Intelligent Room Illuminator

Project Report Submitted

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Introduction

Visitor counters have evolved significantly in their role of monitoring crowd behavior at various locations. The initial replacement of the tally stick with a mechanical tally counter marked the early stages of this evolution. This transition allowed for more efficient and accurate tracking of visitors. As technology continued to advance, electronic tally counters emerged as the next phase in this evolution. These electronic counters revolutionized the process by incorporating an LCD screen for displaying the count, providing a clearer and more readable output. Moreover, the introduction of a push-button mechanism for tally advancement simplified the operation and enhanced user convenience. This progression showcases a shift from manual to electronic methods, emphasizing increased accuracy, readability, and ease of use in monitoring and managing crowd movements. The evolution of visitor counters reflects the continuous innovation in technology to meet the demands of efficiently tracking and analyzing crowd behavior in various settings.

Description

Counting humans manually has proven to be both unreliable and costly, as it can be tasking for an individual to manually count the number of people entering and leaving[1]. However, an automated crowd limiting system can be helpful to reduce costs and improve reliability, such as a contactless bi-directional visitor counting system[2]. Visitor counting involves tracking the flow of individuals entering and exiting various spaces such as conference rooms, shopping malls, and sports venues. This measurement serves as a vital metric for assessing the foot traffic in these locations. ‘With the increase in standard of living, there is a sense of urgency for developing circuits that would ease the complexity of life’[3].

The urgency to develop such circuits stems from the desire to enhance efficiency and convenience in managing spaces where people gather. These circuits are anticipated to play a crucial role in optimizing the operation of facilities by providing real-time data on visitor movement. This multifaceted project seeks to provide an innovative and energy-efficient solution by utilizing the computational capabilities of the LPC1768 ARM Microcontroller. It aims to minimize energy consumption while ensuring user convenience and comfort. The system's versatility allows it to be seamlessly integrated into various environments, enhancing user experiences and promoting energy conservation. This project serves as a testament to the capabilities of advanced microcontroller technology and aims to educate users about the benefits of energy-efficient lighting and environmentally conscious habits. It combines technological advancement, user-centric design, and environmental responsibility to provide a holistic solution for intelligent room illumination.

Hardware Used

- The LPC1768, an ARM Cortex-M3 based 32-bit microcontroller by NXP

- Infrared (IR) sensors are devices that detect and measure infrared radiation in their surroundings. They operate within the infrared range of the electromagnetic spectrum, typically between 700 nanometers to 1 millimeter. These sensors are widely used in various applications, including proximity and motion detection, temperature measurement, and remote-control systems.
  IR sensors function by detecting the IR radiation emitted or reflected by objects in their vicinity. They consist of an emitter that emits infrared light and a receiver that detects this emitted or reflected light. The receiver then translates the received signal into an electrical signal, which is processed to determine the presence, distance, or characteristics of the object.

Software Used

- Keil Vision4
- Flash Magic 7.20

Figures:

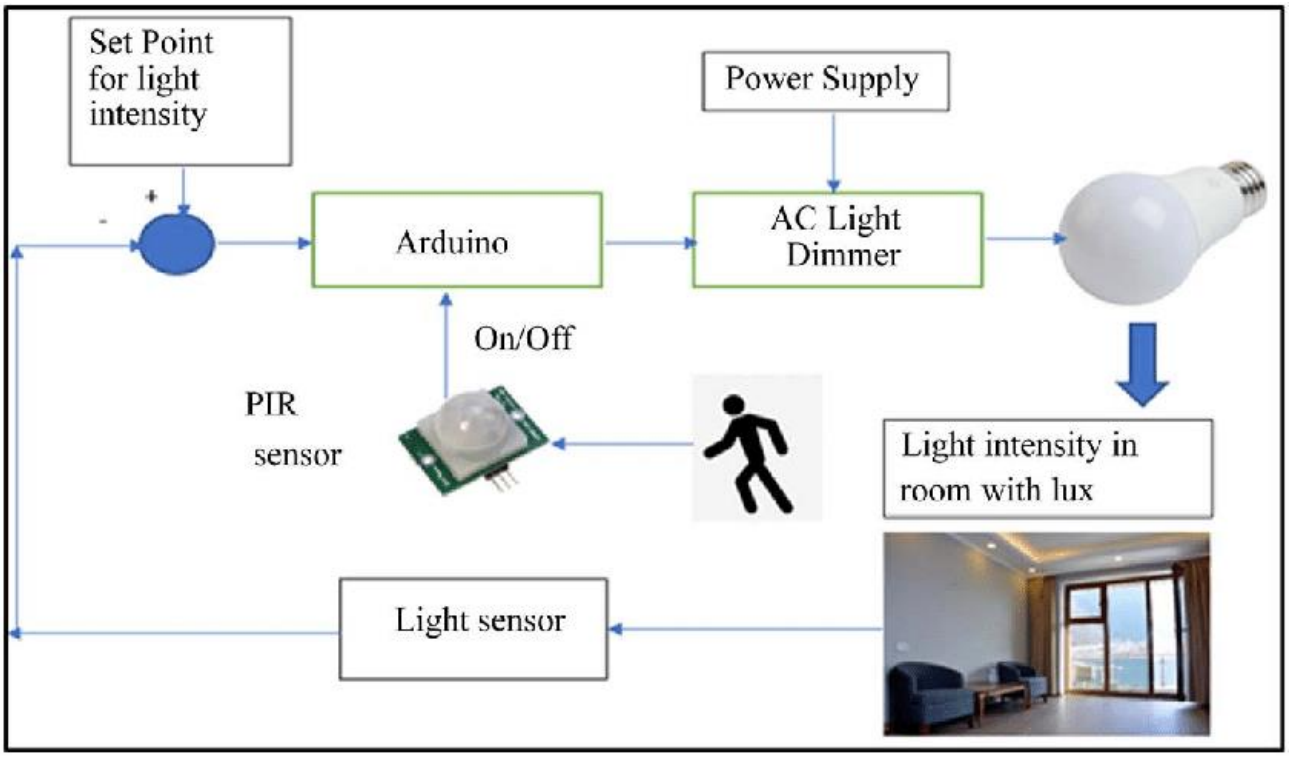

Fig 1.2: Flow Diagram

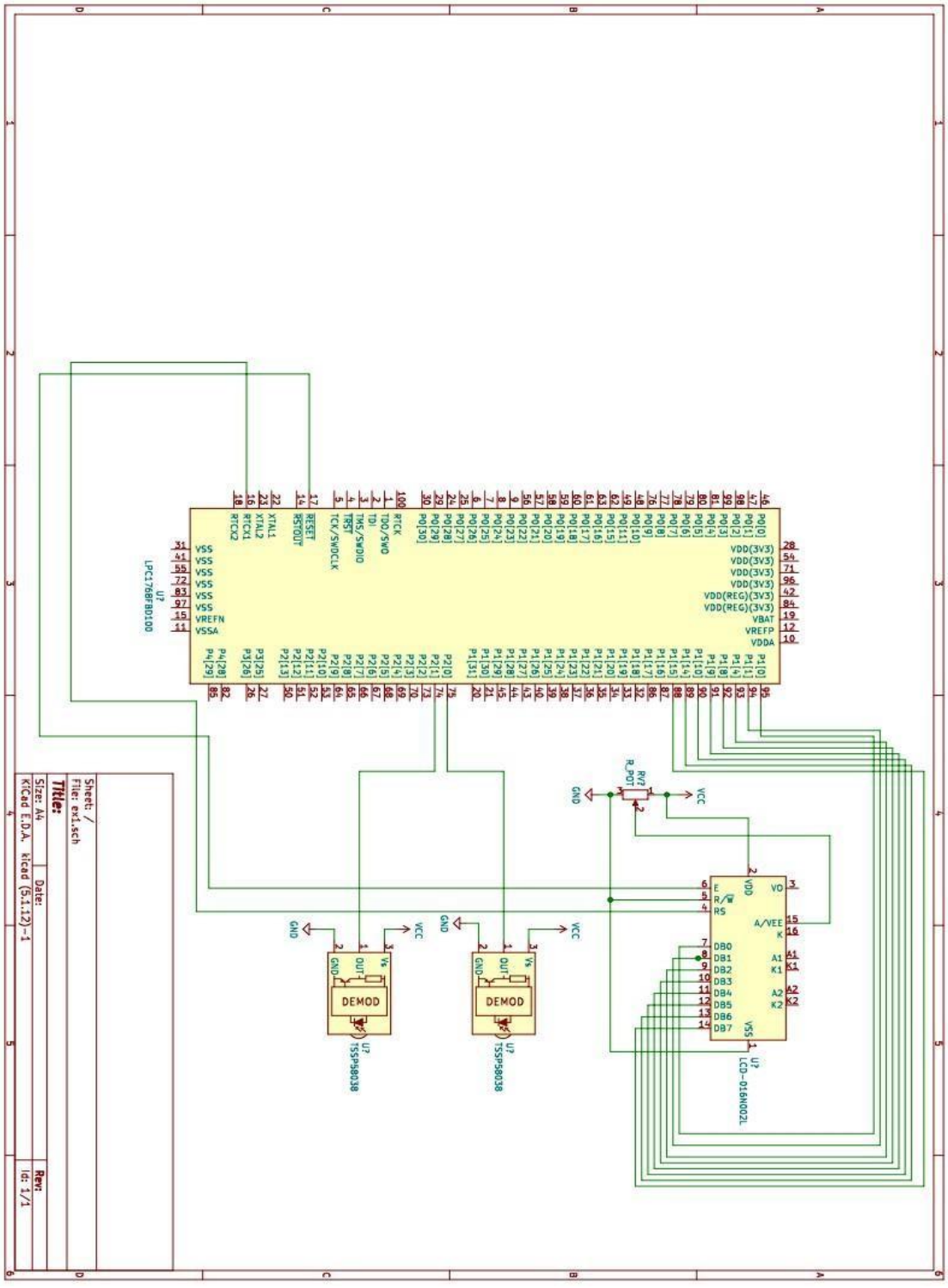

Fig 1.1: Circuit Diagram

Conclusion

This system can be used to automate a room. The Entry and exit Visitor Counter with Automatic Room Light Controller is a model that accurately counts the number of visitors in a room and controls the room lights accordingly. When someone enters the room, the counter is incremented by one and the room lights are switched on automatically. When someone leaves, the counter is decremented by one and the lights are switched off only when all people leave the room [4]. People counting is also useful for event management, security, and smart cities applications and many more real-life applications. The LPC1768 Training Kit project was created as a part of our ES LAB PROJECT Vth sem. The objective of building this project was to check the connectivity and effectiveness of the IR sensor with the LPC1768 Training Kit and its connection with the Liquid Crystal Display (LCD) to display the count accurately. In this project we learnt to write an effective code for the LCD configuration of LPC 1768 and understood the functioning and working of both the LCD and the sensor. We got an opportunity to learn the basic concepts of Embedded C programming and voltage manipulating. Developing a working code for the LPC1768 kit made me understand the functioning of the components more effectively.

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