TENET TECHNETRONICS

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Application Note on Interfacing Arduino with 4x4 LED matrix

Author: vivek.g.s
Reviewer:
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Interfacing Arduino UNO with 4x4 LED matrix

Introduction

In this application note we will be discussing on interfacing MCP3008 with Arduino UNO to drive the motor. Here we will be connecting the L298D output to drive inductive loads such as relay, solenoids, DC and stepper motors.

Arduino UNO: Arduino is an open-source prototyping platform based on easy-to-use hardware and software. Arduino boards are able to read inputs - light on a sensor, a finger on a button, or a Twitter message - and turn it into an output - activating a motor, turning on an LED, publishing something online. All this is defined by a set of instructions programmed through the Arduino Software (IDE).

LED matrix: A 4x4 LED matrix is a one in which it consists of 4 LED's in each row and each column totally 16 LED's. In a matrix format LEDs are arranged in rows and columns. You can also think of them as y and x coordinates. Let's assume we have 4×4 matrix. Rows would be marked from A to D and columns from 1 to 4. Now we can address each LED by row and column. Top left led would be (A, 1). Bottom down led would be (D, 4).

Led matrices come in two types. Common-row anode (left) and common-row cathode (right).

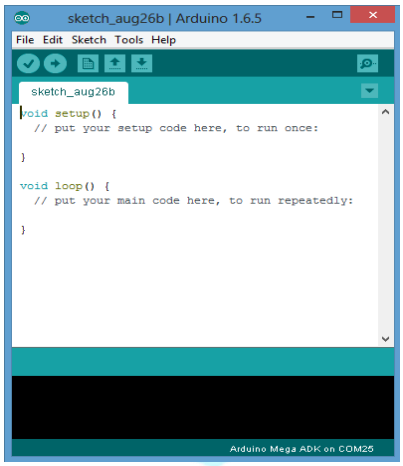
The difference between these two configurations is how you lit a led. With common-row anode current sources (positive voltage) are attached to rows A..D and currents sinks (negative voltage, ground) to columns 1..4. With common-row cathode current sinks are attached to rows A..D and currents sources to columns 1..4.

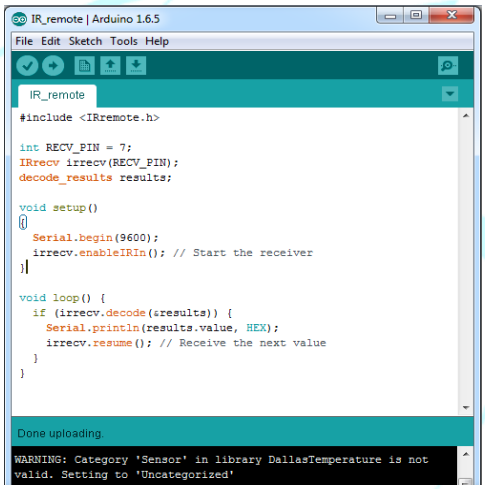
For example. To light bottom down led (D, 4) of common cathode matrix you would feed positive voltage to column 4 and connect row D to ground.

Step1. The Materials required are:

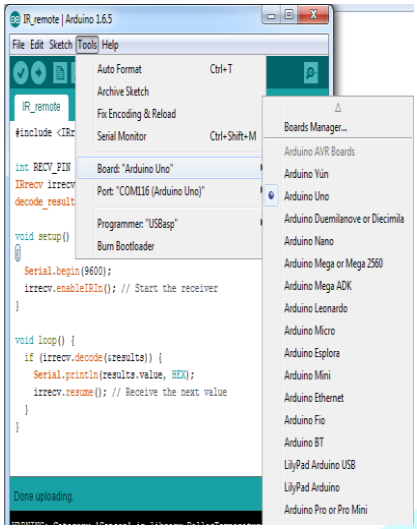
- Arduino UNO
- 4x4 LED matrix breakout
- Male to Female Jumpers

1. Open Arduino sketch on your PC or Laptop to start the programming.

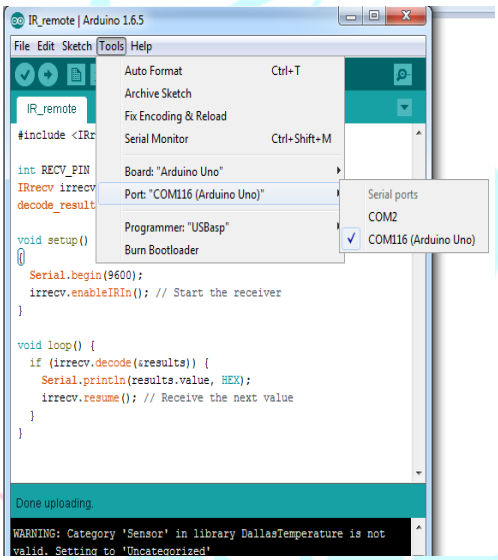




- Type the program for the 4x4 LED matrix in which it should display the LED's and only 4 LED's with inside should glow.
- Click on verify and check for any errors in the program. If no errors are present select the Arduino UNO in IDE. Go to tools> Board> Select Arduino UNO.

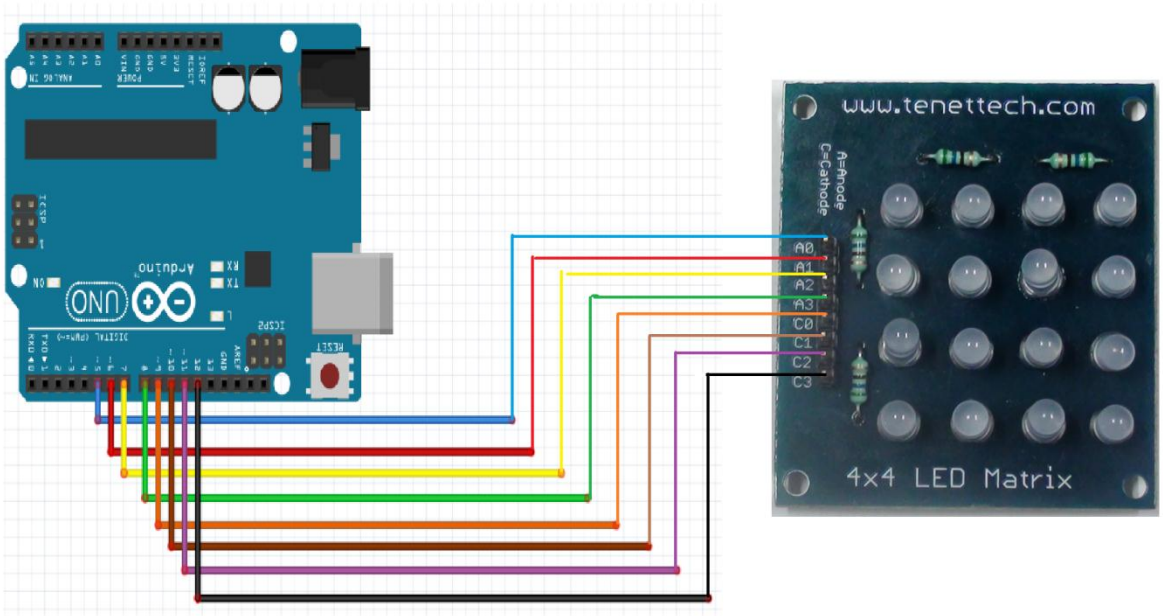


- Select port of programming by Tools> Port> Select the port for programming



- Now Upload the program to the arduino

Interfacing Arduino with 4x4 LED matrix:



Code:

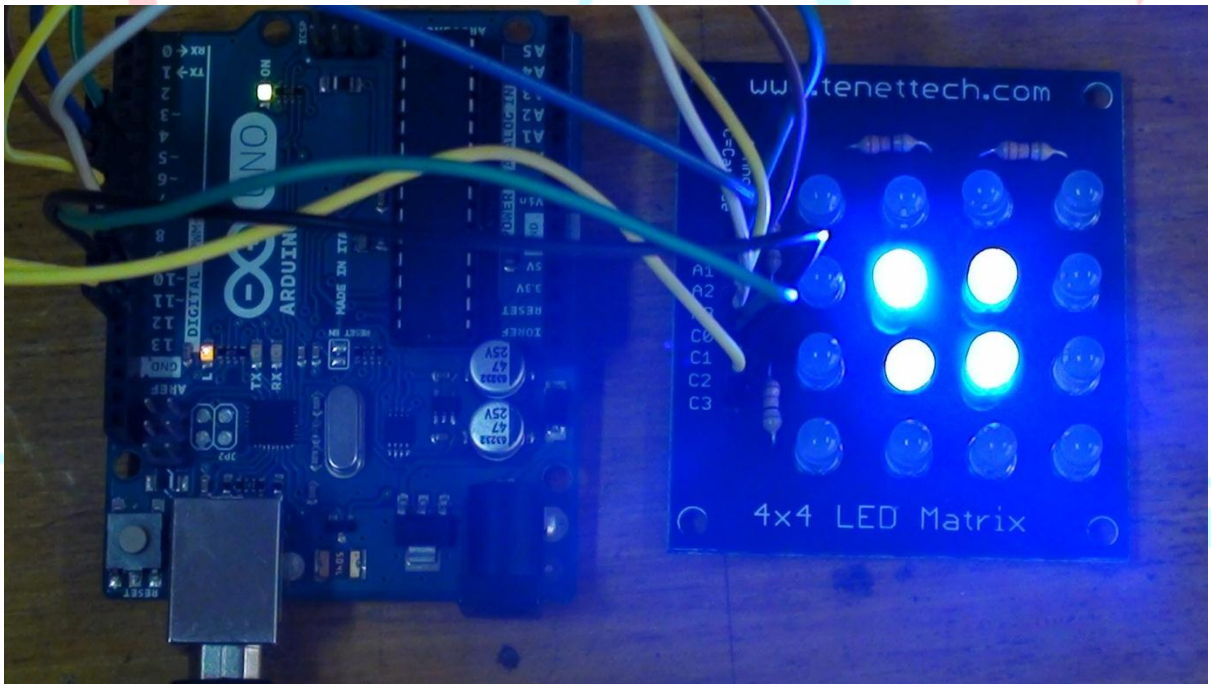
```
int row[] = {5,6,7,8};

// cathodes

int col[] = {9,10,11,12};



// bit patterns for each row

byte data[] = {

  0,0,0,0};



// defines the size of the matrix

int columns = 4;

int rows = 4;
```

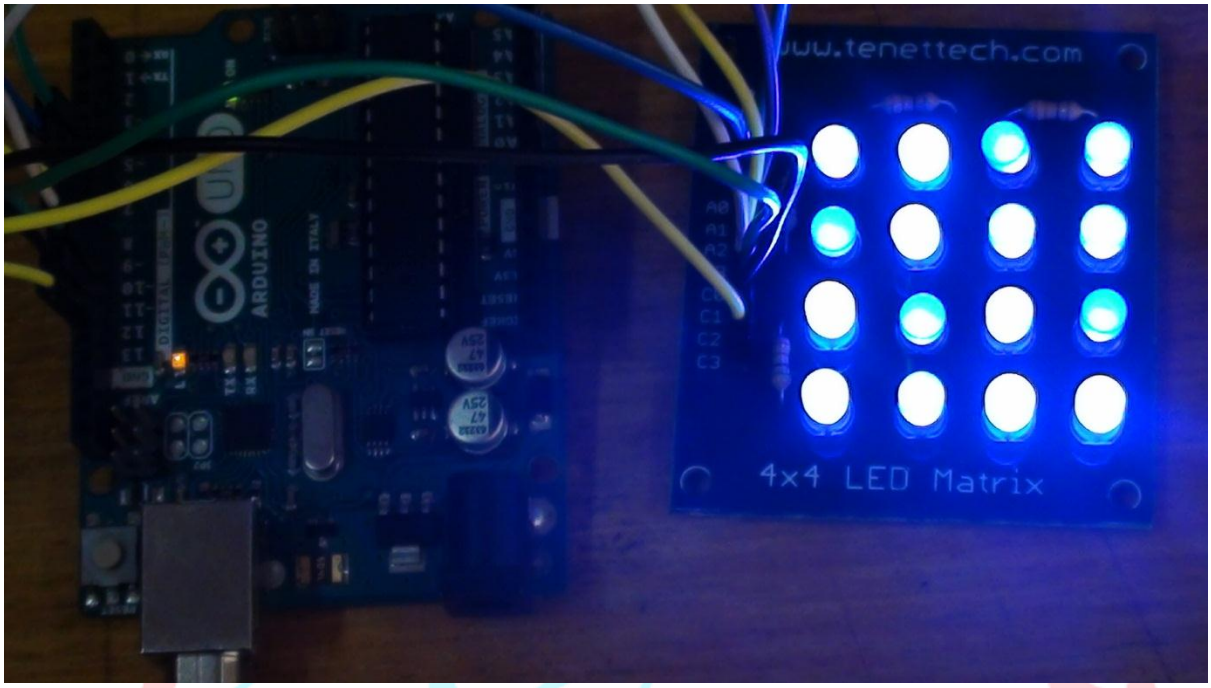
```
//millisecond delay between displaying each row
int pause = 1000;



void setup()
{
  for (int i=0;i<4;i++)
  {
    pinMode(row[i], OUTPUT);
    pinMode(col[i], OUTPUT);
  }
  allOff();
}


void loop()
{
  // define pattern
  data[0] = B11111111;
  data[1] = B11111111;
  data[2] = B11111111;
  data[3] = B11111111;
```

```
  showPattern();
}

void allOff()
{
  for (int i=0;i<4;i++)
  {
    digitalWrite(row[i], LOW);
    digitalWrite(col[i], HIGH);
  }
}


void showPattern()
{
  for (int thisrow=0;thisrow<rows;thisrow++)
  {
    //turn everything off
    allOff();
    //turn on current row
    digitalWrite(row[thisrow], HIGH);
    // loop through columns of this row and light
    for (int thiscol=0;thiscol<columns;thiscol++)
    {
      if (bitRead(data[thisrow],columns-thiscol-1)==1)
```

```
    {
      digitalWrite(col[thiscol], LOW);
    }
    else
    {
      digitalWrite(col[thiscol], HIGH);
    }
   }
   delay(pause);
  }
}
```

OUTPUT:





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For technical query please send an e-mail: info@tenettech.com

For product info:

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3.

9/3, 2nd floor, SreeLaksmi Complex, opp, to Vivekananda Park, Girinagar, Bangalore - 560085,

Email: info@tenettech.com, Phone: 080 - 26722726