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Automatic Room Light Controller using Bi-Directional Visitor Counter

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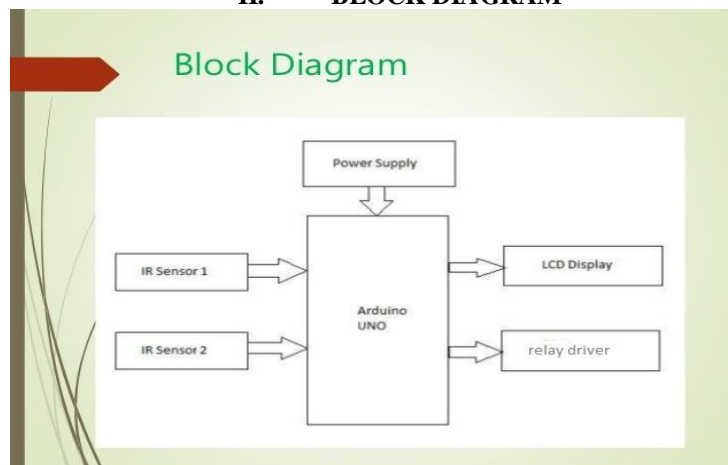
Abstract: Wastage of electricity is one in every of the most issues that we tend to face now-a-days. In our home, school, schools or business we tend to see that fan/lights area unit unbroken on albeit there area unit no one within the area or area/passage. This happens thanks to negligence or as a result of we tend to forgot to show lights off or after we area unit in hurry. To avoid all such things we've designed this project known as "Automatic room light controller using bi-directional visitor counter". the most conception behind this project is understood as "Visitor counter" that measures the amount of persons getting into in any area like seminar hall, room, classroom. This operate is enforced employing a try of Infrared sensors. liquid crystal {display/LCD/digital display/alphanumeric display} display placed outside the space displays this price of person count. This person count are going to be incremented if someone enters within the area and at that point lights area unit turned on. And during a reverse approach, person count are going to be decremented if someone leaves the space. once the amount of persons within the space is zero, lights within {the room/the space/the area unita} are turned off employing a relay interface. during this approach Relay will the operation of "Automatic light controller". Since this project uses two infrared sensors, it may be used as two-way person counter additionally.

I. INTRODUCTION

The objective of this project is to form a controller based model to count vary of persons visiting express house and consequently take away darkness from the house. Here we are going to use device and will perceive gift vary of persons. In today's world, there is a continuous would really like for automatic appliances. With the increase in customary of living, there is a means of urgency for developing circuits that will ease the standard of life. Also if in any respect one wishes to grasp the quantity of people gift in house soaps not to have congestion, this circuit proves to be helpful.

This project "automatic room light controller using bi-directional visitor counter" may well be a reliable circuit that takes over the task of persons/visitor among the house really accurately. once somebody enters into the room light will be switched ON, count will be incremented and and it displays the number of persons inside the room on LCD display. if somebody leaves the room the count will be decremented and light will be turned off in the room. the vary of person among the room collectively displayed on the seven section displays. The arduino and atmega328p controller can do the upper job. it receives the signals from the sensors, and this signal is operated beneath the management of computer code that's confine storage.

II. BLOCK DIAGRAM



A. Block Diagram Description

The basic diagram of the automatic room light controller using bi-directional visitor counter using microcontroller is shown within the on top of figure. principally this diagram consists of the subsequent essential blocks.

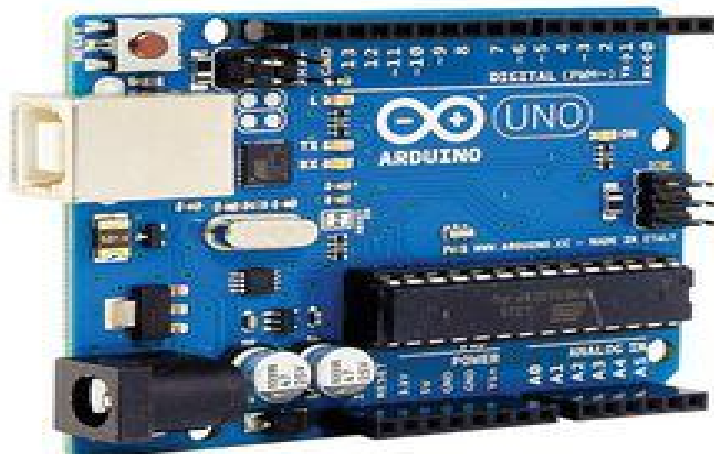
- 1) Power provide
- 2) Entry and Exit device circuit
- 3) Arduino UNO
- 4) Relay driver circuit
- 5) 16X2 LCD Display

Microcontroller ATmega328P micro controller endlessly monitor the infrared receivers, once any object expertise the IR rays falling on the receivers unit obstructed this obstruction is perceived by the microcontroller.

- a) *Power Supply:* Here we have a tendency to used +12V and +5V dc power provide. the most perform of this block is to produce the specified quantity of voltage to essential circuits. +12voltage is given. +12V is given to relay driver. to urge the +5V dc power provide we've got used here IC 7805, that provides the +5V dc regulated power provide
- b) *Enter and Exit Sensors:* This is one in all the most elements of our project. the most intention of this block is to sense the person. For sensing the person and light we tend to a mistreatment the light dependent register (LDR).its connected circuit diagram so device will count the persons.



- c) *Arduino Uno (ATMEGA328P):* The Arduino Uno board is a microcontroller supported the ATmega328. it's fourteen digital input/output pins within which vi are often used as PWM outputs, a 16 megahertz ceramic resonator, Associate in Nursing ICSP header, a USB affiliation, vi analog inputs, an influence jack and a push. This contains all the specified support required for microcontroller. An Arduino board traditionally consists of associate degree Atmel 8-16 with complementary elements that facilitate programming and incorporation into alternative circuits. a vital side of the Arduino is its normal connectors, that let users connect the card to a spread of interchangeable add-on modules termed shields. Some shields communicate with the Arduino board directly over varied pins, however several shields ar individually separately singly severally one by one on associate degree individual basis available via an I²C serial bus so several shields will be stacked and employed in parallel. It provides fourteen digital I/O pins, six of which may turn out pulse-width modulated signals, and 6 analog inputs, which may even be used as six digital I/O pins. This board contains a five V linear regulator and a sixteen Mc oscillator.



- d) *Relay Driver Circuit:* This block has the potential to drive the varied controlled devices. during this block primarily we have a tendency to an exploitation the semiconductor device and therefore the relays. One relay driver circuit we have a tendency to an exploitation to regulate the sunshine. output from ATmega328p is given to the bottom of the semiconductor device, that we have a tendency to a more energizing the actual relay. as a result of this applicable device is chosen and it do its assigned operate.

- e) *LCD Display*: LCD(liquid crystal display) is an electronic display module and finds wide range of applications.16X2 is a very basic module and commonly used in various devices and circuits.In this project LCD displays the number of persons inside the room.



III. EXPERIMENT EVALUATION

The IR transmitter can emit modulated 38 kilo cycle per second IR signal and at the receiver we tend to use TSOP1738 (Infrared Sensor). The output goes high once there's a pause and it come back to low once there's no obstacle to the ray. Input is given to the Port four of the Arduino microcontroller. Port eight to thirteen is employed for the 7-Segment show purpose. Port a pair of is employed for the Relay/LED activate and switch off Purpose. LTS 542 (Common Anode) is employed for 7-Segment show. which time Relay/LED can get Voltage and triggered therefore light-weight can get voltage and it'll activate. And once counter are going to be 00 that point Relay are going to be turned off. during this two-way circuit 2 infrared (IR) sensing element parts ar used for up and down enumeration, severally. Whenever a pause is determined by the IR sensing element then the IR sensing element increment the worth of counter and whenever the second sensing element detects any obstacle, the counter is decremented. the quantity of interruption count depend on the sensor's input Associate in Nursing d displayed on a collection of seven section displays by victimization the conception of multiplexing (for conception of multiplexing refer seven section multiplexing). The IR sensing element input is outlined as up and down selector mode for the counter within the code. whenever the primary sensing element is blocked, the primary sensing element provides a high voltage signals and also the count the worth gets incremented. the worth of second sensing element gets decremented once connected to second a sensing element, provides high input. At each setup, the worth of the counter is shipped and displayed it on the sensing element, provides high input. At each setup, the worth of the counter is shipped and displayed it on the seven segments.

IV. WORKING

The IR sensing element unceasingly senses the presence of any obstacles (a person in our case).If sensing element one senses an individual, it informs the controller that an individual has entered in order that controller will increment the count.At constant time it offers a delay of one sec in order that the person will cross the sensing element two and therefore the count is maintained properly.When an individual exits, the sensing element two informs the controller to decreement the count. equally it additionally provides a delay of one sec to keep up count properly.The count is displayed on digital display by the controller.If there's a minimum of one person is within the hall, associate degree semiconductor diode can glow otherwise it's off.

V. APPLICATIONS

- A. For counting purposes.
- B. For automatic room light control.
- C. It can be used at homes and other places to keep a check on the number of persons entering a secured place.
- D. It can also be used as home automation system to ensure energy saving.

VI. ADVANTAGES

- A. Low cost.
- B. Easy to use.
- C. Can be implemented in single door.
- D. Can be used for counting purposes.
- E. Can be used for automatic room light control.

VII. DISADVANTAGES

- A. It is used only when one person cuts the rays of the sensor hence cannot be used when two or more persons cross the door simultaneously.



VIII. CONCLUSION

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 be 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.

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