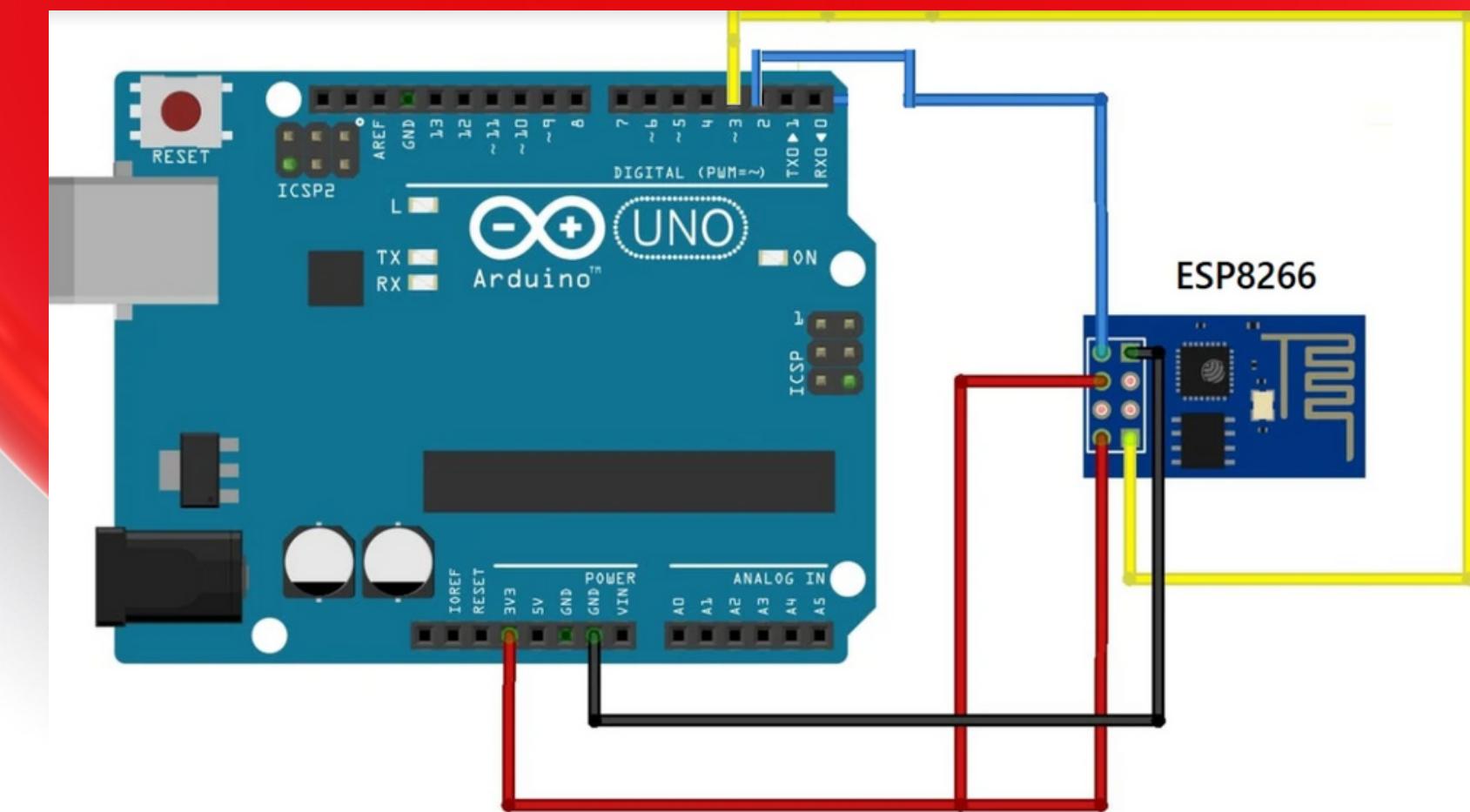
DATASHEETS

HC-SR501 P.I.R Motion
sensor

ESP8266 DATASHEET

Arduino DATASHEET

Relay DATASHEET





Future scope

In this project we have made it glow when the motion occurs but we have to set the street light to glow even the night and for that we require a LDR .Photoresistors work based off of the principle of photoconductivity. Photoconductivity is an optical phenomenon in which the material's conductivity is increased when light is absorbed by the material.

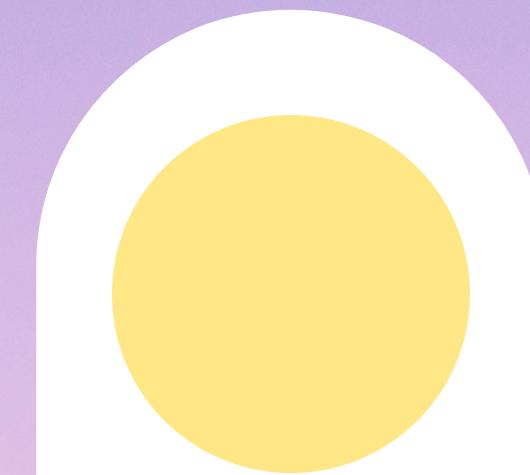
When light falls i.e. when the photons fall on the device, the electrons in the valence band of the semiconductor material are excited to the conduction band. These photons in the incident light should have energy greater than the bandgap of the semiconductor material to make the electrons jump from the valence band to the conduction band.

Hence when light having enough energy strikes on the device, more and more electrons are excited to the conduction band which results in a large number of charge carriers. The result of this process is more and more current starts flowing through the device when the circuit is closed and hence it is said that the resistance of the device has been decreased. This is the most common working principle of LDR . This is how we will complete our project so that it will glow in daylight and even in the night.

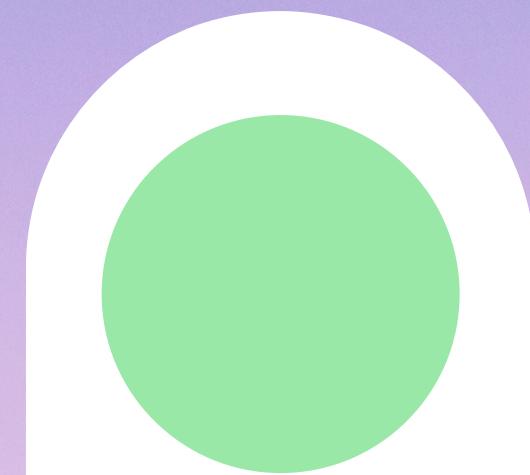
Steps How the streetlight will glow



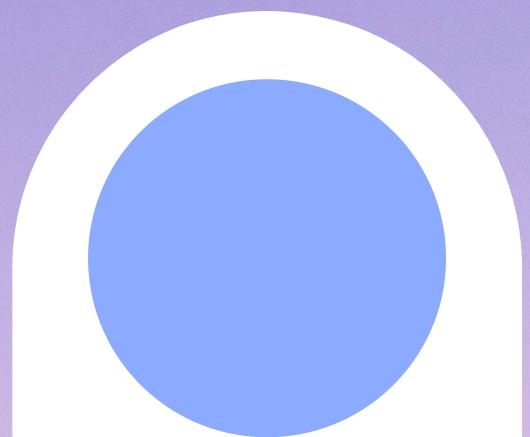
Step 1
IR sensor will sense
the motion and
will send to
arduino



Step 2
Arduino will send
the signal to
relay



Step 3
Relay will
let the
current to
flow



Step 4
This is how the
streetlight will
glow when the
motion happens

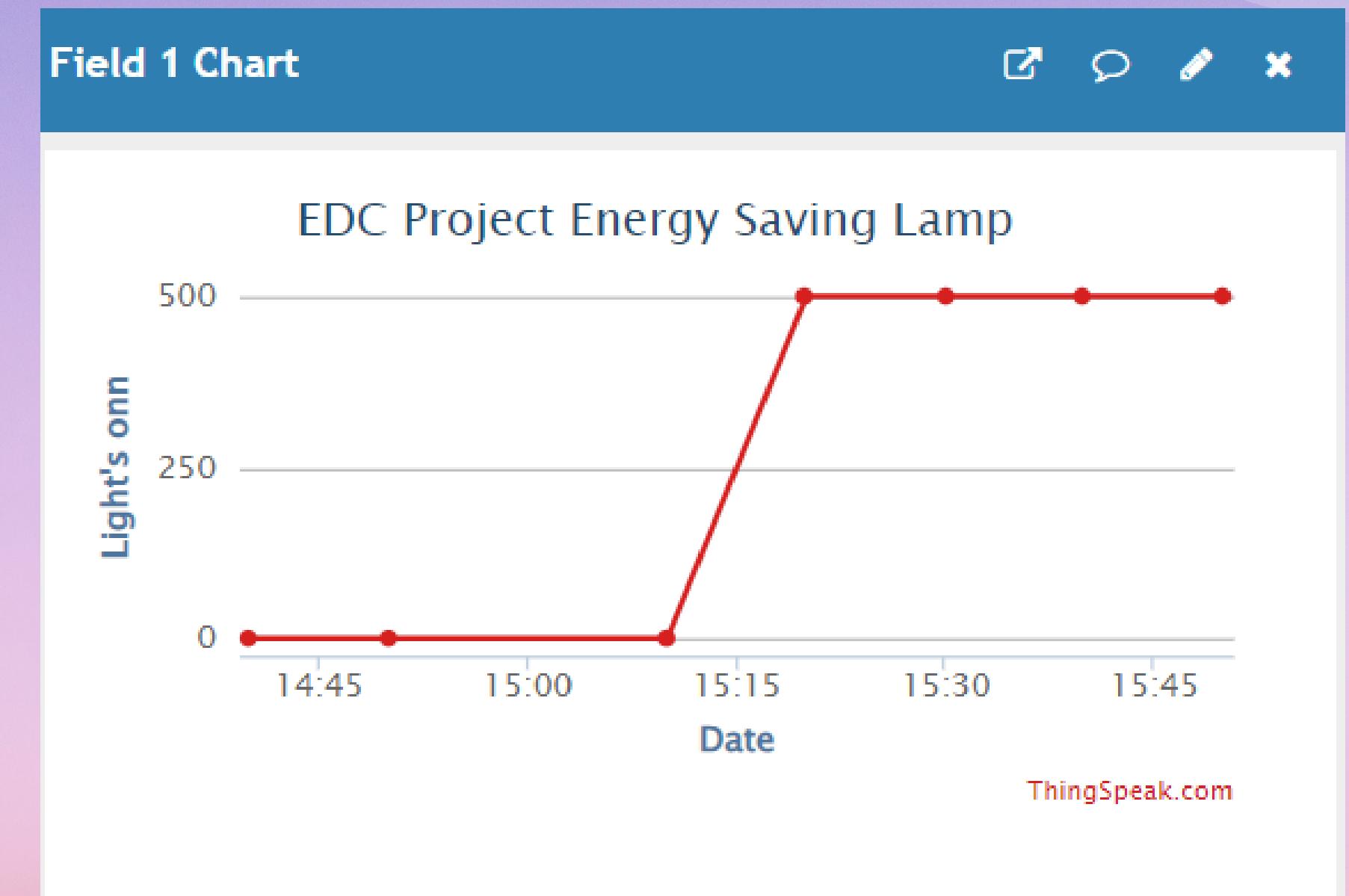


Graph obtained on Thingspeak.com

Link to our channel

Project channel

Innovatively Collecting DATA and plotting
it on a public Hosting site through ESP
8266 which can be seen by anyone



Thank You



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2k20/EE/171 2K20/EE/218 ::
The kingdom of heaven is like Electricity. You don't see ::
it. It is within You ::