CSE-321L Electronics I

Automated Visitor Counter With 7 Segment Display

Submitted to

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1. Introduction

The system is meant to save energy and is particularly useful if we want to count the number of people who are going to attend a specific event or function. It also helps in data collection by counting the number of attendees. The counter is simply incremented to do this.
In order to accomplish this, the system employs Infrared Sensor pairs, which saves a significant amount of energy. Each pair consists of two sensor pairs set in opposing directions at a fixed distance from one another. The IR transmitter sends infrared rays directly to the receiver, which receives the signal and passes it to an 8051 microcontroller.
The IR sensor module detects when a human enters the area where the device is installed, and this information is relayed to the microcontroller. This input is processed by the microcontroller. The system also counts the number of persons present at this time and increases a counter with each arrival; this count is shown on a 7-segment display.

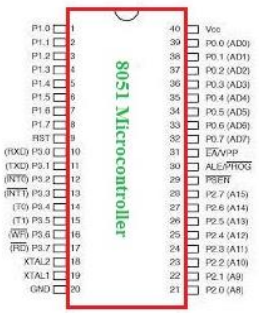
2. Electronic Components

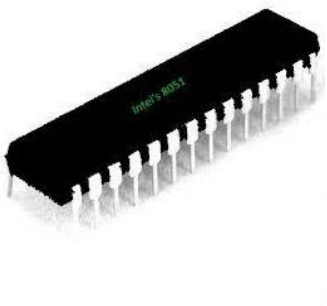
The following components were used in making the Automated Visitor Counter with 7 Segment Display:

- 8051 series Microcontroller
- Transistor
- Push Button
- Diodes
- Voltage Regulator
- IR Receivers
- LED
- IR LED's
- 7- Segment Displays
- 555 Timers

8051 series Microcontroller

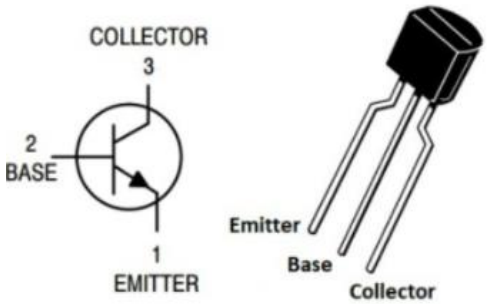
The Intel 8051 Microcontroller is a simple form of microcontroller that was invented in the 1980s. This microcontroller was created primarily for use in embedded systems technology and was based on Harvard Architecture.





Transistor

A transistor is an electronic component that may be used to amplify or switch electrical signals or power in circuits, allowing it to be employed in a variety of electronic devices. A transistor is made up of two PN diodes linked in series. Emitter, base, and collector are the three terminals.

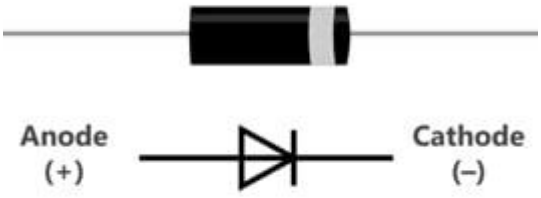


Push Button

A push-button, also known as a basic button, is a simple switch mechanism used to operate a machine or a process. Buttons are commonly made of hard materials such as plastic or metal.

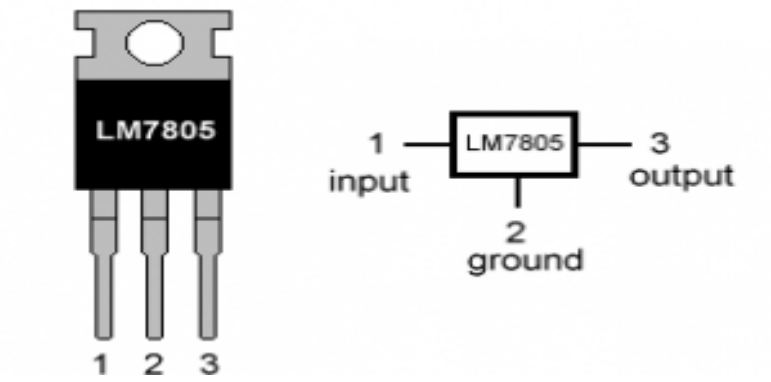
DIODES

Diode is an electrical component that allows the flow of current in only one direction. In circuit diagrams, a diode is represented by a triangle with a line across one vertex. The most common type of diode uses a p-n junction. When this junction is forward biased (that is, a positive voltage is applied to the p-side), electrons can easily move across the junction to fill the holes, and a current flows through the diode. And in reverse biased condition, no current flows through the diode.



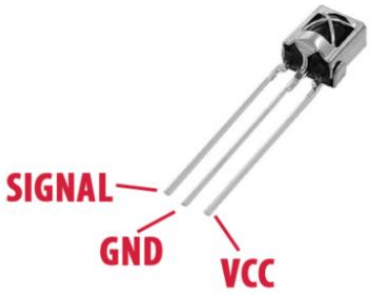
Voltage Regulators

A voltage regulator produces a fixed output voltage of a predetermined magnitude that stays constant independent of changes in the input voltage or load circumstances. It compares the output voltage to a precise reference value and makes adjustments to the pass device to keep the output voltage constant.



IR Receivers

In an IR system, an infrared receiver sends signals to control and operate equipment. These gadgets, like a TV or a cable box, take up infrared signals from your remote control. They encode and amplify an IR signal to make it acceptable for transmission over low-voltage cable after receiving it.



LED

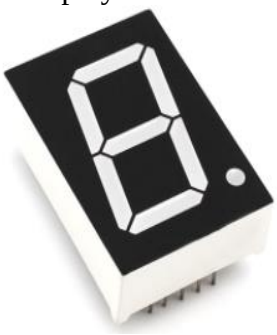
When current runs through a light-emitting diode, it produces light. Electrons recombine with electron holes in the semiconductor, producing energy in the form of photons.

IR LED's

A solid-state light-emitting diode (SSL) that generates light in the infrared band or region of the electromagnetic radiation spectrum is known as an infrared light-emitting diode (IR LED). IR LEDs are also helpful in a variety of electrical devices, such as television remote controls and a variety of other devices.

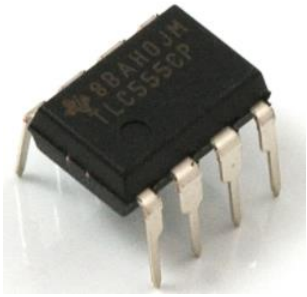
7-Segment Display

A seven-segment display is a type of electronic display device for displaying decimal numbers that is less complicated than dot matrix displays. Digital clocks, electronic meters, rudimentary calculators, and other electronic devices that show numerical data commonly employ seven-segment displays.



555 Timers

The 555 timer IC is an integrated circuit that may be used to create timers, delays, pulse generators, and oscillators. Two or four timing circuits are combined in a derivative.



3. Block Diagram: