**III. IMPLEMENTATION**

**Steps for Implementation:**

**Step 1 : Gather all these components** Components required

* [Arduino UNO](https://robu.in/?category=&s=arduino+uno&search_posttype=product)
* USB A to B
* Breadboard
* [DHT11 sensor](https://robu.in/?category=&s=dht11&search_posttype=product)
* [DC Fan](https://robu.in/?category=&s=5v+fan&search_posttype=product)
* [2n2222 transistor](https://robu.in/product/2n2222-npn-transistor-pack-of-20/)
* [16x2 LCD](https://robu.in/?category=&s=16x2&search_posttype=product)
* [Connecting wires](https://robu.in/product/10-cm-40-pin-dupont-male-male-male-female-female-female-cable-combo/)

**Step 2 : LCD connection with Arduino**

LCD is directly connected to Arduino (Check this tutorial for more details: [LCD Interfacing with Arduino Uno](https://robu.in/lcd-interfacing-with-arduino/)). Connect pins of LCD- RS, EN, D4, D5, D6, and D7 to Arduino's digital pin numbers 7, 6, 5, 4, 3, and 2.

**Step 3 : DHT 11 temperature and humidity sensor connection**

And a DHT11 sensor module is also connected to digital pin 12 of Arduino. Digital pin 9 is used for controlling fan speed through the transistor.

**Step 4: Upload the code**

The below section is for the code. Here the first table gives you an idea of what PWM value will be the speed of the fan. You can change values according to your need.

**Write the Arduino Code:**

//Robu.in

#include "DHT.h"

#include<LiquidCrystal.h>

LiquidCrystal lcd(7, 6, 5, 4, 3, 2);

#define DHTPIN 12 // what pin we're connected to

#define DHTTYPE DHT11 // DHT 11

#define pwm 9

byte degree[8] =

{

0b00011,

0b00011,

0b00000,

0b00000,

0b00000,

0b00000,

0b00000,

0b00000

};

// Initialize DHT sensor for normal 16mhz Arduino

DHT dht(DHTPIN, DHTTYPE);

void setup() {

lcd.begin(16, 2);

lcd.createChar(1, degree);

lcd.clear();

lcd.print(" Fan Speed ");

lcd.setCursor(0,1);

lcd.print(" Controlling ");

delay(2000);

analogWrite(pwm, 255);

lcd.clear();

lcd.print("Robu ");

delay(2000);

Serial.begin(9600);

dht.begin();

}

void loop() {

// Wait a few seconds between measurements.

delay(2000);

// Reading temperature or humidity takes about 250 milliseconds!

// Sensor readings may also be up to 2 seconds 'old' (its a very slow sensor)

float h = dht.readHumidity();

// Read temperature as Celsius

float t = dht.readTemperature();

// Read temperature as Fahrenheit

float f = dht.readTemperature(true);

// Check if any reads failed and exit early (to try again).

if (isnan(h) || isnan(t) || isnan(f)) {

Serial.println("Failed to read from DHT sensor!");

return;

}

// Compute heat index

// Must send in t in Fahrenheit!

float hi = dht.computeHeatIndex(f, h);

Serial.print("Humidity: ");

Serial.print(h);

Serial.print(" %\t");

Serial.print("temperature: ");

Serial.print(t);

Serial.print(" \*C ");

Serial.print(f);

Serial.print(" \*F\t");

Serial.print("Heat index: ");

Serial.print(hi);

Serial.println(" \*F");

lcd.setCursor(0,0);

lcd.print("temp: ");

lcd.print(t); // Printing terature on LCD

lcd.print(" C");

lcd.setCursor(0,1);

if(t <20 )

{

analogWrite(9,0);

lcd.print("Fan OFF ");

delay(100);

}

else if(t==26)

{

analogWrite(pwm, 51);

lcd.print("Fan Speed: 20% ");

delay(100);

}

else if(t==20)

{

analogWrite(pwm, 102);

lcd.print("Fan Speed: 40% ");

delay(100);

}

else if(t==28)

{

analogWrite(pwm, 153);

lcd.print("Fan Speed: 60% ");

delay(100);

}

else if(t==29)

{

analogWrite(pwm, 204);

lcd.print("Fan Speed: 80% ");

delay(100);

}

else if(t>29)

{

analogWrite(pwm, 255);

lcd.print("Fan Speed: 100% ");

delay(100);

}

delay(3000);

}