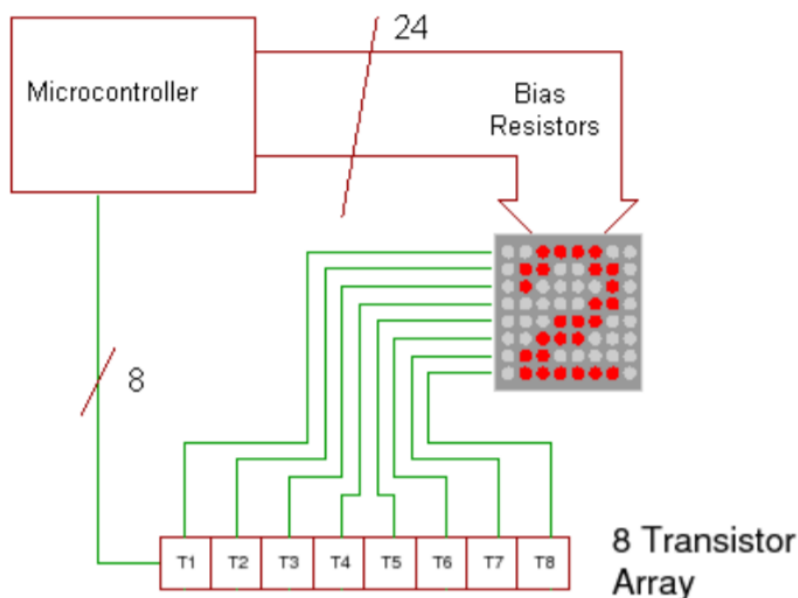# LED Matrix

Abstract:

The project LED Matrix Display is concerned with the construction of a two dimensional arrangement of LEDs in a rectangular arrangement for the purpose of displaying English Alphabets (Upper Case) and decimal numerals. The characters to be displayed are enter a computer. Therefore, in this project the computer functions as an input device and LED Matrix Display functions as an Output device. A computer program shall also be included in the project to create a user-interface environment to enter the characters and numbers to be displayed.

Introduction:

This project will provide a comprehensive tutorial on how to drive and control a dot matrix Light-Emitting Diode (LED) display with a microcontroller. The display used is a commercially available PCB mount 8 x 8 dot matrix RGB LED display, with a total of 192 individual LEDs that are controlled by 32 control signals. The microcontroller used is an Atmel ATMega128; however, the control and programming will be explained in general terms as well to allow for adaptation to any comparable microcontroller or LED matrix. Figure 1: 8x8 Dot Matrix LED Display The Dot Matrix LED Display An LED Matrix consists of an array of LED' s which are interconnected such that the positive terminal (anode) of each LED in the same column are

connected together and the negative terminal (cathode) of each LED in the same row are connected together. Note that this could be the other way around as well, with the positive terminals connected to the rows and the negative terminals connected to the columns.

Block Diagram:

Conclusion:

As is apparent, there are many different options when it comes to choosing a microcontroller and LED matrix to work with. It is easiest to choose an LED matrix first and then to select a microcontroller that meets the demands of the LEDs to be controlled. Once the basic setup is complete, the real challenge lies in programming the LED matrix to display interesting patterns. A good expansion is to capture an input signal using an ADC and then modify the display based on the input signal information.