EEP 206 PROJECT REPORT

Title: Home Automation to switch off the lights when no person in a room.

Group members: Priyanka Kurkure (2015EEB1061)
Harshita Modi(2015CSB1012)

1. Introduction

Home automation or smart home is the residential extension of building automation and involves the control and automation of lighting. Our project is a prototype of one such automation. This project can be implemented on a larger scale to control the lighting of a room.

What actually automation means?

Automation refers to the ability to program and schedule events for the devices on the network. The programming may include time-related commands, such as having your lights turn on or off at specific times each day. It can also include non-scheduled events, such as turning on all the lights in your home when your security system alarm is triggered.

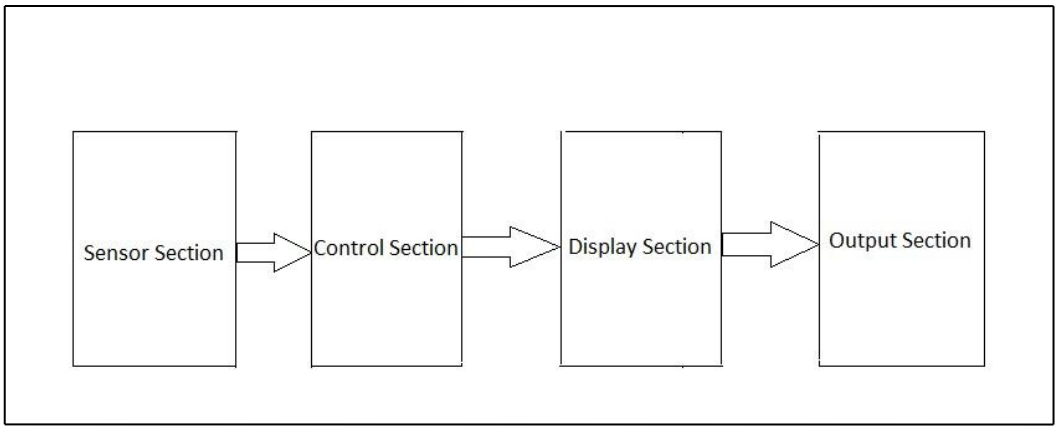
2. Motivation for the present work

Suppose a classrooom has a capacity of accomodating seventy people. This classroom will have atleast ten to fifteen lights and around eight to ten fans. Now let's consider that each of them consumes P watt/hr of power. So, total power consumed by the fans and lights will be PxN watt/hr.(where N is total number of fans and lights). Many times when students leave the classroom, they forget to switch off the lights and fans of the classroom. So PxNxt watt energy is wasted if the lights and fans are left on for t hours. Thus yearly loss of power due to this will be huge.

Hence, to conserve this power loss, we decided to design this simple circuit to control the switching action of fans and lights automatically.

3. Basic working (with block and circuit diagrams)

Our project basically senses people entering or exiting from the room. Whenever the first person enters the room the lights are automatically turned ON. It continues to glow till people are present in the room. Once the number of people in a room becomes zero, the lights and fans are automatically turned OFF.

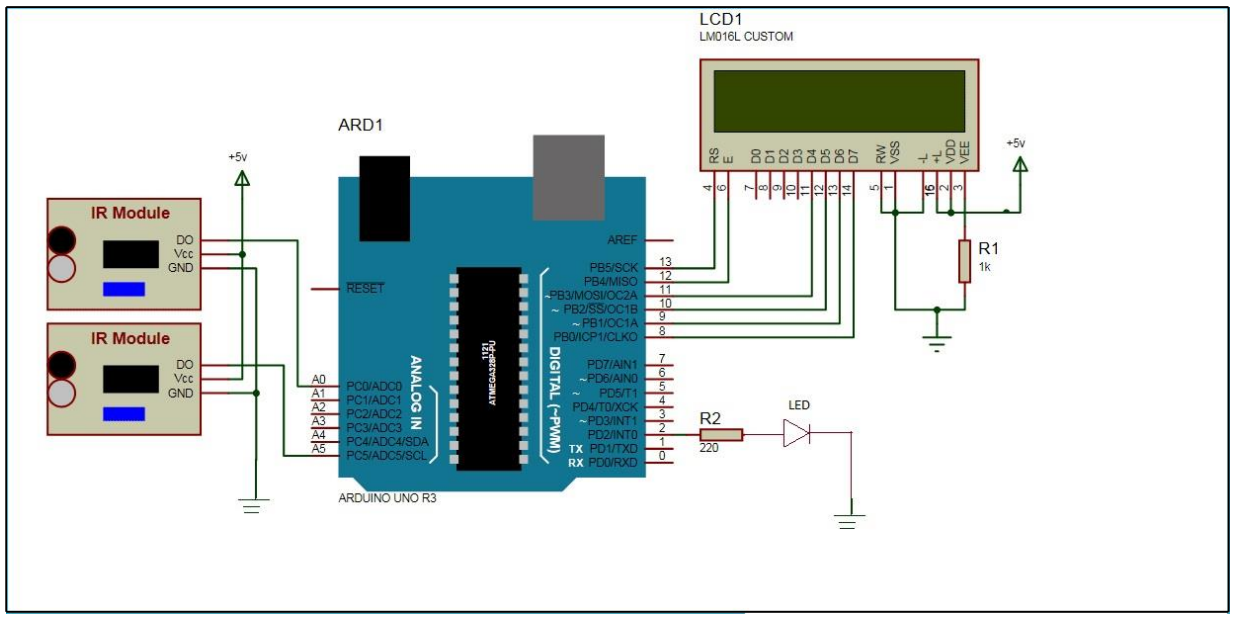


Block Diagram

Sensor Section: It contains two IR sensors which give the output as high when it detect the obstacles. We have used two IR sensors to differentiate between the people entering or exiting from the room. If the lower sensor detects an obstacle before the upper sensor, it indicates that the person has entered into a room else if the upper sensor detects the obstacle before the lower sensor, it indicates that the person has left the room. This information is then transferred to 'Control Section'.

*Control Section(Arduino):*The outputs of the sensor are fed as input to the control system. The count of number of people is increased or decreased depending upon the outputs of the 'Sensor Section'. Until count is greater than zero the output(LED) remains active and as soon as cont becomes 'zero' the output turns OFF.

Output Section: Output section contains an LED that turns ON or OFF depending on the output of 'Control Section'.



Circuit Diagram

```
#define in 14
#define out 19
#define relay 2
int count=0;
void setup(){
pinMode(in, INPUT);
  pinMode(out, INPUT);
  pinMode(relay, OUTPUT);}
void IN(){
     count++;
     delay(1000);}
void OUT(){
     count--;
    delay(1000);}
void loop(){
  if(digitalRead(in))
      IN();
  if(digitalRead(out))
      OUT();
  if(count<=0){
        digitalWrite(relay, LOW);
        delay(200); }
  else
        digitalWrite(relay, HIGH);
}
```

4. Applications

It can be used in many public places and educational institutions like schools, colleges, conference halls, lifts, etc. It will save a lot of energy and will prove to be a huge step towards development of country and will also prove helpful to preserve the resources.

5. Acknowledgements

We would like to thank all the people who helped us in successfully completing this project. Special thanks to **Dr. Rohit Sharma** for motivating us to think out of the box and continuously supporting us. We also thank the lab staff and teaching assistants for answering to all our doubts and queries and helping us in analyzing the circuit.

6. References

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[4] https://www.arduino.cc/en/Reference/Delay