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Bidirectional Visitor Counter

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ABSTRACT:

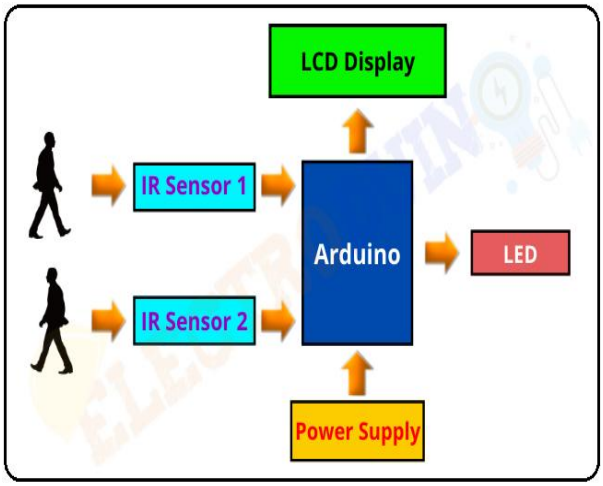
This project describes a circuit which is used for controlling the room lights according to the count of persons in the room and simultaneously works as a security system when the camera is attached. When somebody enters into the room then the counter will be incremented accordingly the LED light in the room will be switched ON and when any one leaves the room then the counter will be decremented. The light will be only switched OFF when the room is vacant. The number of the LED lights will be ON according to the total number of persons inside the room and the count will be displayed.[2]

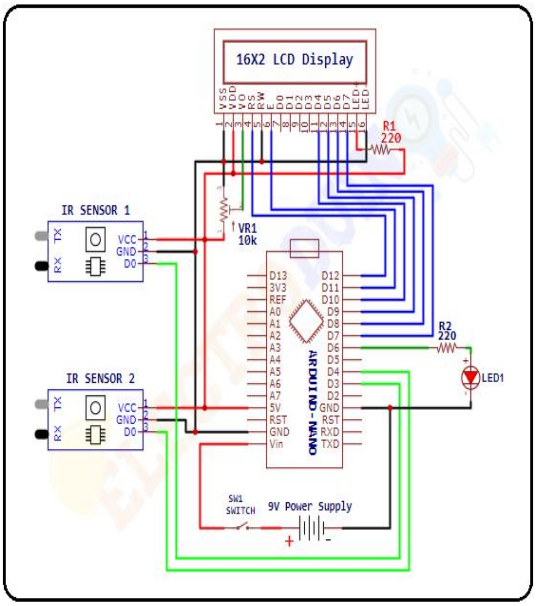
Keywords— LED, Arduino, Infrared, IR Sensor, Security system.

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 we am going to implement a project called "Bi Directional DigitalVisitor Counter" withautomaticroomlightcontrol. 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 displaythe 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.Motivation A few days back, we organized a seminar in Pearl Continental, Conference Hall. Main issues we faced were that firstly, few people were trapped inside hall and security guards closed conference rooms after finishing seminar, because they (security guards) were unaware of total number of people inside hall. Moreover, we couldn't analyse the feedback of people and number of people attending the seminar as there wasn't any registration process. Lastly, after ending of seminar, electrical appliances such as Air coolers and fans were left unattended, this caused electricity wastage. All these problems gave me perspective that if we could somehow analyse the number of people entering and leaving halls, these drawbacks could be avoided. This promoted the idea of Bidirectional Visitor Counter in our mind through which we can keep a check on number of people and allow all people to leave any building before sealing it. We can also count number of people to analyse the feedback of people on any event. And most importantly, in case of all people leaving a premise, all electrical appliances will be turned off automatically leading to saving of electricity.[1]

Block Diagram





Working Principle

First of all, we need to set one IR sensor (IR sensor-1) at the entry gate and another one (IR sensor-2) set at the exit gate. Normally when IR sensors do not detect any obstacle, it produces a HIGH (1) output value from the Output Pin.

When a visitor enters through the entry gate the IR sensor-1 detects the visitor (obstacle) and produces a Low (0) output value from the Output Pin. Then the Arduino read this value and counts 1+ using the code. Similarly, When the IR sensor-1 detects another visitor (obstacle), the Arduino increment the counting by 1+. In this way every time the Arduino adds +1 in the count when a visitor passes through this gate and calculates the total number of entering visitors.

In the same way, when a visitor leaves through the exit gate the IR sensor-2 detects the visitor (obstacle) and produces a Low (0) output value from the Output Pin. Then the Arduino read this value and counts 1+ using the code. Similarly, When the IR sensor-2 detects another visitor (obstacle), the Arduino increment the counting by 1+. In this way every time the Arduino adds +1 in the count when a visitor passes through this gate and calculates the total number of exiting visitors.Every time Arduino Subtracts the total number of entering visitors from the total number of exiting visitors to calculate the total number of visitors currently present inside the place.

After counting and calculating all numbers the Arduino sends data to the 16×2 LCD Display. The LCD Display shows the total number of entering visitors, the total number of exiting visitors, and the total number of visitors currently present inside the place. The LED starts glowing when no one is present inside that place.[3]

Applications:

1.This project can be used in seminar halls and classrooms.
2.This project can also be used in industries, offices, public places[5]

Advantages:

1. No need of human intervention.
2. Can work 24x7 without any problem.
3. Low cost and very easy to implement.

Future Scope:

- We can interface a GSM modem to send this data through SMS.
- Lights can be turned ON/OFF according to the number of people in the room.
- We can check the ambient light intensity and then decide if the light needs to be turned ON or not.
- Metal detector can be added for security reasons.[6]

Conclusion:

This project describes a circuit which is used for controlling the room lights according to the count of persons in the room and simultaneously works as a security system when the camera is attached. When somebody enters into the room then the counter will be incremented accordingly the LED light in

the room will be switched ON and when any one leaves the room then the counter will be decremented. The light will be only switched OFF when the room is vacant. The number of the LED lights will be ON according to the total number of persons inside the room and the count will be displayed. [5]

References

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