CSE316 Microcontroller Project
4x4x4 LED CUBE

By
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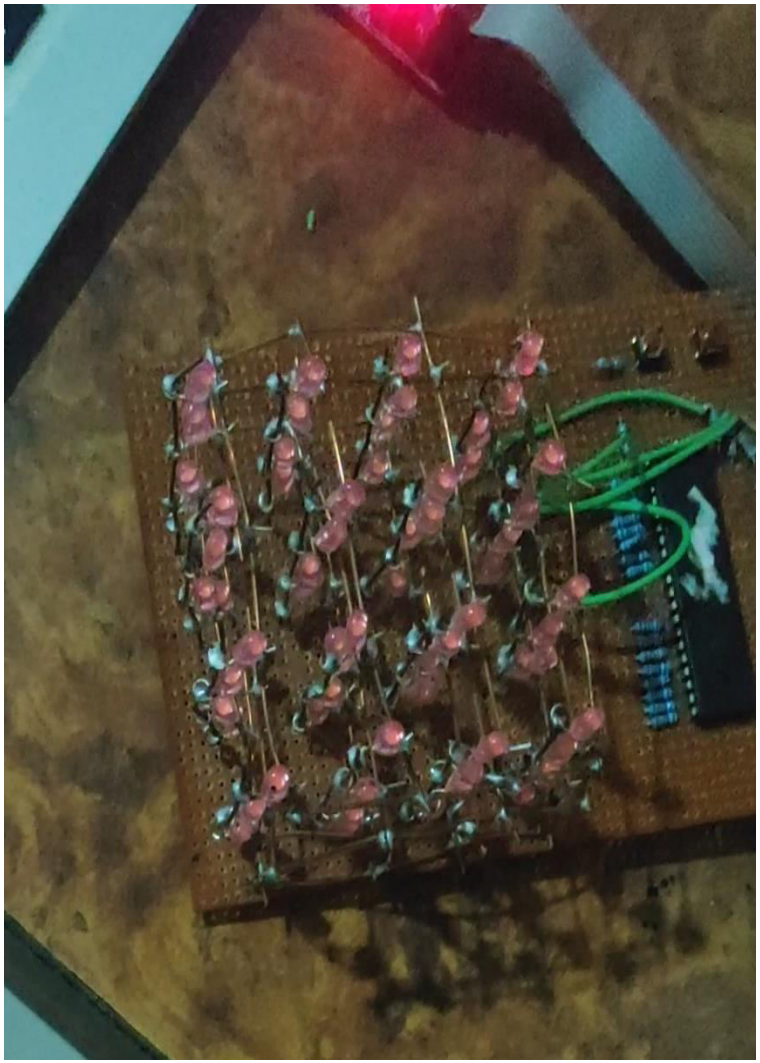

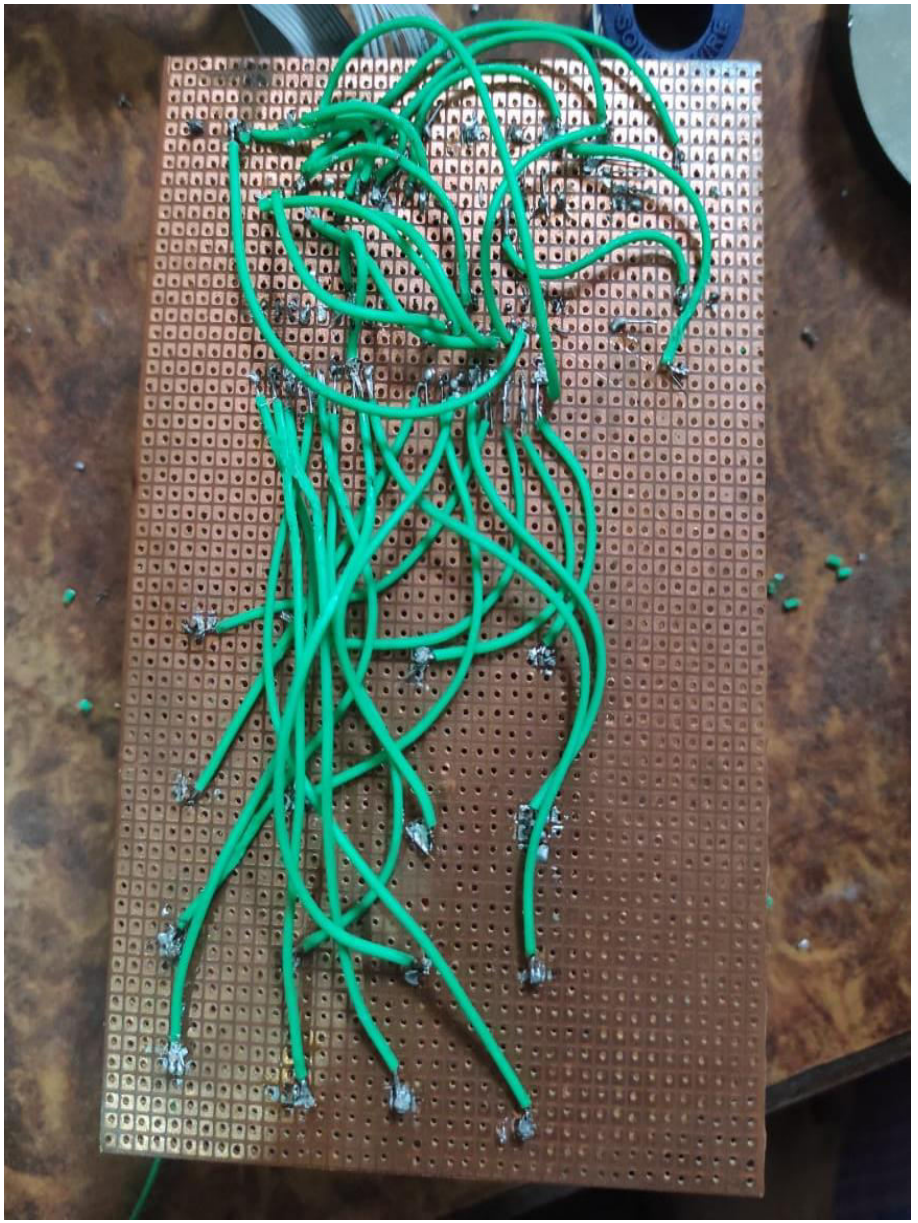

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- Introduction

  Our project consists of building a 3 dimensional LED array that will be able to display various graphics through the concept of persistence of vision. The LED cube will be able to change designs. We have used a total of 4x4x4 = 64 cubes for this project that outputs different designs.As we run code the total 8 design starts to appear in LED cube

Hardware : List of hardwares Equipments

Atmega32 microcontroller

64 Blue LEDs

Protoboard. The type with copper circles.

Thick wires

Resistors

Cupper wires

Male-Male, Male-Female Wires

USB ISP 2.0 AVR Programmer

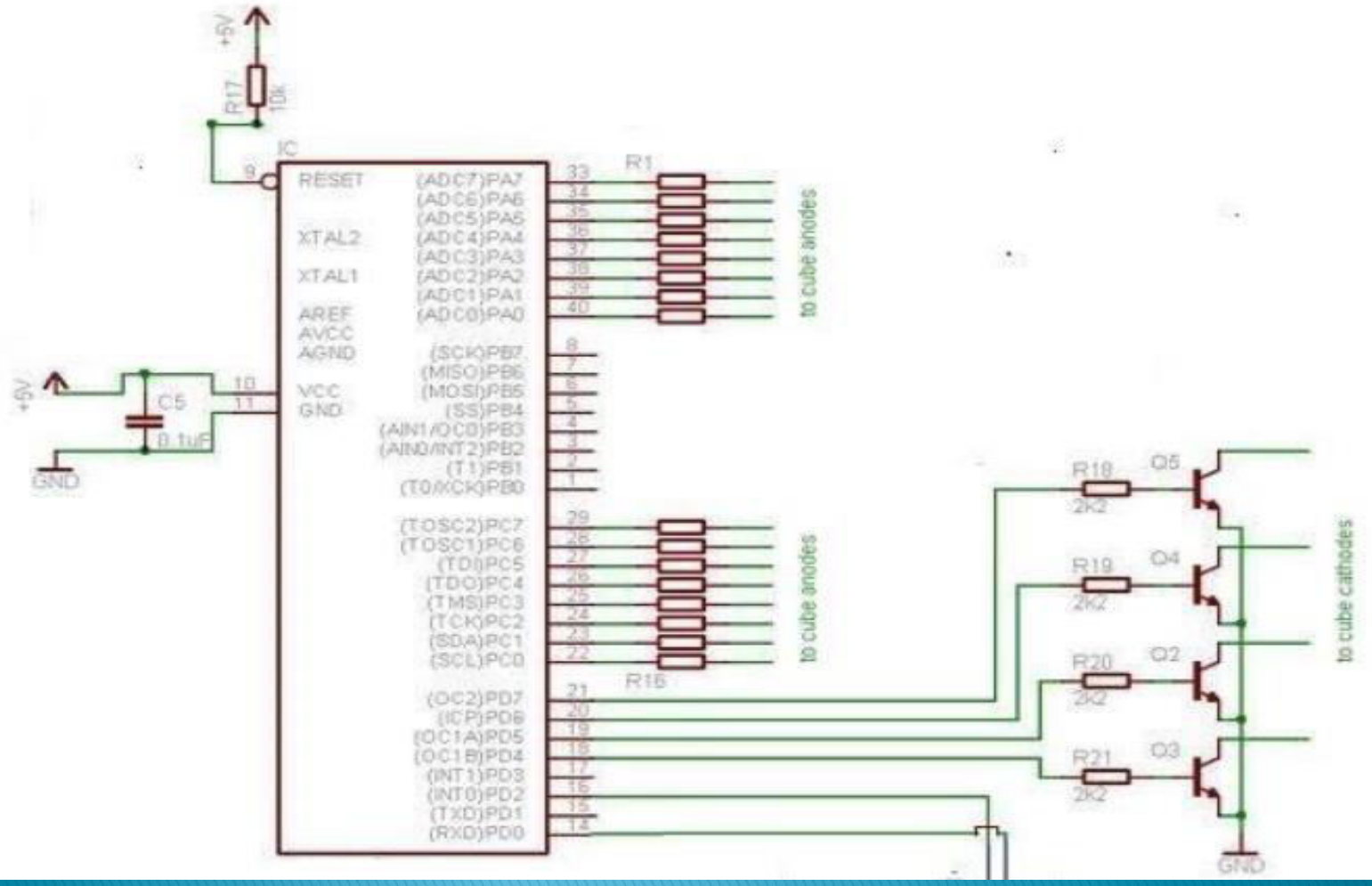
Software Requirements:

List of **Softwares used**

- ATmel Studio 6.2 (to compile .c code and build .hex file)
- eXtreme Burner - AVR (to load .hex file onto ATmega32)
- Proteus 8 Professional (for circuit design)
- Zadig (for driver installation needed)

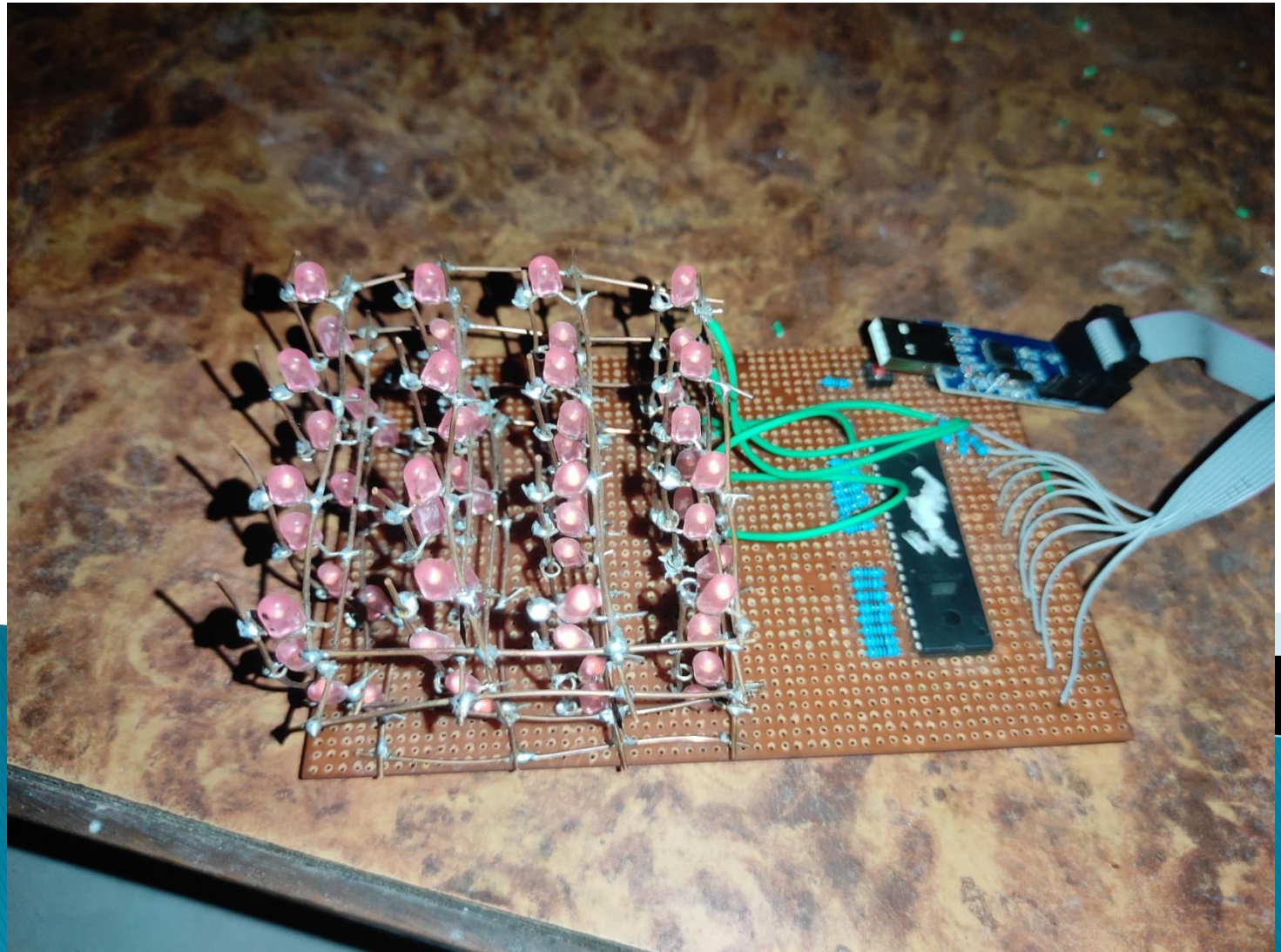
Circuit Diagram

showing **Complete Connection**



Actual Circuit

Snapshot of the working circuit.



used

Atmega32:

ATMEGA32 is easy to **program AVR controller**. With appreciable program memory it can satisfy most EMBEDDED SYSTEMS. With various sleep modes it can work on MOBILE EMBEDDED SYSTEMS. Along with 32 programmable Input/Output pins, it can interface many peripherals easily.

USB ISP Programmer

This was used to burn the .hex and .eep file into the Atmega32 flash memory and EEPROM. It is powered off of 5V USB bus. Our whole project is powered using its USB port power supply.

Problems Faced

Describing **the practical issues and observations made while putting the project together.**

- First of all, to make the 4x4x4 LED Cube was more difficult than we had expected.

Soldering took a lot of time and required a lot of patience.

- To make the circuit more cleaner, we first preferred to use beardboard, but it didn't

work out well. So we shifted to using Protoboard. The type with copper circles.

- ATmega 32 that we had bought had some internal problems, it took quite a time to understand this while we were thinking there is error in our code.later I get to know there is problem in ports.
- Overall, both the hardware implementation and software implementation was quite difficult than expected.