HINDUSTAN
INSTITUTE OF TECHNOLOGY & SCIENCE
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Bidirectional Visitor counter using Arduino

Name of student & Register Number

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DESIGN PROJECT

ABSTRACT

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 we are 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 people 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 prove 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

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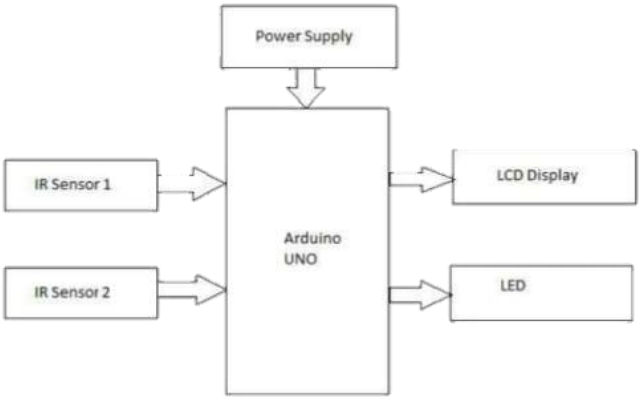
1. Introduction

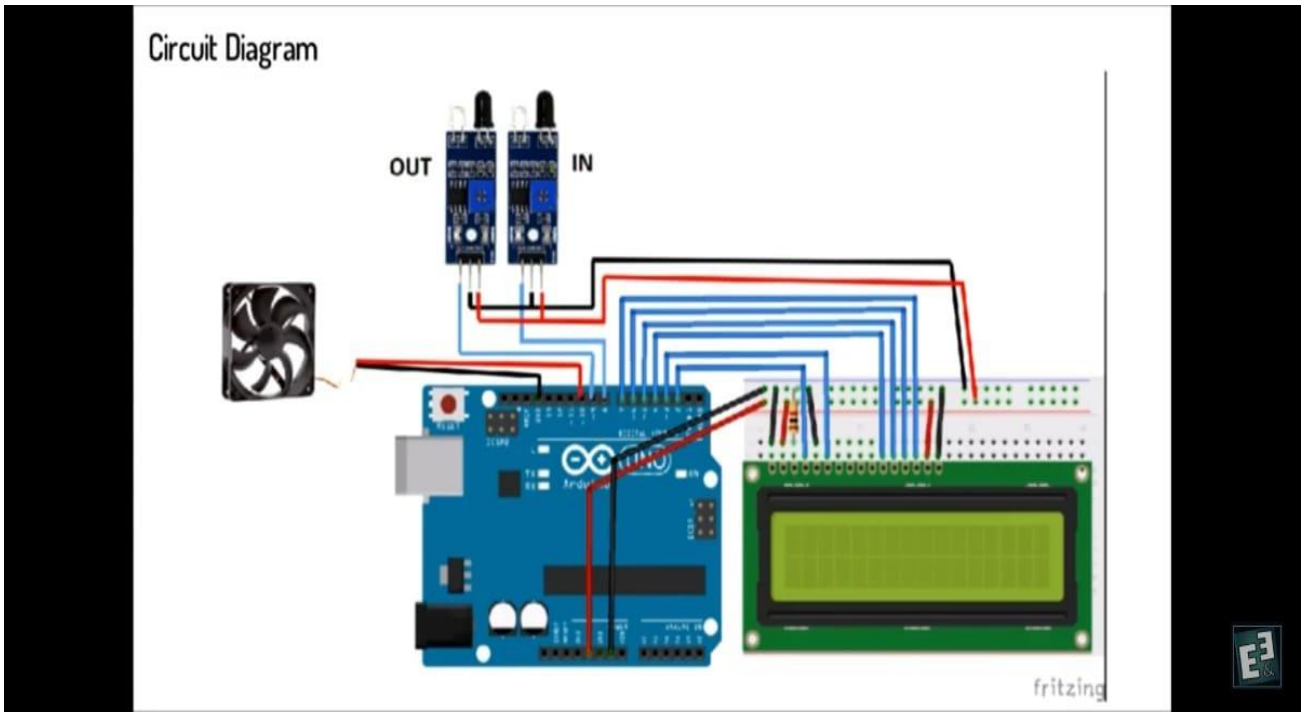
In this project, we will make a Bidirectional Visitor Counter with an Automatic Light Control System using Arduino. This project is based on a pair of Infrared Sensor that detects interrupt when it detects an obstacle. The pair of IR sensors can detect the visitor from both directions, i.e., the number of entering visitors and the number of exiting visitors. This Arduino Bidirectional Visitor Counter Project can be used to count the number of persons entering a hall, Shopping mall, office, functions in the entrance gate. It can also be used at gates of parking areas and other public places. The device counts the total number of people entering through the gate and also the total number of people leaving through the same gate. And finally, it counts the total number of people currently present inside the room. When no people are inside the room, i.e., the total number of people is zero then the room light is turned off. When even a single person is found inside the room, the light turns on. The light control system is automatic based on the visitors' presence.

2. BLOCK DIAGRAM



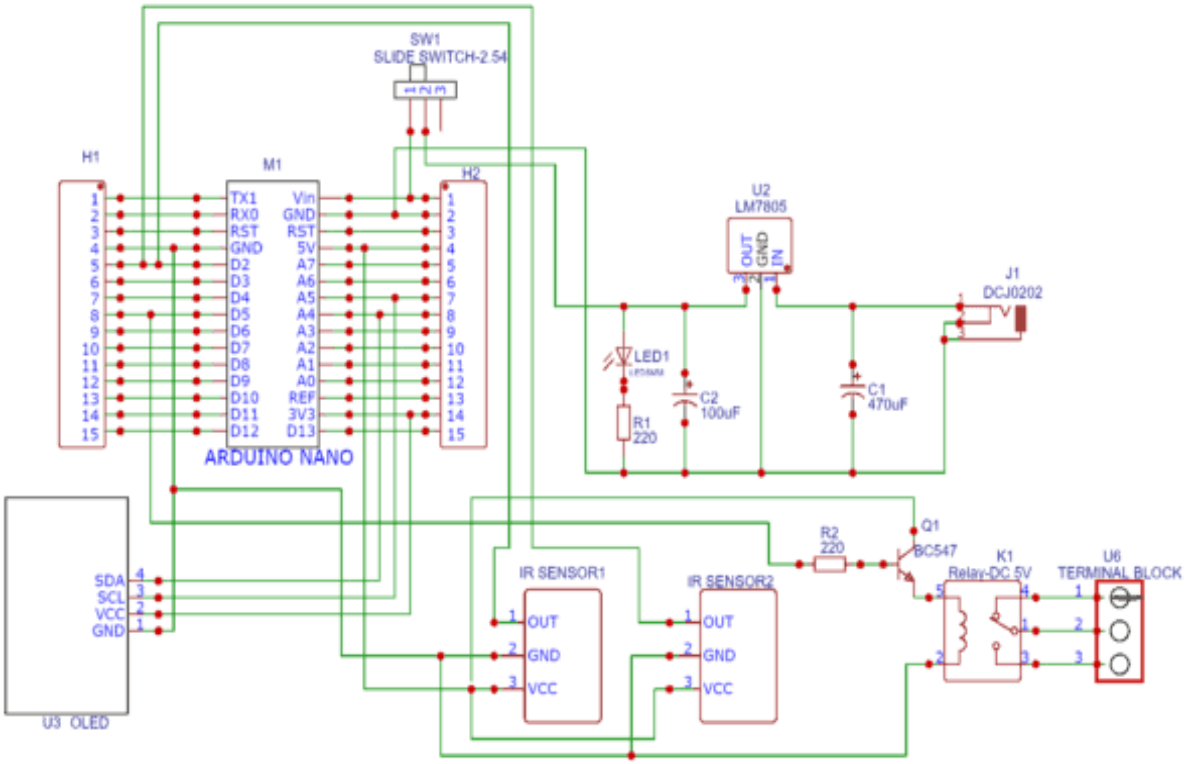
BLOCK DIAGRAM OF BIDIRECTIONAL VISITOR COUNTER USING ARDUINO

3. CIRCUIT DIAGRAM



BIDIRECTIONAL VISITOR COUNTER USING ARDUINO

CIRCUIT DIAGRAM



BIDIECTIONAL VISITOR COUNTER USING ARDUINO

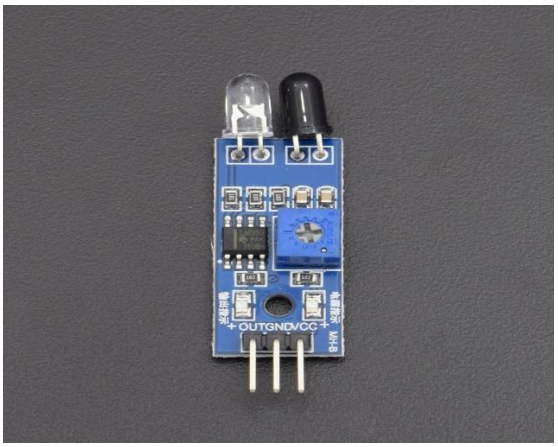
4.COMPONENTS REQUIRED

SI.NO	Components Required	NO.
1.	Arduino UNO	1
2.	IR Sensor	2
3.	5V DC Motor	1
4.	Resistor (10K)	1
5.	Breadboard	1
6.	16*2 LCD Display	1
7.	12v power supply	1

1. ARDUINO UNO

The Arduino Uno is an open-source microcontroller board based on the Microchip ATmega328P microcontroller and developed by Arduino.cc. The board is equipped with sets of digital and analog input/output (I/O) pins that may be interfaced to various expansion boards (shields) and other circuits.

2. IR SENSOR



An infrared sensor (IR sensor) is a radiation-sensitive optoelectronic component with a spectral sensitivity in the infrared wavelength range 780 nm ... 50 µm. IR sensors are now widely used in motion detectors, which are used in building services to switch on lamps or in alarm systems to detect unwelcome guests.

3. 5V DC Motor

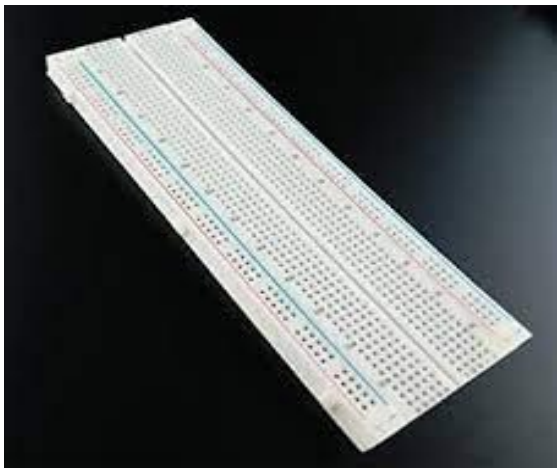
DC motors are rotary electrical machines that convert electrical energy into mechanical energy (Rotation). SPECIFICATION. Speed: 2000RPM. Voltage: 5V.

4.RESISTOR (10k)

This Resistor controls the collector current passing in the transistor and affects the bias point. So according to the specific amplification (GAIN) the designer wanted has chosen this

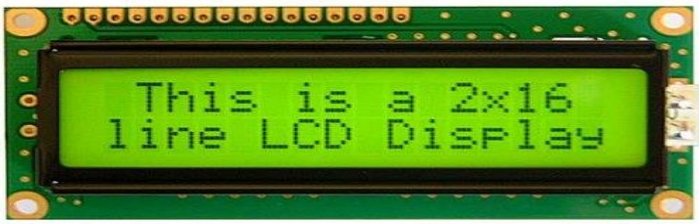
resistor to be 10k using the basic transistor equations.

5.Breadboard



A breadboard is a rectangular board with many mounting holes. They are used for creating electrical connections between electronic components and single board computers or microcontrollers such as Arduino and Raspberry Pi. The connections aren't permanent and they can be removed and placed again.

6.16*2 LCD Display



A 16x2 LCD means it can display 16 characters per line and there are 2 such lines. In this LCD each character is displayed in 5x7 pixel matrix. The 16 x 2 intelligent alphanumeric dot matrix display is capable of displaying 224 different characters and symbols. This LCD has two registers, namely, Command and Data.

7.12V Power Supply

12 Volt Adapter Power Supplies then have an attached output cord that plugs into your equipment. Our 12 Volt Adapters are available with output power ranging from under 10 Watts to over 60 Watts. It is used to power the Arduino.

12. MERITS

1) This model can be implemented as an automated switch to increase energy efficiency.

2) The model can be applied at the entrance of a room to operate the lights and other appliances

13. DEMERITS

1)If there are multiple doors for the same room the project becomes quite complex.

2)IR sensor cannot detect if lots of people are entering at one time.

14. RESULT

After uploading the visitor counter code to Arduino Board, the device is ready for installation. You can use a 5V DC Adapter to Power on the Device.
The device has a pair of IR Sensor module. One of the IR Sensors needs to be placed at the entrance and the other at the exit, i.e., inside the room door and outside the room door.

When no visitors are inside the room, the light turns off and the LCD Display will indicate no visitors are present inside the room.

When a person leaves the room or exit, the visitor is subtracted. Hence the total number of current visitors is displayed on LCD. The LCD Display also displays the number of visitors who visited the room and the number of visitors who exit. This is how an Arduino Visitor Counter with Light Control System works. You can use this project for Hall, Schools, Office, Functions, etc.

15. CONCLUSION

The Arduino controlled Bidirectional Digital visitor counter is a consistent circuit which is mainly designed to monitor the room appliances as well as count number of people entering in the arena very accurately and also avoids congestions in the different areas of usage.

16. Future Scope

1. Lights can be turned ON/OFF according to the number of people in the room.
2. We can check the ambient light intensity and then decide if the light needs to be turned ON or not.
3. Metal detector can be added for security reasons.