# CHAPTER: 10 LED MATRIX

## PRACTICAL: 10A

**AIM:** To interface LED MATRIX to Arduino to display Alphabets from A to Z.

**ARDUINO CODE :**

```
 /**********************
 * Author: Shreejicharan
 * Title: To interface LED MATRIX to Arduino to display Alphabets from A to Z.
 * Email: shreejicharanelectronics@gmail.com
 **********************/
*/

#include <MaxMatrix.h>

int DIN = 12;   // DIN pin of MAX7219 module
int CLK = 10;   // CLK pin of MAX7219 module
int CS = 11;    // CS pin of MAX7219 module
int maxInUse = 1;

MaxMatrix m(DIN, CS, CLK, maxInUse);

const byte A[] = {7,7,          //4,8   HERE 4,8    IS     4 IS COLLOMN,,,,,,,8 IS ROW,,
          B00000000,
          B11001100,
          B11001100,
          B11111100,
          B11001100,
          B11001100,
          B01111000,
          B00110000
         };

const byte B[]={8,7,
          B11111100,
          B01100110,
          B01100110,
          B01111100,
          B01100110,
          B01100110,
          B11111100,
          B00000000
         };
```

```
const byte C[]={7,7,
        B00111100,
        B01100110,
        B11000000,
        B11000000,
        B01100110,
        B00111100,
        B00000000
        };

const byte D[]={7,7,
         B11111000,
         B01101100,
         B01100110,
         B01100110,
         B01100110,
         B01101100,
         B11111000,
         B00000000
         };

const byte E[]={7,7,
         B11111110,
         B01100010,
         B01101000,
         B01111000,
         B01101000,
         B01100010,
         B11111110,
         B00000000
         };

const byte F[]={7,7,
          B11111110,
          B01100010,
          B01100000,
          B01111000,
          B01100000,
          B01100000,
          B11110000,
          B00000000
          };
const byte G[]={    7,7,
          B00111100,
          B01100110,
          B11000000,
          B11001110,
          B01100110,
          B00111110,
          B00000000
```

```
 };

const byte H[]={  7,7,
          B11001100,
          B11001100,
          B11111100,
          B11111100,
          B11001100,
          B11001100,
          B11001100,
          B00000000
 };

const byte I[]={    7,7,
         B01111000,
          B00110000,
          B00110000,
          B00110000,
          B00110000,
          B00110000,
          B01111000,
          B00000000
 };


const byte J[]={7,7,
         B00011110,
          B00001100,
          B00001100,
          B00001100,
          B11001100,
          B11001100,
          B01111000,
          B00000000
 };

const byte K[]={7,7,
         B11100110,
         B01100110,
         B01101100,
         B01111000,
         B01101100,
         B01100110,
         B11100110,
         B00000000
    };


const byte L[]={7,7,
         B11110000,
```

```
        B01100000,
        B01100000,
        B01100000,
        B01100010,
        B01100110,
        B11111110,
        B00000000
 };

const byte M[]={7,7,
        B11000110,
        B11101110,
        B11111110,
        B11010110,
        B11000110,
        B11000110,
        B11000110,
        B00000000
 };

const byte N[]={7,7,
        B11000110,
        B11100110,
        B11110110,
        B11011110,
        B11001110,
        B11000110,
        B11000110,
        B00000000
        };

const byte O[]={7,7,
        B00111000,
        B01101100,
        B11000110,
        B11000110,
        B11000110,
        B01101100,
        B00111000,
        B00000000
        };

const byte P[]={7,7,
        B11111100,
        B01100110,
        B01100110,
        B01111100,
        B01100000,
        B01100000,
        B11110000,
```

```
        B00000000
 };

const byte Q[]={7,7,
        B01111000,
        B11001100,
        B11001100,
        B11001100,
        B11011100,
        B01111000,
        B00011100,
        B00000000
 };


const byte R[]={7,7,
         B11111100,
         B01100110,
         B01100110,
         B01111100,
         B01101100,
         B01100110,
         B11100110,
         B00000000
 };


const byte S[]={7,7,
        B01111000,
        B11001100,
        B11100000,
        B01110000,
        B00011100,
        B11001100,
        B01111000,
        B00000000
 };

const byte T[]={7,7,
         B11111100,
         B10110100,
         B00110000,
         B00110000,
         B00110000,
         B00110000,
         B01111000,
         B00000000
          };
```

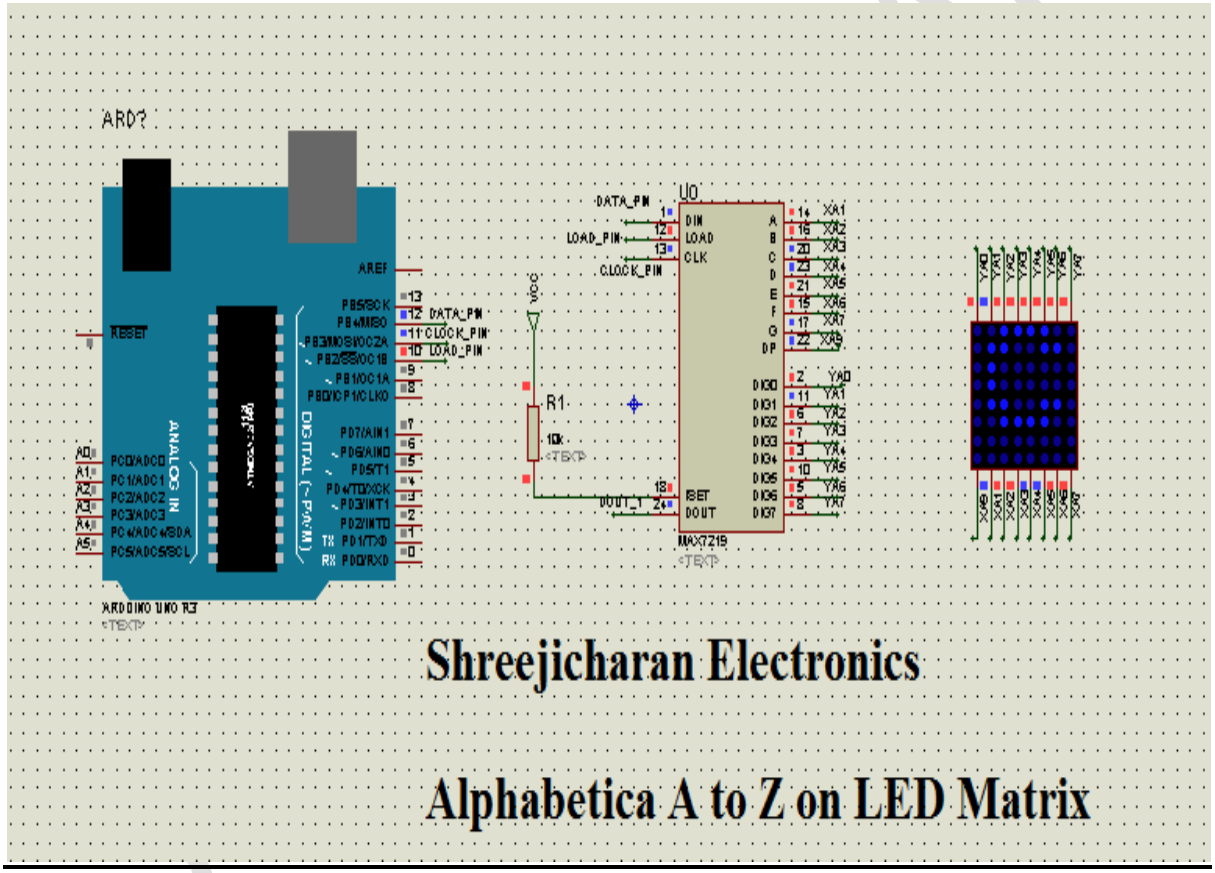
```
const byte U[]={  7,7,
          B11001100,
          B11001100,
          B11001100,
          B11001100,
          B11001100,
          B11001100,
          B01111100

 };


const byte V[]={7,7,
          B11001100,
          B11001100,
          B11001100,
          B11001100,
          B11001100,
          B01111000,
          B00110000,
          B00000000

 };

const byte W[]={7,7,
         B11000110,
         B11000110,
         B11000110,
         B11010110,
         B11111110,
         B11101110,
         B11000110,
         B00000000
 };

const byte X[]={7,7,
         B11000110,
         B11000110,
         B01101100,
         B00111000,
         B00111000,
         B01101100,
         B11000110,
         B00000000

 };

const byte Y[]={7,7,
        B11001100,
        B11001100,
```

```
        B11001100,
        B01111000,
        B00110000,
        B00110000,
        B01111000,
        B00000000
 };

const byte Z[]={7,7,
        B11111110,
        B11000110,
        B10001100,
        B00011000,
        B00110010,
        B01100110,
        B11111110,
        B00000000
 };
void setup()
{
  m.init(); // MAX7219 initialization
  m.setIntensity(8); // initial led matrix intensity, 0-15
}

void loop()
{

 m.writeSprite(0, 0, A);
 delay(1000);

 m.writeSprite(0, 0, B);
 delay(1000);

 m.writeSprite(0, 0, C);
 delay(1000);

 m.writeSprite(0, 0, D);
 delay(1000);

 m.writeSprite(0, 0, E);
 delay(1000);

 m.writeSprite(0, 0, F);
 delay(1000);

 m.writeSprite(0, 0, G);
 delay(1000);

 m.writeSprite(0, 0, H);
  delay(1000);
```

```
 m.writeSprite(0, 0, I);
 delay(1000);

m.writeSprite(0, 0,J);
 delay(1000);

m.writeSprite(0, 0,K);
 delay(1000);

m.writeSprite(0, 0,L);
delay(1000);

m.writeSprite(0, 0,M);
delay(1000);

m.writeSprite(0, 0,N);
delay(1000);

m.writeSprite(0, 0,O);
delay(1000);

m.writeSprite(0, 0,P);
delay(1000);

m.writeSprite(0, 0,Q);
delay(1000);

m.writeSprite(0, 0,R);
delay(1000);

m.writeSprite(0, 0,S);
delay(1000);

m.writeSprite(0, 0,T);
delay(1000);

m.writeSprite(0, 0,U);
delay(1000);

m.writeSprite(0, 0,V);
delay(1000);

m.writeSprite(0, 0,W);
delay(1000);

m.writeSprite(0, 0,X);
delay(1000);
```

```
 m.writeSprite(0, 0,Y);
 delay(1000);

 m.writeSprite(0, 0,Z);
 delay(1000);

 for (int i=0; i<9; i++)
{
   m.shiftLeft(false,false);
   delay(300);
  }
m.clear();
}
```

**SIMULATION:**



# CHAPTER: 10 LED MATRIX

## PRACTICAL: 10B

**AIM:** To interface LED MATRIX to Arduino to display 0 to 9 Numbers.

**ARDUINO CODE:**

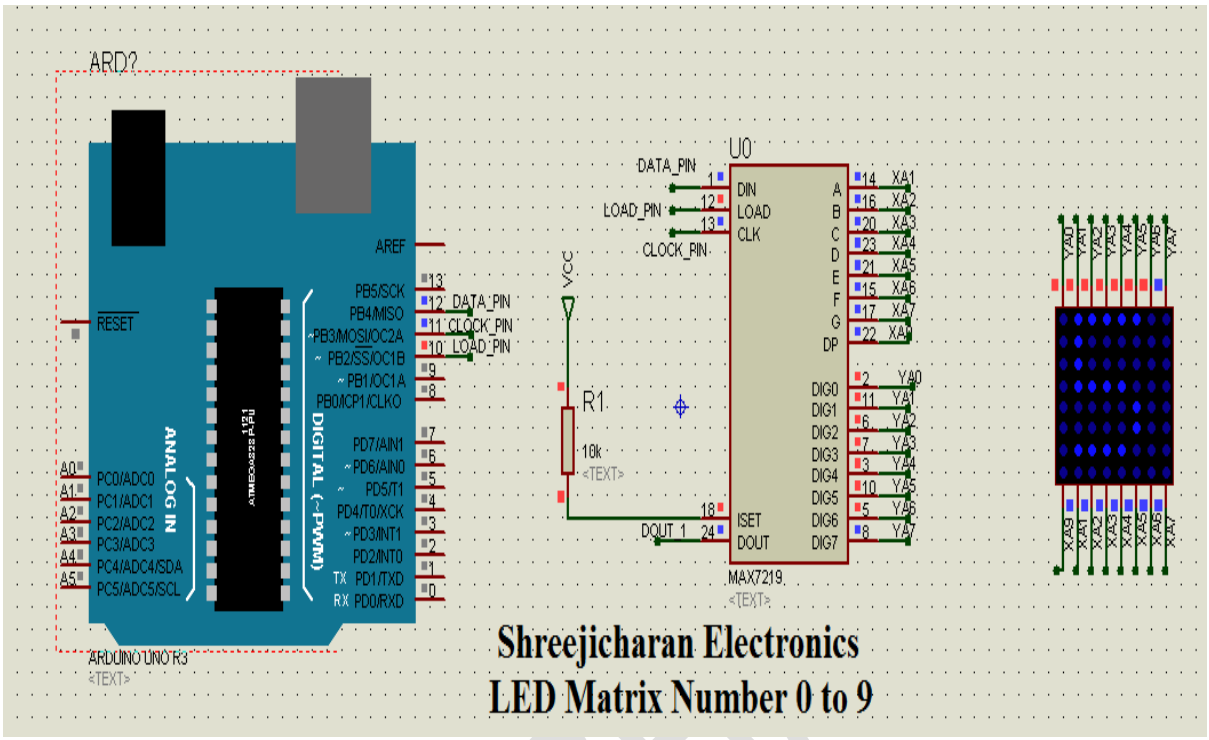
```
 /**********************
 * Author: Shreejicharan
 * Title: To interface LED MATRIX to Arduino to display 0 to 9 Numbers.
 * Email: shreejicharanelectronics@gmail.com
 **********************/
*/

#include <MaxMatrix.h>

int DIN = 12;   // DIN pin of MAX7219 module
int CLK = 11;   // CLK pin of MAX7219 module
int CS = 10;    // CS pin of MAX7219 module
int maxInUse = 1;

MaxMatrix m(DIN, CS, CLK, maxInUse);

const byte A[] ={7,7,
        B00111000,
        B01000100,
        B01001100,
        B01010100,
        B01100100,
        B01000100,
        B00111000,
        B00000000
};

const byte B[]={7,7,
          B00011000,
          B00110000,
          B01111000,
          B00011000,
          B00011000,
          B00011000,
          B00111100,
          B00000000

};
```

```
const byte C[]={7,7,
        B00111000,
        B01101100,
        B01000100,
        B00011100,
        B00111000,
        B01100000,
        B01111110,
        B00000000
};
const byte D[]={7,7,
        B00111000,
        B01000100,
        B00000100,
        B00011000,
        B00000100,
        B01000100,
        B00111000,
        B00000000
  };

const byte E[]=  {7,7,
         B00001000,
         B00011000,
         B00101000,
         B01001000,
         B01111100,
         B00001000,
         B00001000,
         B00000000
};

const byte F[]={7,7,
         B01111100,
         B01000000,
         B01000000,
         B01111000,
         B00000100,
         B00000100,
         B01111000,
         B00000000
};

const byte G[]={7,7,
        B00111000,
        B01000100,
        B01000000,
        B01111000,
        B01000100,
        B01000100,
```

```
        B00111000,
        B00000000
};

const byte H[]={7,7,

        B01111100,
        B00000100,
        B00000100,
        B00001000,
        B00010000,
        B00100000,
        B01000000,
        B00000000

};
const byte I[]={7,7,
        B00111000,
        B01000100,
        B01000100,
        B00111000,
        B01000100,
        B01000100,
        B00111000,
        B00000000
};

const byte J[]={7,7,
        B00111000,
        B01000100,
        B01000100,
        B00111100,
        B00000100,
        B01000100,
        B00111000,
        B00000000
};
void setup()
{
  m.init(); // MAX7219 initialization
  m.setIntensity(8); // initial led matrix intensity, 0-15
}

void loop()
{
  m.writeSprite(0, 0, A);
  delay(1000);

 for (int i=0; i<9; i++){
    m.shiftLeft(true,false);
```

```
    delay(30);
  }
  m.clear();
  m.writeSprite(0, 0, B);
  delay(1000);
 for (int i=0; i<8; i++){
    m.shiftLeft(true,true);
    delay(30);
  }

  m.writeSprite(0, 0, C);
  delay(1000);

  m.writeSprite(0, 0, D);
  delay(1000);

  m.writeSprite(0, 0, E);
  delay(1000);

  m.writeSprite(0, 0, F);
  delay(1000);

  m.writeSprite(0, 0, G);
  delay(1000);

  m.writeSprite(0, 0, H);
  delay(1000);

  m.writeSprite(0, 0, I);
  delay(1000);

  m.writeSprite(0, 0, J);
  delay(1000);

 for (int i=0; i<9; i++){
    m.shiftLeft(false,false);
    delay(300);
  }
  m.clear();
}
```

**SIMULATION:**


ARD?
AREF
RESET
PB5/SCK
PB4/MISO
PB3/MOSI/OC2A
PB2/SS/OC1B
PB1/OC1A
PB0/ICP1/CLKO
PD7/AIN1
PD6/AIN0
PD5/T1
PD4/T0/XCK
PD3/INT1
PD2/INT0
PD1/TXD
PD0/RXD
DATA_PIN
CLOCK_PIN
LOAD_PIN
ANALOG IN
DIGITAL (~PWM)
PC0/ADC0
PC1/ADC1
PC2/ADC2
PC3/ADC3
PC4/ADC4/SDA
PC5/ADC5/SCL
ATMEGA328P-PU
ARDUINO UNO R3
U0
DIN
LOAD
CLK
ISET
DOUT
DOUT_1
DIG0
DIG1
DIG2
DIG3
DIG4
DIG5
DIG6
DIG7
MAX7219
VCC
R1
10k
Shreejicharan Electronics
LED Matrix Number 0 to 9