Study of Arduino Uno interfacing with sensor LM35

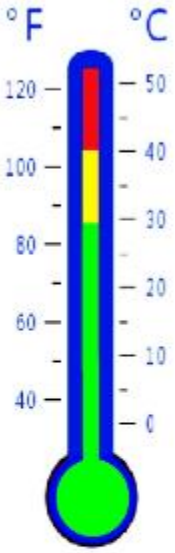
AIM: To study Arduino Uno interfacing with Sensor LM35.

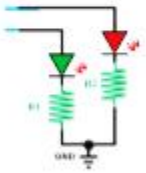
OBJECTIVES:

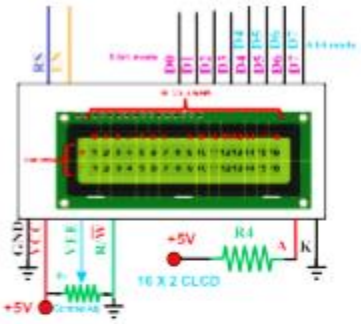
1. To understanding the basics of Arduino Uno and its Pin configuration.
2. To write an Arduino Uno program to sense the temperature from LM35 and display it on LCD.
3. To write an Arduino Uno program to Monitor the temperature, if temperature raises above the certain level (32 degree C) then turn on RED LED & fan and if it decreases below certain level turns on Green LED and off the Red LED & fan

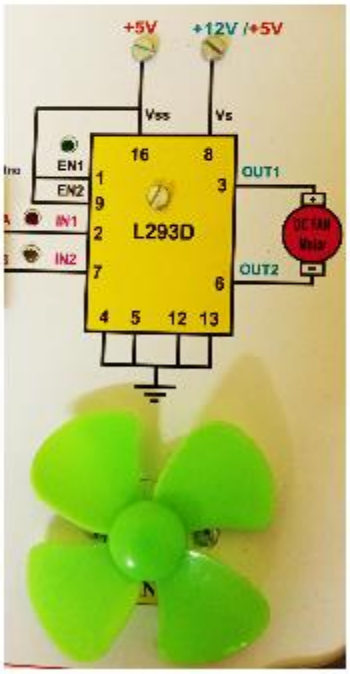
Circuit/ Block Diagram:

Sensor LM35 interfacing with Arduino Uno:









1. **Pin Connection**

sensor=A0

LCD. (RS, E, D4, D5, D6, D7)

Pins of lcd(6, 7, 5, 4, 3, 2)

Red_LED = 10

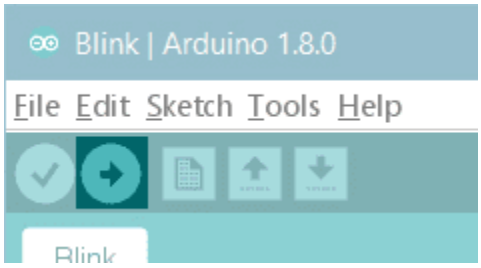
Green_LED = 11

Fan_P= 8

Fan_N=9

Procedure for Arduino Uno Programming: Arduino Uno IDE

a. Open new sketch, Write a program to interfacing sensor LM35 with Arduino and save it as "sensor.ino" filename.
b. Select your board type and port.
c. You'll need to select the entry in the Tools > Board menu that corresponds to your Arduino board. Select the serial device of the board from the Tools > Serial Port menu. This is likely to be COM3 or higher (COM1 and COM2 are usually reserved for hardware serial ports). To find out, you can disconnect your board and re-open the menu; the entry that disappears should be the Arduino board. Reconnect the board and select that serial port.
d. To Upload the program:
Now, simply click the "Upload" button in the environment. Wait a few seconds - you should see the RX and TX led's on the board flashing. If the upload is successful, the message "Done uploading." will appear in the status bar.



Program1:

```
#include<LiquidCrystal.h>

LiquidCrystal lcd(6, 7, 5, 4, 3, 2); //pins of the LCD. (RS, E, D4, D5, D6, D7)

const int sensor=A0; // Assigning analog pin A1 to variable 'sensor'
float tempc;  //variable to store temperature in degree Celsius
```

```
float tempf;  //variable to store temperature in Fahreinheit
float vout;  //temporary variable to hold sensor reading
int Red_LED = 10;
int Green_LED = 11;
int Fan_P= 8;
int Fan_N=9;
void setup()
{

pinMode(Red_LED, OUTPUT);
pinMode(Green_LED, OUTPUT);
pinMode(Fan_P, OUTPUT);
pinMode(Fan_N, OUTPUT);

pinMode(sensor,INPUT); // Configuring pin A1 as input
Serial.begin(9600);
lcd.begin(16,2);
  delay(500);
}
void loop()
{
char sign = 223;
vout=analogRead(sensor);
tempc = (vout*500)/1023;
//vout=vout* 0.48828125;
lcd.setCursor(0,0);
 lcd.print("***Tempeature***");
 lcd.setCursor(0,1);
 lcd.print(tempc);
 lcd.print(sign);
 lcd.print("C ");
 lcd.print(" ");
 lcd.print((tempc*1.8)+32);
 lcd.print(sign);
 lcd.print("F ");
delay(1000); //Delay of 1 second for ease of viewing in serial monitor

 if (tempc > 32)
    {
       digitalWrite(Red_LED, HIGH);
```

```
      digitalWrite(Fan_P, HIGH);
      digitalWrite(Fan_N, LOW);
      digitalWrite(Green_LED, LOW);

   }
   else if (tempc < 32)
   {
      digitalWrite(Green_LED, HIGH);
      digitalWrite(Fan_P, LOW);
      digitalWrite(Fan_N, LOW);
      digitalWrite(Red_LED, LOW);
   }


}
```