

Light Automation Using Bidirectional Visitor Counter

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Aim Of The Project



Electricity is one of the most important resources in this country so we have to conserve the electricity .



But many times people come outside the room/hall forgetting to turn off the lights/fan thus the electricity is wasted



The concept behind this project is to cut power supply when there is no one in the room, thus reducing energy consumption



Project overview

- when somebody enters into the room then the counter is incremented by one and the light in the room will be switched ON in a sequence.
- And when any one leaves the room then the counter is decremented by one the lights will be switched OFF in a sequence when the persons in the room go out
- The total number of persons inside the room is also displayed on the Lcd display



**PROJECT
OVERVIEW**



List of components:



Arduino board

Arduino board acts as a micro controller it interacts with sensors ,processes their input .

Arduino Uno is used for controlling whole the process of this visitor counter project. the outputs comparators are connected to digital pins of arduino



IR sensor

- infrared sensor
- In this project we have used two IR sensor modules. Here in this circuit we have used two companions for two sensors.
- It will detect the persons who comes into the room and leaves the room

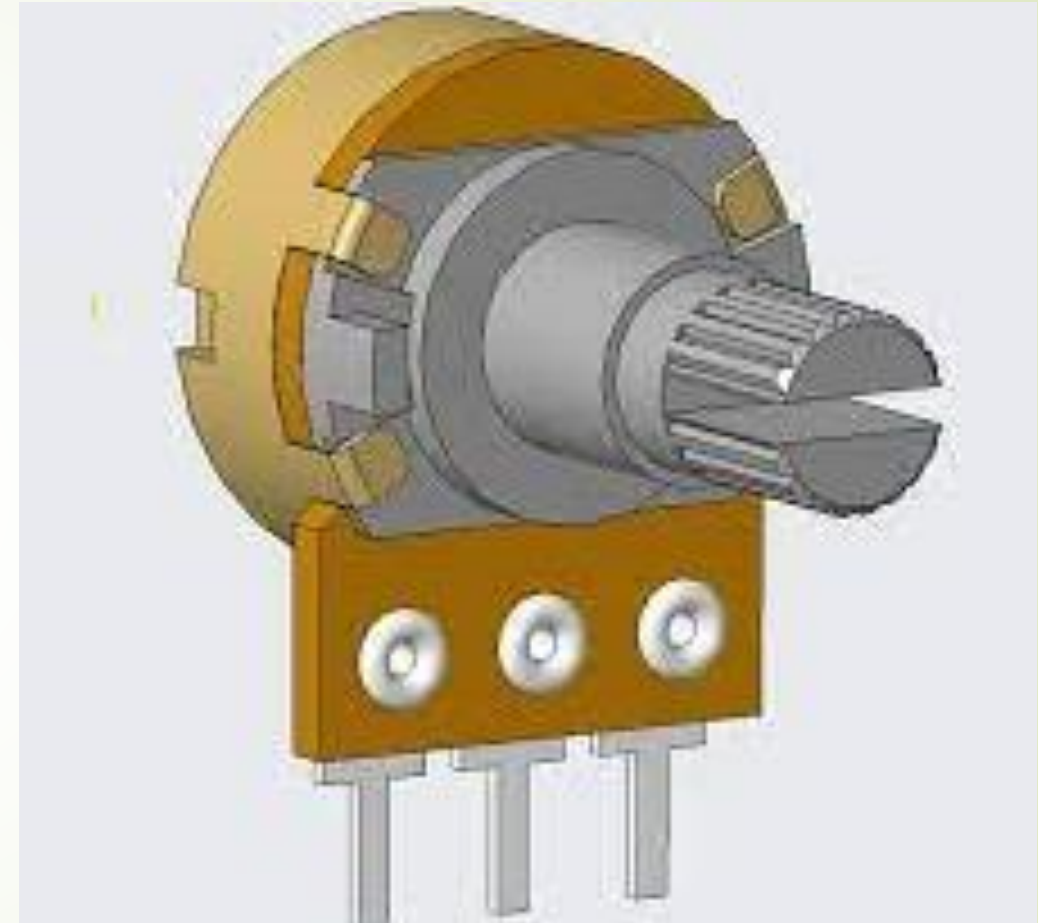
LCD Display Output of sensor

- It is lighter, thinner and flexible. LCD provides excellent resolution, brightness, and contrast so the picture quality is crystal clear.
- In this project we use lcd for display the Visitor count & light status



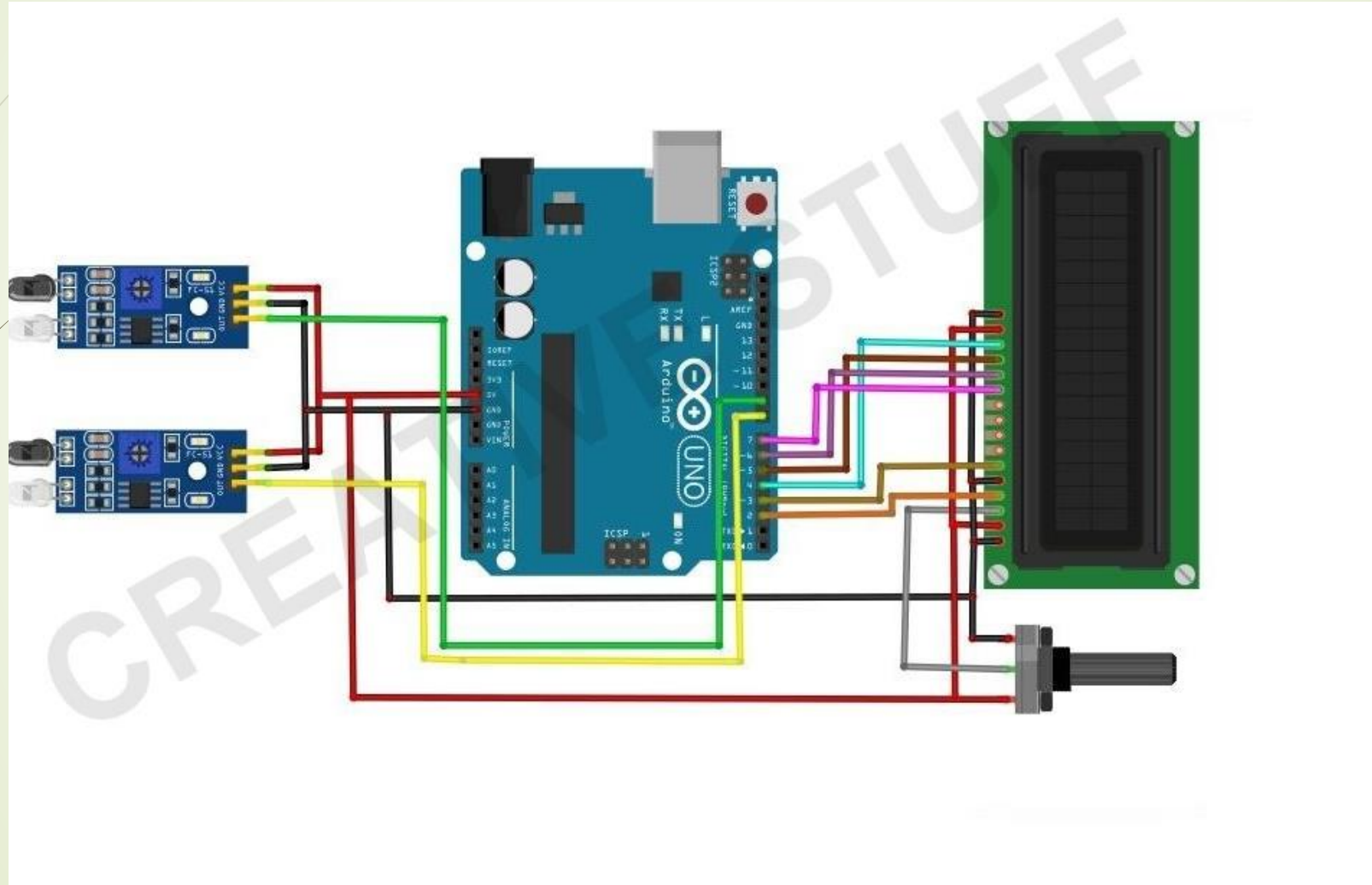
Potentiometer

- A potentiometer works by adjusting the position of a wiper along a resistive element changing the resistance and consequently the output voltage
- This variable voltage can be used for the range of control applications in electronic circuits






CIRCUIT DIAGARM



ARDUINO CODE:




```
#include<LiquidCrystal.h>
LiquidCrystal lcd(2,3,7,6,5,4);
```

```
#define in 8
#define out 9
#define led 10
```

```
int count=0;
```


```
void setup()
{
  lcd.begin(16,2);
  lcd.print("Visitor Counter");
  delay(2000);
  pinMode(in, INPUT);
  pinMode(out, INPUT);
  pinMode(led, OUTPUT);
  lcd.clear();
}
```



```
lcd.print("Person In Room:");  
lcd.setCursor(0,1);  
lcd.print(count);  
}
```

```
void loop()  
{  
  int in_value = digitalRead(in);  
  int out_value = digitalRead(out);  
  if(in_value == LOW)  
  {  
    count++;  
    lcd.clear();  
    lcd.print("Person In Room:");  
    lcd.setCursor(0,1);  
    lcd.print(count);  
    delay(1000);  
  }
```

```
  if(out_value == LOW)  
  {  
    count--;  
    lcd.clear();
```

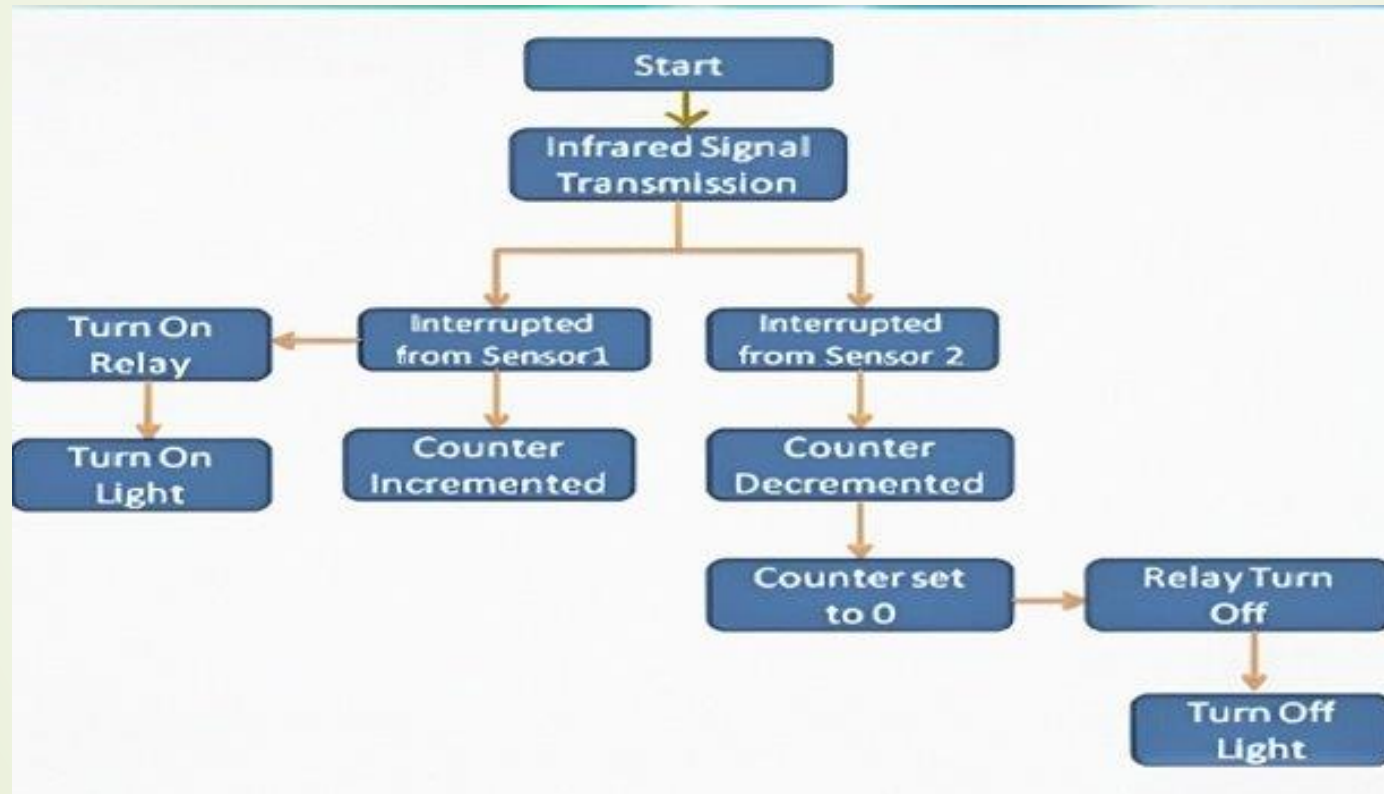


```
lcd.print("Person In Room:");  
  lcd.setCursor(0,1);  
  lcd.print(count);  
  delay(1000);  
}
```

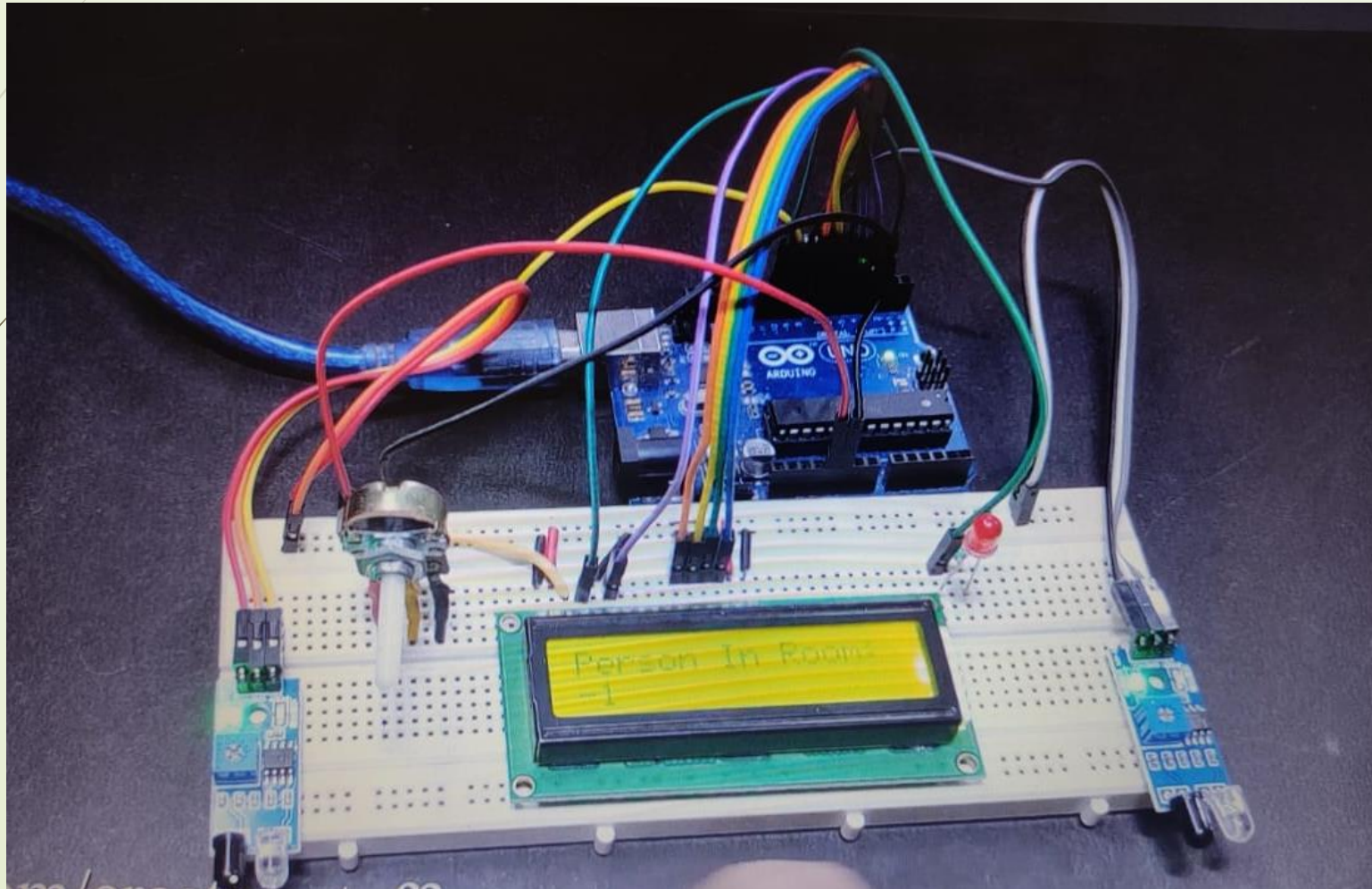
```
if(count==0)  
{  
  lcd.clear();  
  digitalWrite(led, LOW);  
  lcd.clear();  
  lcd.print("Nobody In Room");  
  lcd.setCursor(0,1);  
  lcd.print("Light is Off");  
  delay(200);  
}
```

```
else  
{  
  digitalWrite(led, HIGH);  
}  
}
```


Working principle:



hardware implementation:





Advantages:

- **Energy efficiency:-** It helps to optimise the energy usage in turning lights on only when needed.
- **Automation:-** The system provides the automated control, eliminating the need of human intervention.
- **Customization:-** User can set the parameters.
- **Adaptability:-** The system can adapt changing environmental conditions and user behaviour, providing a dynamic and responsive lighting solution.
- **Cost & power saving**



DISADVANTAGES:

- **Sensitivity to false triggering:**-IR sensors can be sensitive and might trigger false positive due to factors like changes in temperature ,non -human movements.
- Limited range
- Response time
- **Limited field view:**-IR sensor have a specific field of view, and if an animal ,or object enters at an angle not covered by the sensor, it may not be detected.
- Dependency on light conditions
- Power consumptions



APPLICATIONS:

- **Healthcare Facilities:** Automatic lighting control in healthcare settings, including patient rooms and common areas, contributes to energy savings and patient well-being.
- **Educational Institutions:** Classrooms, libraries, and other spaces in schools and universities can benefit from bidirectional counters for efficient lighting management, adapting to occupancy patterns.
- **Industrial Settings:** In warehouses, factories, and manufacturing facilities, bidirectional counters can optimize lighting based on the presence of workers, contributing to energy efficiency and safety.

- 
- 
- **Parking Lots:** Implementing bidirectional counters in parking lots allows for dynamic control of lighting, saving energy when areas are unoccupied and enhancing safety for pedestrians and drivers.
 - **Transportation Hubs:** Bus stations, train platforms, and airports can use bidirectional counters for efficient lighting in waiting areas, ensuring a balance between energy savings and passenger safety.



- In bidirectional visitor counter the voice alarm may be added to indicate room is full and person can't enter in the room.
- It can be used at homes and other places to keep a check on the number of persons entering a secured place.
 -
 - ❖ Today's ignorance will bring a dark tomorrow.
 - ❖ Your one save will make a big move



REFERENCES:

- Smith, J. (2018). Intelligent Lighting Control Systems: A Review of Occupancy Sensing and Automated Lighting Control. *Journal of Lighting Research and Technology*, 50(5), 752-764.
- National Renewable Energy Laboratory. (2016). Best Practices for Controlling Plug Loads Using Automatic Switches. Retrieved from
- <https://www.nrel.gov/docs/fy16osti/65207.pdf>
- Pereira, L., & Alves, M. (2017). Automatic Lighting Control Based on Occupancy Detection for Energy Saving. *International Journal of Engineering and Technology*, 9(3), 204-212.

The background features a faint, stylized illustration of a lightbulb with several lines radiating from it, suggesting light or ideas. There are also thin, wavy lines in the bottom left corner.

Conclusion

- Light automation utilizing bidirectional counters offers a versatile and efficient solution for various applications. The potential for integration with advanced sensor technologies and IOT opens the door to even more intelligent and adaptive lighting systems in the future





Thank you



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