CHAPTER 1

PROBLEM STATEMENT

This project focus on a real time situation where we are wasting the electricity. Because of our carelessness the usage of current is increasing day by day. We are living in an era where so many peoples do not getting electricity properly. Electrical power is now the backbone of modern industrial society. Electricity is at the heart of many modern technologies .In order to avoid the lack of electricity due to our carelessness we are implementing the new system that is known as Smart light which will automatically turn on or off. In this project, we are detecting the motion of a person or anything and turn off the light if there is no person. By this we can save the electricity. This will be very helpful to people for saving electricity and also provide safety to them. Outdoor illumination is wise way to keep all criminals at bay. The best way to do it is by getting motion sensor light that turn on when they detect movement. This may be the movement caused by a burglar or a family member returning home after dark in which case light provides not home defense , but helpful visibility

CHAPTER 2

INTRODUCTION

Nowadays, energy consumption is large in residential and business areas. it's due to the inefficient usage of electrical loads like heating systems, lighting systems etc. Among these, the lighting system is one in all the biggest energy overwhelming units of any building & structure. it's thus crucial to use the good lighting system by automatically switch on/off or dim the lights when required without troubling the conventional operation of the working atmosphere. Nowadays, energy consumption is large in residential and business areas. it's due to the inefficient usage of electrical loads like heating systems, lighting systems etc. Among these, the lighting system is one in all the biggest energy overwhelming units of any building & structure. it's thus crucial to use the good and efficient lighting system by automatically switch on/off or dim the lights when required without troubling the conventional operation of the working atmosphere. Different fields of lighting are business, residential, industrial and outside lighting. each of the sector has its own desires and necessities of lighting using completely different sensors. Residential sector wants to low power therefore low price easy solution will be used by using ambient sensors. Industrial lighting in retailers and offices uses bit high power, so they will create use of passive infrared sensors or super sonic sensors to cover massive areas. outside and Industrial sectors will create use of Pyroelectric Infrared(PIR), light and motion sensors so as to manage the light in a very safety and value effective manner.

CHAPTER 3

SYSTEM REQUIREMENTS

HARDWARE REQUIREMENTS:

MICROCONTROLLER:

SPECIAL FEATURES:

- Arduino UNO is a microcontroller board based on the ATmega328P.
- The operating voltage is 5V.
- The input voltage ranges from 6v to 20V.
- Digital input/output pins are 14 and Analog i/p pins are 6.
- DC Current for each input/output pin is 40 mA and Dc current for 3.3V Pin is 50 mA.
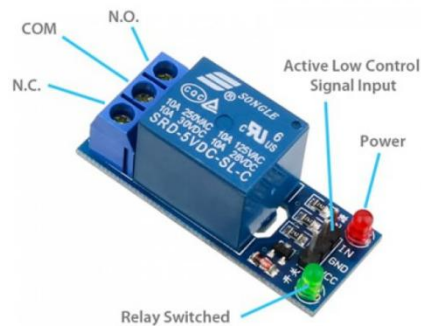
PIR SENSOR:

SPECIAL FEATURES:

- Power supply of 4.8V to 20V DC.
- Current less than 50μA.
- Logic Output 3.3V/0V

- Delay Time 0.3s-200s

- Lock Time 2.5 s

- Sensing Range less than 120°, within 7m

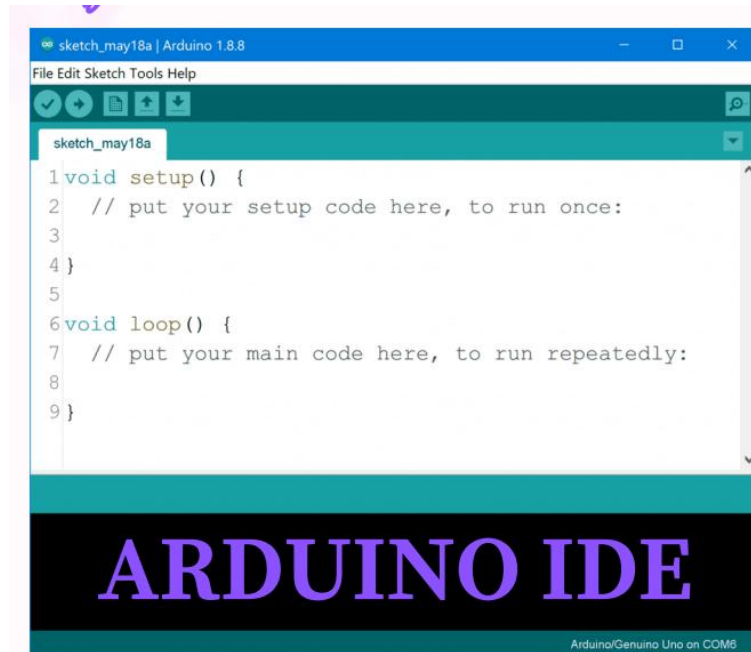- Temperature -15 to 70°C

RELAY MODULE:

SPECIAL FEATURES:

- Voltage upto 5V DC.

- Current 70mA

- Operating Time less than 10 ms

- Release Time less than 5 ms.

- Weight:13 gm

- Dimension: 38x26x18mm

SOFTWARE REQUIREMENTS:

Ardunio IDE (1.8.19 Version)

SPECIAL FEATURES:

➢ Arduino Integrated Development Environment (IDE) v1 - The Arduino Integrated Development Environment or Arduino Software (IDE) contains a text editor for writing code, a message area, a text console, a toolbar with buttons for common functions and a series of menus.

➢ It connects to the Arduino hardware to upload programs and communicate with them.

➢ Simple and easy to use, making it accessible to beginners and experienced developers alike.

➢ Comes with a large library of example sketches and libraries, which can be a great starting point for new projects.

➢ Has a strong community of developers and hobbyists, providing a wealth of resources and support.

➢ Compatible with a wide range of microcontroller boards, making it a versatile tool for different projects and applications.

CHAPTER 4

SYSTEM DESIGN

BLOCK DIAGRAM:
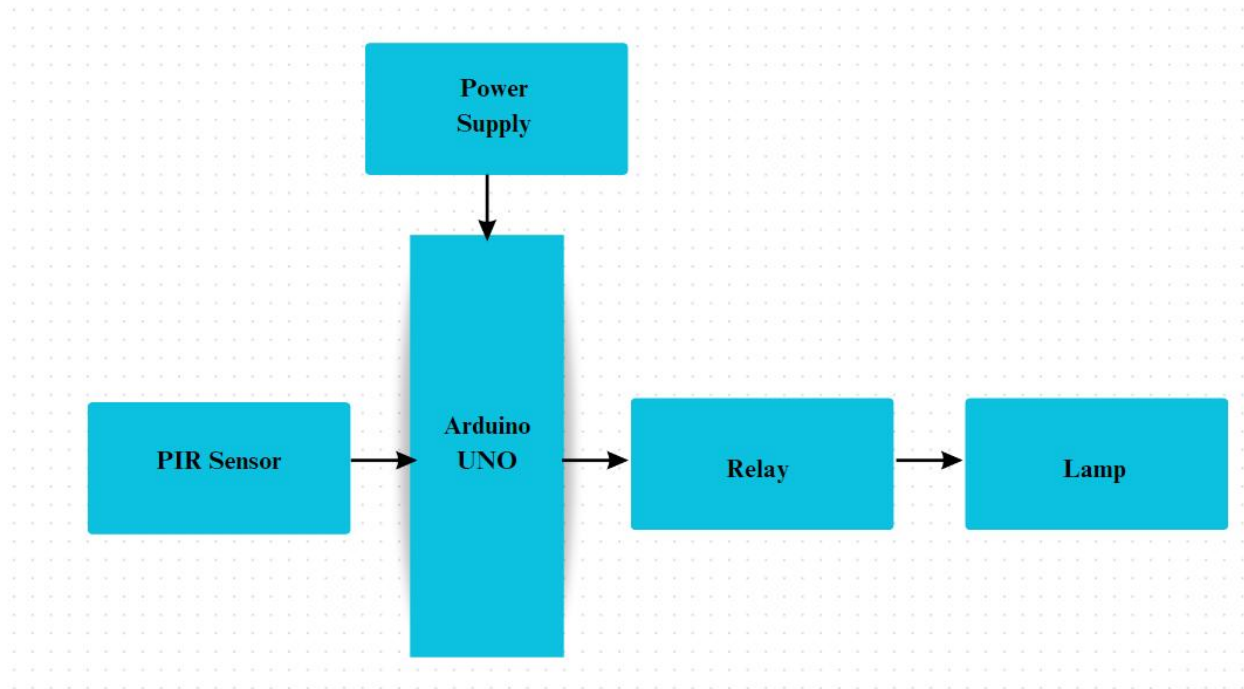
EXPLANATION:

The mechanism of PIR sensor to be able to turn on the light, it must be placed inside the room.In this actual setup of smart light and build the system by using Arduino. Starting with the mechanism to turn on or off the light ,for this purpose PIR Sensor has been used. It is placed inside the house.It is used to control the opening and closing of the circuit contacts of an electronic circuit that's why it is used here to control the smart light. The final step in the build process is to make the necessary connections using jumper wires as per the circuit diagram and securing these wires so that they don't hang around. All the wires from both the components i.e. PIR Sensor and Relay module are connected to respective pins of Arduino. This finishes up the build process of the Smart Light. In Arduino IDE Code has been uploaded, and with all hardware and software connection in Light. We will run our light, wait its working or not.
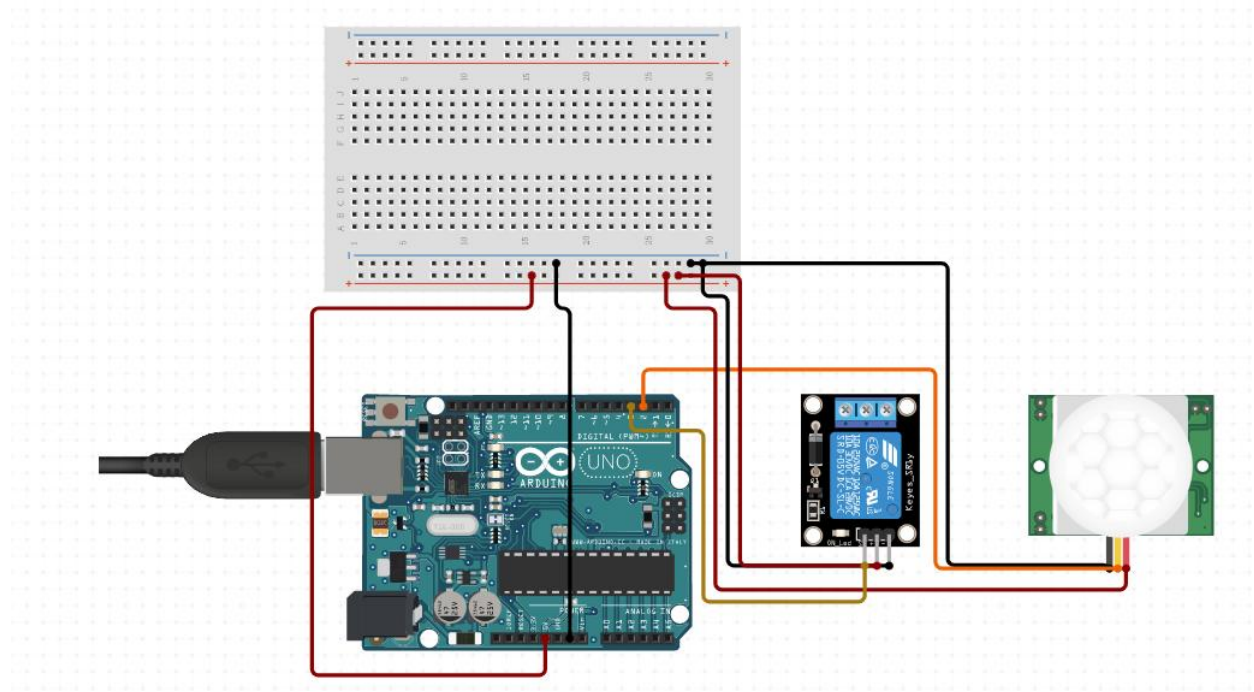
FLOWCHART:

Fir
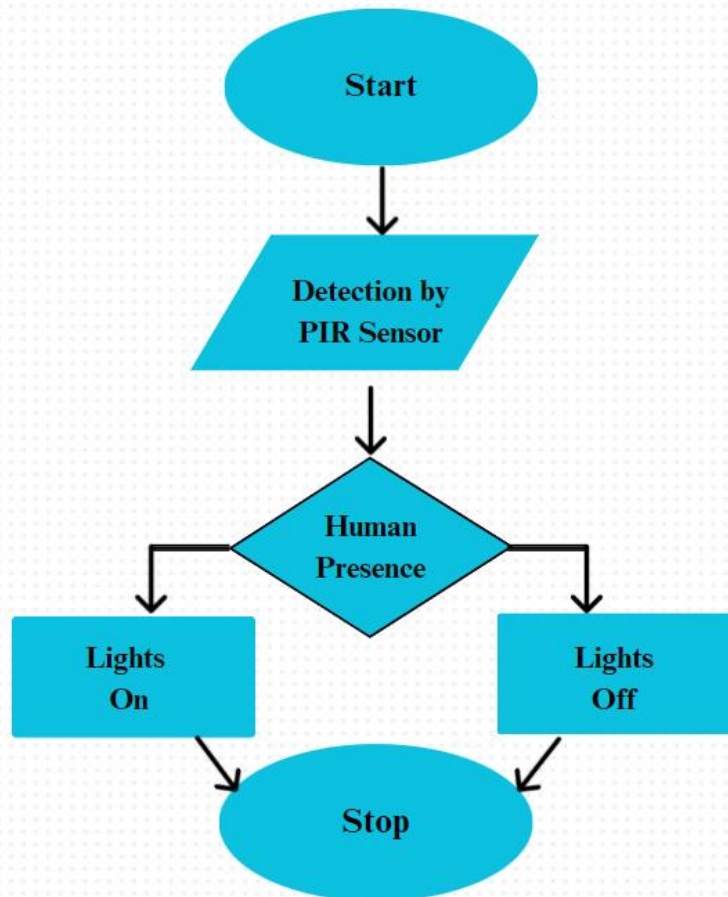
EXPLANATION:

   First, the people movement in the room is detected by the PIR sensor. If any movement is detected by the PIR sensor , then the bulb will detect the presence and gets turned on . If there is no movement detected then the bulb will gets off.

CIRCUIT DIAGRAM:

CHAPTER 5

IMPLEMENTATION

WORKING OF THE CIRCUIT:

Initially, when there is no human movement, the PIR Sensor doesn't detect any person and its OUT pin stays LOW. As the person enters the room, the change in infrared radiation in the room is detected by the PIR Sensor .As a result, the output of the PIR Sensor becomes HIGH. Since the Data OUT of the PIR Sensor is connected to Digital Pin 8 of Arduino, whenever it becomes HIGH, Arduino will activate the relay by making the relay pin LOW (as the relay module is an active LOW module).This will turn the Light ON. The light stays turned ON as long as there is movement in front of the sensor. If the person takes a nap or leaves the room, the IR Radiation will become stable (there will be no change) and hence, the Data OUT of the PIR Sensor will become LOW. This in turn will make the Arduino to turn OFF the relay (make the relay pin HIGH) and the room light will be turned OFF.

ARDUINO UNO CODE:

```
int Bulb = 8;     // intialising the bulb value
int PIR = 3;      // initializing PIR value
int val = 0;
void setup()
{ pinMode(Bulb, OUTPUT);
pinMode(PIR,INPUT); }
void loop()
{ val = digitalRead(PIR);  // Reading PIR value
if (val == HIGH)
{ digitalWrite(Bulb, HIGH); delay(200); } // Bulb glows
else
{ digitalWrite(Bulb, LOW); delay(200); } }
```

CHAPTER 6

RESULTS
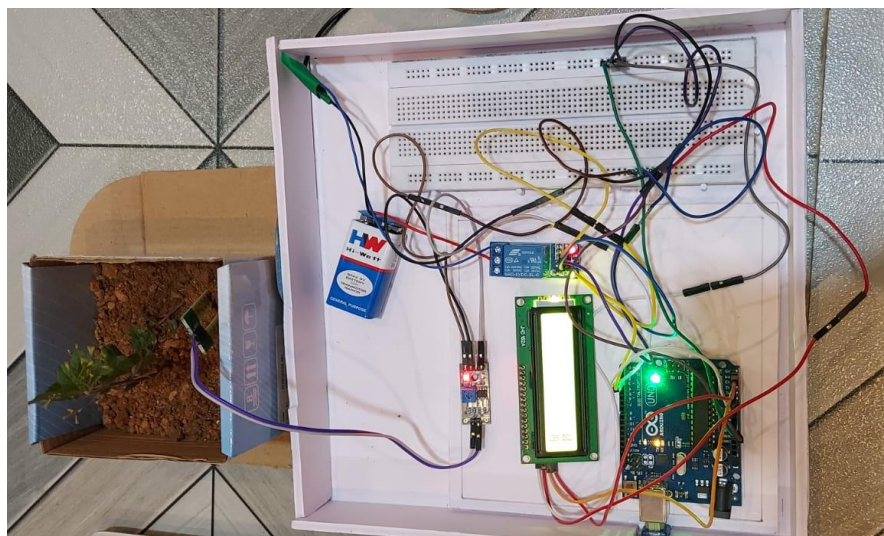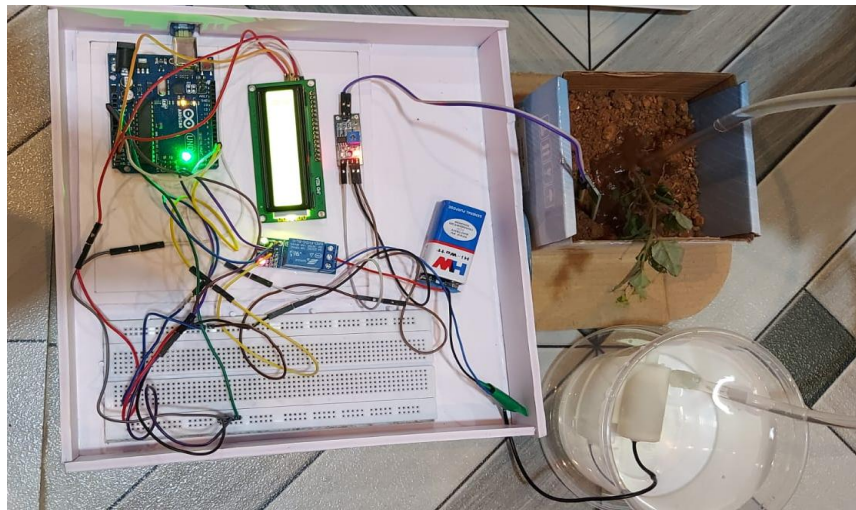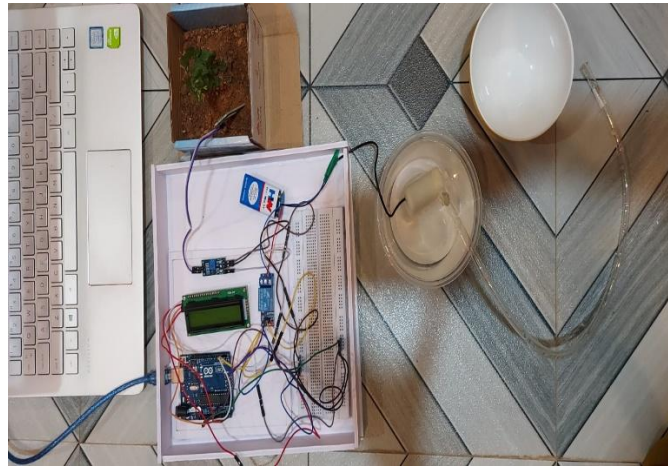
CHAPTER 7

CONCLUSION

FUTURE SCOPE:

It is not easy task to design this system using PIR sensors where PIR is generally used for the motion detection. We have done coding in such a way that little movement of the human body is detected by the sensor. We have made some time delay and adjusted the sampling period for the sensor output for the precise detection for this system. In the proposed system decision are taken based on presence of human but here we can also interface LDR (Light Dependent Resistor) along with PIR sensor for better working of the system.This system can also be interfaced with the Bluetooth module so the whole system can be controlled from the mobile by just single click. It can be used in college labs, schools, It can also be used in bathrooms, staircases, etc. in the house.

CHAPTER 8

REFERENCES

1. https://roboticadiy.com/motion-detection-automatic-light-on-off-with-arduino/

2. https://www.youtube.com/watch?v=lLk1T6JrRjQ