

ARDUINO BASED 3D LED CUBE

T.Udhayarani,

Department of E.C.E,

P.T.Lee. Chengalvaraya Naicker Polytechnic, Vepery, Chennai.

ABSTRACT

Here we structured a 4x4x4 drove 3D shape to extend an image or picture and we connected changes to show distinctive image and picture. At the point when a switch is squeezed and it utilized for anticipating a picture yet now it won't show picture yet we expands the 3D square goal picture will be anticipated in 3 measurement subsequently we can undoubtedly observe picture in all the bearing with no negative picture or polarizing impact.

INTRODUCTION

64 LEDs combine to form 4 by 4 by 4 3D shape, constrained by an Atmel Atmega16 microcontroller. Each LED can be tended to exclusively in programming, empowering it to show stunning 3D movements. Here we utilizing Atmega 2560p to make the 4x4x4 block with button control for speaking to various sort of portrayal in 3D model. In this venture ARDUINO MEGA is utilized for controlling the entire procedure of tuning ON and OFF the LED in required example. To make a 3D LED CUBE equipped for demonstrating pre-characterized activity we have utilized ARDUINO MEGA with related parts. A 4x4x4 LED CUBE is utilized to extend a picture or an image. This technique for projection builds the picture goal. Any 3D picture might be made utilizing the program. Any picture can be made without negative polarization.

METHODOLOGY

In this circuit diagram we have attached led and switches as input and output. In the input when we press a button it will project different kind of symbols and design and all the program will done through the Arduino mega and here we are using BC547 for increasing the voltage as well as current for glowing 64 LED at a time. The block diagram of led 3D cube is shown in figure 1.

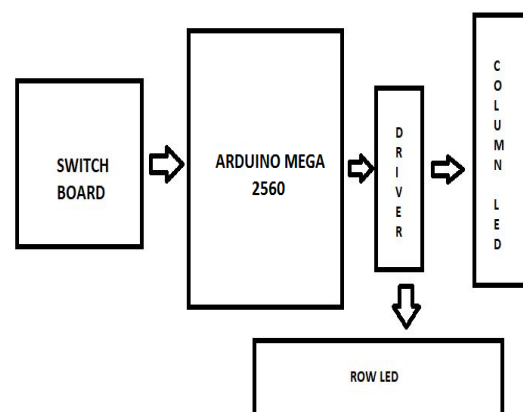


Figure 1: Block diagram of proposed 3D cube.

The circuits controlling the drive block is depicted in the joined schematic picture. The RS-232 interface is discretionary or can be discarded. Future firmware's will empower PC correspondence is shown in figure 2.

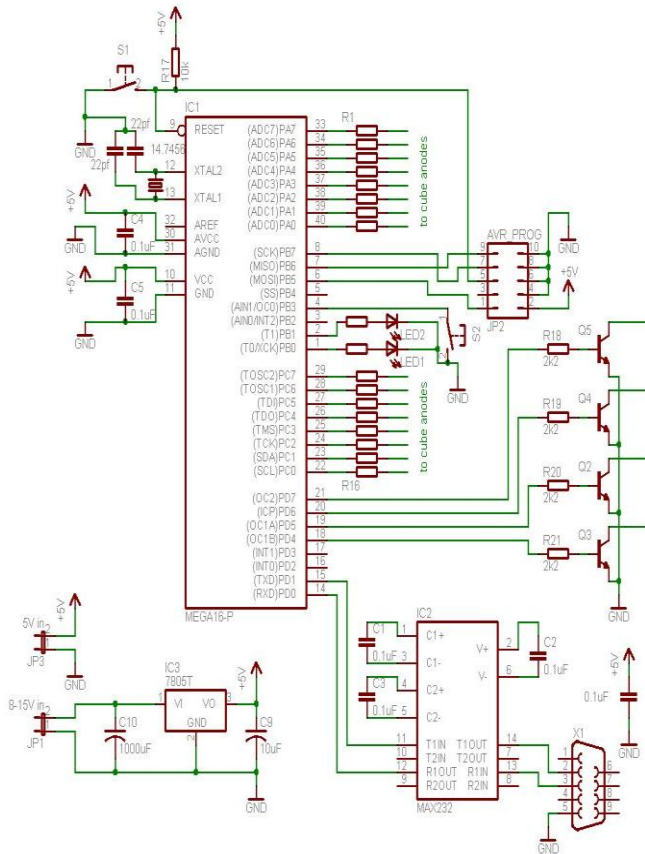


Figure 2: Circuit diagram of Arduino with LED cube.

HARDWARE DETAILS

The Arduino Mega, microcontroller board based works with ATmega2560. The arduino mega comprises of 54 digital I/O pins. The arduino mega comprises of 16 analog input pins, 4 UARTs, a 16 MHz crystal oscillator, a USB connection for power and serial communication, a voltage power jack, an ICSP header, reset button.

The arduino board can be powered by connecting it to a computer with a USB cable. For standalone applications it can be connected to a AC-to-DC adapter or battery.

POWER

The Arduino Mega2560 can be controlled by means of the USB association or with an outer force gracefully. The force source is chosen consequently. Outside force can come either from an AC-to-DC connector or battery. The connector can be easily connect by stopping a 2.1mm focus positive fitting into the board's capacity jack. Leads from a battery connect with Gnd and Vin pin headers of the POWER connector.

The board can work on an outer flexibly of 6 to 20 volts. Whenever provided with under 7V, nonetheless, the 5V pin may gracefully under five volts and the board might be insecure. On the off chance of greater than 12V, the voltage controller heats up and affects the board.

The prescribed range is 7 to 12 volts. The Mega2560 contrasts from every single going before board in that it doesn't utilize the FTDI USB-to-sequential driver chip. Rather, it includes the Atmega8U2 customized as a USB-to-sequential converter.

THE POWER PINS ARE AS FOLLOWS:

VIN:

The input voltage to Arduino board when it's connected using an external power source

5V:

The regulated supply powers the microcontroller or it can be powered by a VIN via an on-board regulator

3V:

A 3.3 volt supply generated by the on-board regulator. Maximum current draw is 50 mA.

GND:

Ground pins.

The part description of LED is shown in figure 3.

Light-Emitting Diode

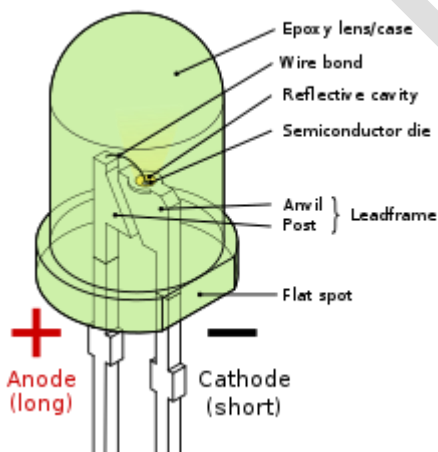


Figure 3: Image of Surface Mount LED

A bulb-formed present day retrofit LED light with aluminium heat sink, a light diffusing arch and E27 screw base, utilizing an

inherent force flexibly taking a shot at mains voltage

A light-radiating diode (LED) is a semiconductor light source that discharges light when current moves through it. Electrons in the semiconductor recombine with electron openings, delivering vitality as photons. The shade of the light (relating to the vitality of the photons) is dictated by the vitality required for electrons to cross the band hole of the semiconductor. White light is gotten by utilizing numerous semiconductors or a layer of light-radiating phosphor on the semiconductor device.

Showing up as viable electronic segments in 1962, the most punctual LEDs transmitted low-power infrared light. Infrared LEDs are utilized in controller circuits, for example, those utilized with a wide assortment of buyer hardware. The main noticeable light LEDs were of low force and restricted to red. Present day LEDs are accessible over the noticeable, bright, and infrared frequencies, with high light yield.

Early LEDs were frequently utilized as pointer lights, supplanting little radiant bulbs, and in seven-section shows. Late advancements have delivered high-yield white light LEDs reasonable for room and open air territory lighting. LEDs have prompted new shows and sensors, while their high

exchanging rates are valuable in cutting edge correspondences innovation.

LEDs have numerous points of interest over brilliant light sources, including lower vitality utilization, longer lifetime, improved physical power, littler size, and quicker exchanging. LEDs are utilized in applications as assorted as flight lighting, car headlamps, promoting, general lighting, traffic lights, camera streaks, lit backdrop, plant developing light, and clinical devices.

In contrast to a laser, the light discharged from a LED is neither frightfully intelligible nor even exceptionally monochromatic. Be that as it may, its range is adequately limited that it appears to the natural eye as an unadulterated (immersed) color. [9][10] Nor, in contrast to most lasers, is its radiation spatially cognizant, with the goal that it can't move toward the high brightness normal for lasers.

Conclusion

Driven 4x4x4 isn't indicating an article in high goal however it can grew effectively to speak to a 4k picture. By utilizing this innovation we can likewise extend an article in 3 measurements accordingly we can undoubtedly see the item obviously with no shadow impact.

Author Bibliography



T.Udhayarani received her B.E(ECE) degree from P.S.N.A Engineering college & M.E (Applied Electronics) degree from College of Engineering, Anna University, Chennai. She is currently working as Head of Department (E.C.E), P.T.Lee. Chengalvaraya Naicker Polytechnic, Vepery, Chennai.