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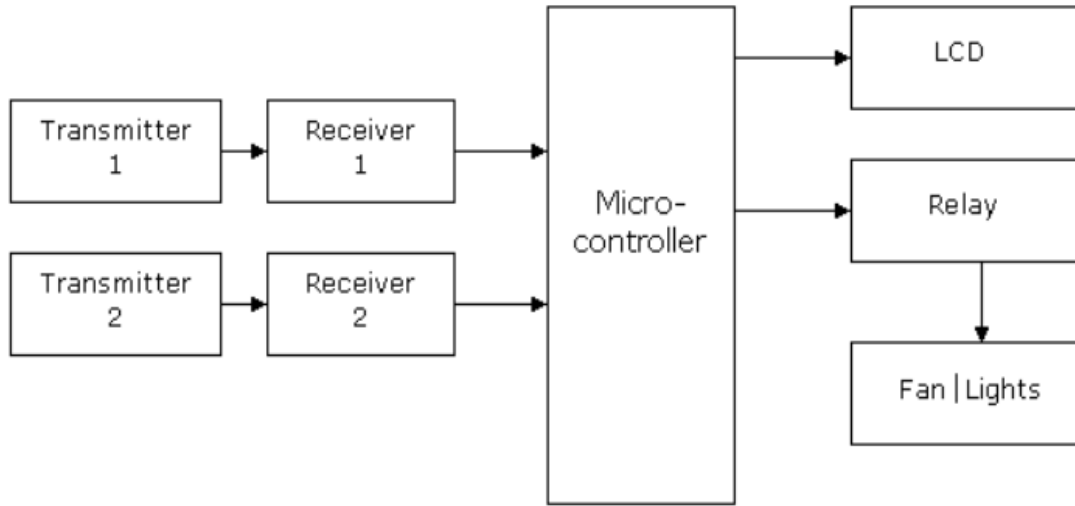
**SYNOPSIS FOR
AUTOMATIC ROOM LIGHT CONTROLLER CUM
BIDIRECTIONAL VISITOR COUNTER**

INTRODUCTION

In today's world, there is a continuous need for automatic appliances. With the increase in standard of living, there is a sense of urgency for developing circuits that would ease the complexity of life. Many times we need to monitor the people visiting some place like shopping mall. To provide solution for this I am going to implement a project called "Bi Directional Digital Visitor Counter" with automatic room light control. This project has a "Visitor counter". Basic concept behind this project is to measure and display the number of persons entering in any room like seminar hall, conference room etc. LCD displays number of person inside the room. We can use this project to count and display the number of visitors entering inside any conference room or seminar hall. This works in a two way. That means counter will be incremented if person enters the room and will be decremented if a person leaves the room. In addition, it will automatically control room lights. When the room is empty the lights will be automatically turn off. Digital Visitor Counter bidirectional visitor counter In today's world, there is continuous need automatic appliance will be increase in standard of living, there is a sense of urgency for developing circuit that would ease the complexity of life. Also if someone wants to know the number of persons present in a room so as not to have congestion, the circuit proves to be helpful. The theme of this project when merged with certain established technologies can be quite effective in number of countries like Germany, France & Japan etc. This Project is useful in developing countries and this project has a bright future. This project helps us to control the light of a room automatically and counts the number of persons/visitors entering and leaving the room. By using this circuit and proper power supply we can implement various applications such as fans, tube lights, etc.

Main concept behind this project is to measure and display the number of persons entering in any room like seminar hall, conference room. And when number of persons inside the room is zero, power supply inside the room can be cut using a relay interface. This will help to save electricity. LCD display placed outside the room displays number of person inside the

BLOCK DIAGRAM





REQUIREMENTS

HARDWARE

- Arduino Nano
- LCD 16x2
- IR module
- 5V Relay
- Transistor BC548
- Resistor 220ohm
- 1N4007 diode
- LEDs
- 7805 voltage regulator IC
- Female connector strip
- Printed circuit board
- PCB mounted screw socket
- Main lead
- 9V -12V DC SMPS supply

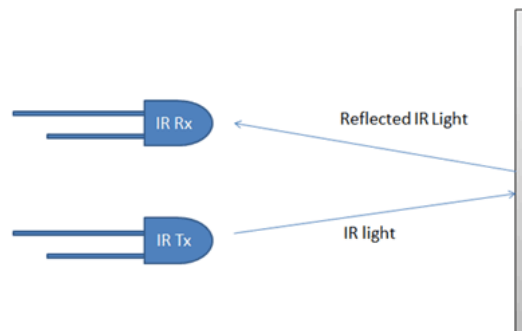
SOFTWARE

- Arduino IDE
- Express PCB
- Fritzing

CIRCUIT EXPLANATION

The project of “**Bidirectional visitor counter**” is based on the interfacing of some components such as sensors, LCD etc with Arduino microcontroller.

This project is divided in four parts: **Sensors**, **Controller**, Display and **Load Controller (Relay)**. The sensor would observe a reflected signal and provide an input to the controller which would run the counter increment or decrement depending on entering or exiting of the person. And counting is displayed on a 16x2 LCD through the controller.



Sensor section: In this section we have used two IR sensor modules which contain IR diodes, potentiometer, Comparator (Op-Amp) and LED's. Potentiometer is used for setting reference voltage at comparator's one terminal and IR sensors sense the object or person and provide a change in voltage at comparator's second terminal. Then comparator compares both voltages and generates a digital signal at output. Here in this circuit we have used two comparators for two sensors. LM358 is used as comparator. LM358 has inbuilt two low noise Op-amp.

Control Section: Arduino Nano is used for controlling whole the process of this visitor counter project. The outputs of comparators are connected to digital pin number of arduino. Arduino read these signals and send commands to relay driver circuit to drive the relay for light bulb controlling.

Display section: Display section contains a 16x2 LCD. This section will display the counted number of people and light status when no one will in the room.

Relay Driver section: Relay driver section consist a BC547 transistor and a 5 volt relay for controlling the light bulb. Transistor is used to drive the relay because arduino does not supply enough voltage and current to drive relay. So we added a relay driver circuit to get enough voltage and current for relay. Arduino sends commands to this relay driver transistor and then light bulb will turn on/off accordingly.

APPLICATION AND ADVANTAGE

- Can be used in various rooms like seminar hall, where the capacity of room is limited and should not be exceeded. Project will display the actual number of persons inside the room.
- Can be used in conference room, study rooms in colleges

FUTURE DEVELOPMENT

- We can send this data to a remote location using mobile or internet
- Voice alarm system can be added to indicate that room is full & persons can't enter inside

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