Automated Home Management

A Brief Description :

In this project we've tried to show a prototype how we can make our home automated using micro controller and some other controlling devices. This project will also help to reduce the wastage of energy. The lights and fans of a room will be automatically on if anyone enters the room. If there is no one in the room and one of the lights and fans are on,it will automatically turn off. We will also provide options for turning on/off the lights and fans using android phone via blue-tooth module.

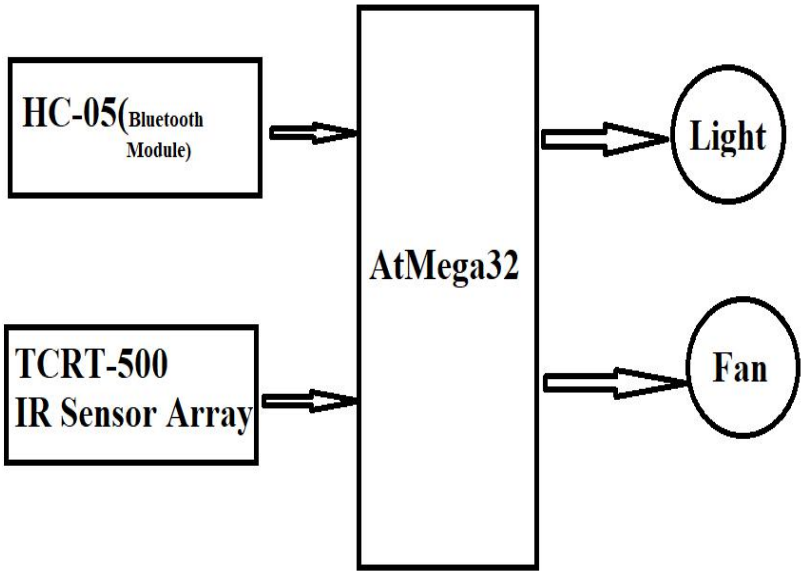
Required Equipments :

1. ATMega-32A
2. HC-05 Blue-tooth Module
3. Digital TCRT-500 IR Sensor Array04
4. 4 Channel Relay

How It Works :

When an obstacle comes in front of the TCRT-500 IR sensor,it changes its level to logic 1 from logic 0.when the obstacle removes,it again gives logic 1 output.Using three of these sensors we detected the direction of the motion of a person.If the direction of motion is towards the room,we increment the counter by 1,and if the direction is towards the outside,we decrement the counter.Initially when the counter is 1 of a room,using the
relay we turn on the light of that room.While the counter of a room is non-zero,we can on-off the light and the fan of that using our smart phone.If we press a specific button,a specific value is sent to the HC-05 blue-tooth module.After receiving the value the module pass it to the micro-controller.Analysing the value the micro-controller decides which light/fan of which room is to turn on/off.Controlling via blue-tooth will work until the people counter of a room is greater than 0.If everyone leaves the room,which means the counter is 0,the micro-controller will automatically turn of all the lights and the fans of that room.The output of the micro-controller is directly connected to the relay.When the output is 1,the relay gives power to the light
or fan it is connected with from the main power line.When the output is zero,the relay turns off the power.

Block Diagram :



Algorithm :

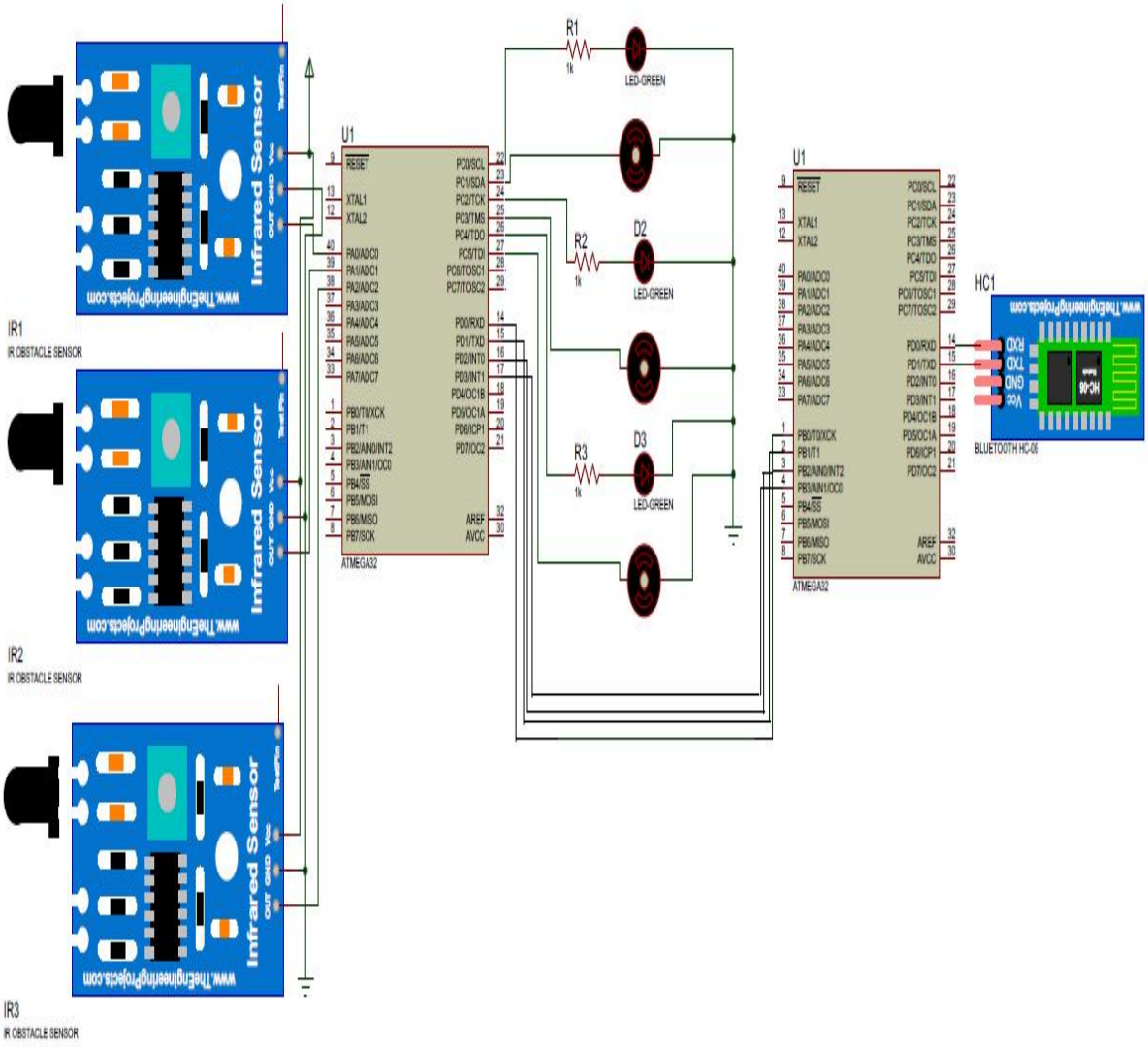
1. Start.
2. Initialize a counter with zero.
3. If anyone enters the room, increment the counter.
4. If anyone leaves the room, decrement the counter.
5. If the counter is not equal to zero

6. Turn on the light and the fan (if the corresponding blue-tooth signal is on.)

7. Turn off the light and the fan (if the corresponding blue-tooth signal is off.)

8. If the counter is equal to zero, turn off the light and the fan of the room.
9. End.

Detailed Pin Diagram :



Problems Faced :

1. At first the DC motors used as fans were not getting enough voltage to operate. Using Li-po Battery solved the issue.

2. Often the wires were found faulty and we had to put a lot of time to figure out the faulty one and replace it.

3. The Blue-tooth Module was not working properly at the beginning and was receiving unrecognised characters instead of the on/off signal from the mobile app. Atmega speed was made from 1MHz to 8 MHz by fusing bit, then blue-tooth worked properly.

4. The 4 channel relay was not working fully as all of the channels were not working at a time at first. Later we got rid of this problem and managed to work with all the channels together.

Group Members Information :

Section B2
Group-05
1. Akid Abrar(1605100)
2. Tasnim Doha(1605108)
3. Md Minhazul Haque Fahim(1605117)

Course Teachers :

1. Md. Tareq Mahmood
   Lecturer, CSE, BUET

2. Md. Masum Mushfiq
   Lecturer, CSE, BUET