

CHANDIGARH UNIVERSITY

UNIVERSITY INSTITUTE OF ENGINEERING
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING



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UID	20BCS5323
BRANCH	BE CSE
SUBJECT	IOT LAB
SECTION	20BCS_DM_607-A

LAB INDEX

Sr. No	PROGRAM	DATE	Evaluation				SIGN
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AIM: -

Interfacing of Arduino/Raspberry Pi with temperature and humidity sensor with real time application and display data generated by sensor on LCD Display.

OBJECTIVE:-

- ❖ Learn about IoT based simulations.
- ❖ Testing and model in IoT based simulation platform

HARDWARE REQUIREMENT:-

- Arduino Uno R3 Board
- Jumper Wires
- DH11 Temperature and Humidity Sensor
- Breadboard
- LCD 16x2

SOFTWARE REQUIREMENT:-

- Windows 10 or higher
- Web Browser
- Arduino IDE

INTRODUCTION:-

Arduino:-

It is an open-source electronics platform. It consists ATmega328 8-bit Micro controller. It can be able to read inputs from different sensors & we can send instructions to the micro controller in the Arduino. It provides Arduino IDE to write code & connect the hardware devices like Arduino boards & sensors.

DH11 Temperature & Humidity Sensor:-

DHT11 Module features a temperature & humidity sensor complex with a calibrated digital signal output. The exclusive digital-signal-acquisition technique and temperature & humidity sensing technology ensure high reliability and excellent long-term stability. This sensor includes an NTC for temperature

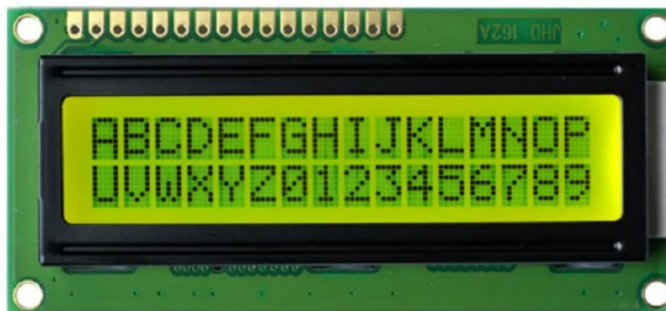


measurement and a resistive-type humidity measurement component for humidity measurement.

LCD Display:-

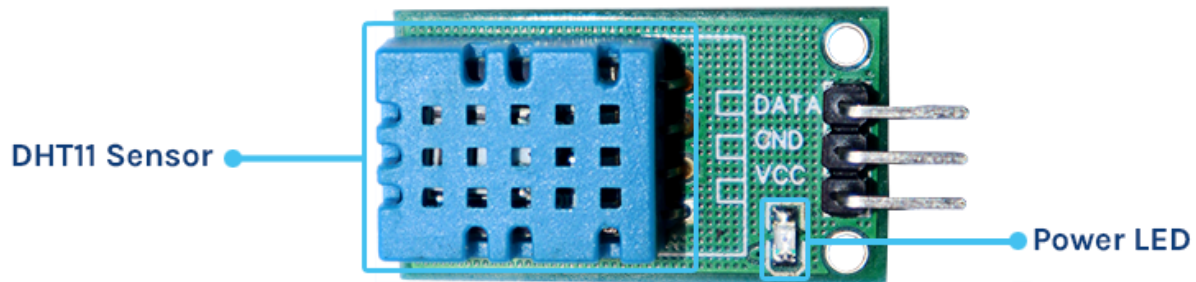
A liquid Crystal Display commonly abbreviated as LCD is basically a display unit built using Liquid Crystal technology. When we build real life/real world electronics-based projects, we need a medium/ device to display output values and messages. The most basic form of electronic display available is seven segment display, which has its own limitations. The next best available option is LCD which comes in different size specifications. Out of all available LCD modules in market, the most commonly used one is 16x2 LCD module which can display 32 ASCII characters in 2 lines.

16x2 LCD Module Pin Out Diagram:-

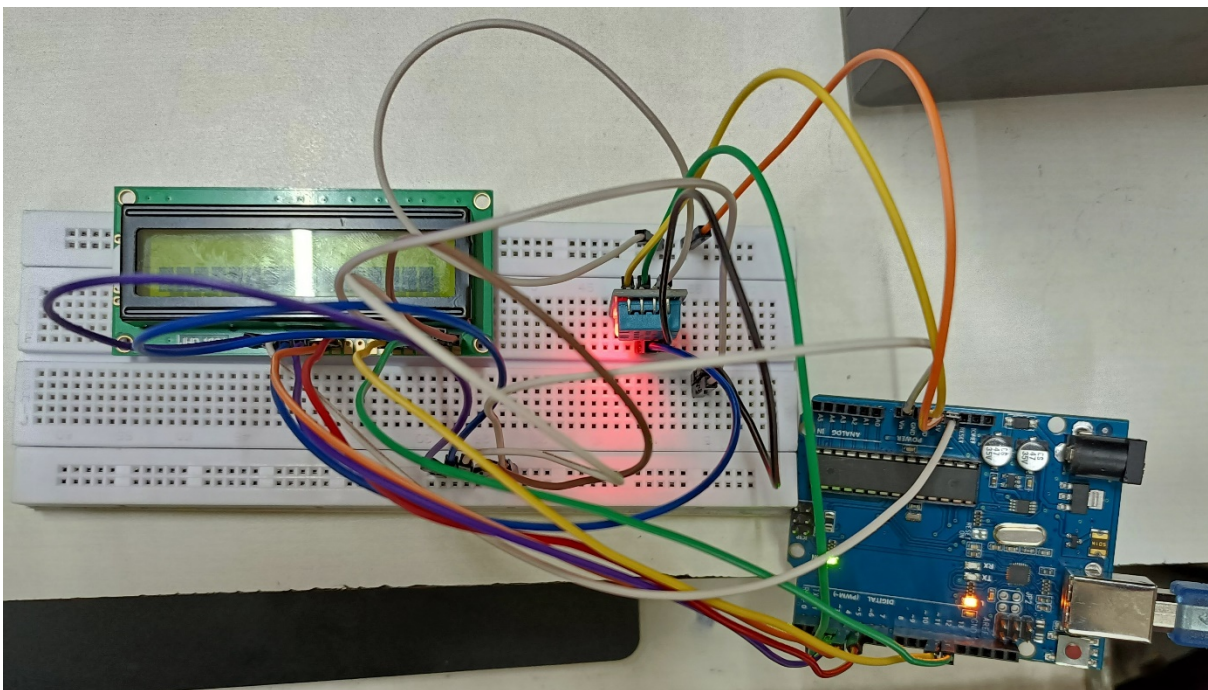


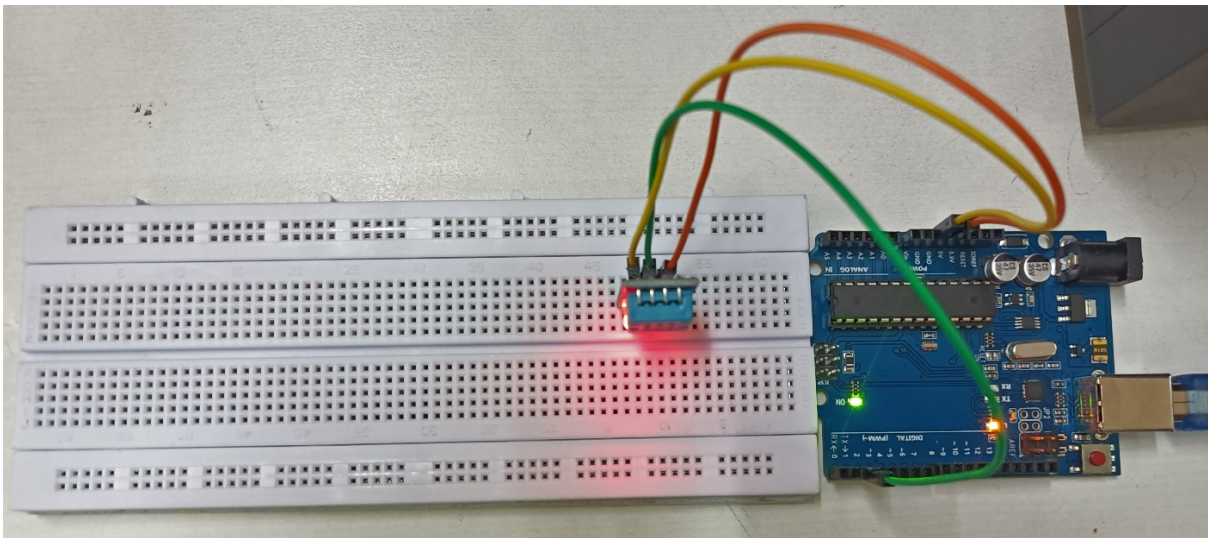
DHT11 MODULE CIRCUIT DIAGRAM:-

The schematic diagram for the DHT11 module is given below. As mentioned earlier, the board has a very low components count. The VCC and GND are directly connected to the DHT11 and a pullup resistor is added to the DATA pin. Sufficient filtering is provided with the tantalum and multilayer capacitors. An LED with a current limiting resistor is used as a power indicator.



CIRCUIT DIAGRAM:-





[In Lab Representation of Circuit]

• **CODE BLOCK :-**

```
#include <LiquidCrystal.h>

int vcc=A0;
int sensor=A1;
int gnd=A2;
float temp;
float tempf;

LiquidCrystal lcd(12, 11, 5, 4, 3, 2);

void setup()
{
    pinMode(vcc,OUTPUT);
    pinMode(sensor,INPUT);
    pinMode(gnd,OUTPUT);
    digitalWrite(vcc,HIGH);
    digitalWrite(gnd,LOW);
    lcd.begin(16, 2);
    lcd.setCursor(2,0);
    lcd.print("TEMPERATURE");
}

void loop()
{
```



```
temp=analogRead(sensor);  
temp=temp*5;  
temp=temp/10;  
tempf=(temp*1.8)+32;  
  
lcd.setCursor(0,1);  
lcd.print(temp);  
lcd.print((char)223);  
lcd.print("C");  
lcd.setCursor(8,1);  
lcd.print(tempf);  
lcd.print((char)223);  
lcd.print("F");  
delay(1000);  
}
```

OUTPUT :-





The screenshot shows the Arduino IDE Serial Monitor window. The title bar includes 'Output' and 'Serial Monitor' with a close button. The text area displays the following data:

```
m
Distance: 0 cm
Distance: 0 cm
Distance: 0 cm
Temperature: 27.10°C
Humidity: 41.00%
Temperature: °CTemperature: 27.20°C
Humidity: 44.00%
TemerTemperature: 27.20°C
Humidity: 45.00%
Temperre:Temperature: 27.10°C
Humidity: 42.00%
Temperature: 27.60°C
Humidity: 73.00%
TeTemperature: 27.10°C
Humidity: 43.00%
Temperatu27Temperature: 27.60°C
Humidity: 45.00%
```

The status bar at the bottom right indicates 'Ln 11, Col 15'.

To program the Arduino in Arduino IDE:

- a) Open Arduino IDE
- b) Create New Arduino Script
- c) Now enter the code according to the circuit
- d) We can start the code by click on compile button.