CSE 130 :IOT – 1
SMART AGRICULTURE WITH IOT

E0322026 -RISHITHA THOKA/YEAR–I/AIDA

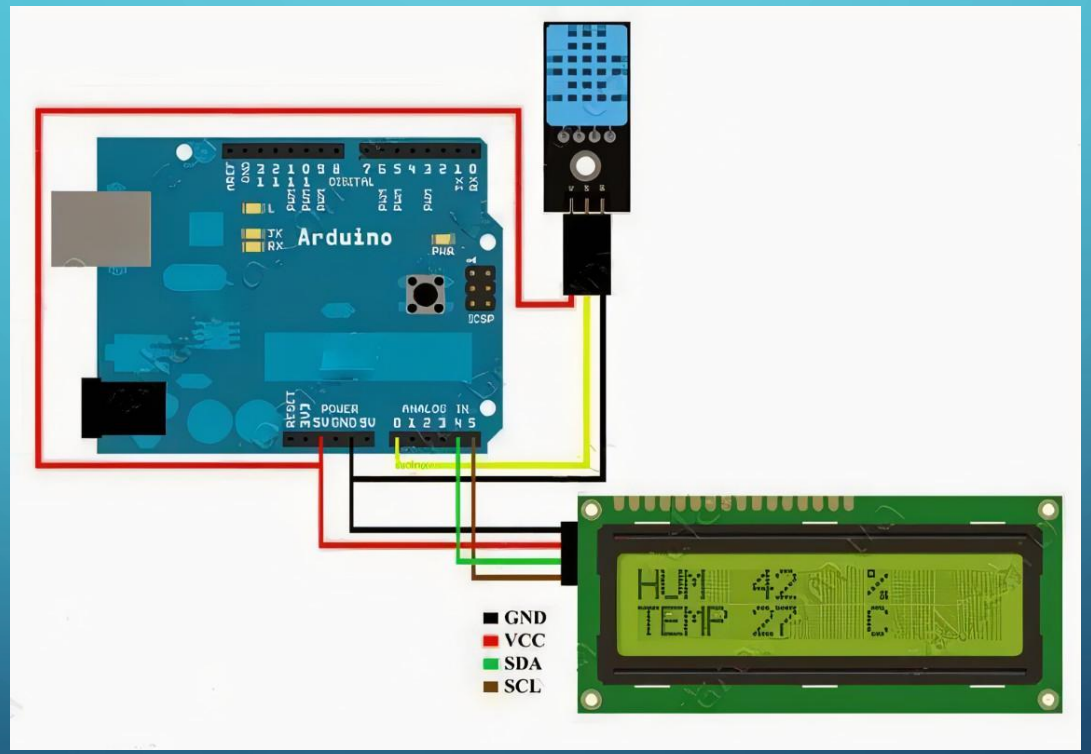
WHAT IS SMART AGRICULTURE IN IOT?

- IOT smart farming solutions is a system that is built for monitoring the crop field with the help of sensors (light, humidity, temperature, soil moisture, crop health, etc.) and automating the irrigation system.
- With the implementation of IoT in agriculture, processes are managed more effectively in the field. With the aid of sensors, for example, it is possible to monitor soil quality, humidity, temperature, automate the irrigation process, and others.
- In this way, farmers are able to monitor crop conditions remotely, and better manage natural resources. Therefore, smart agriculture is much more effective than traditional agriculture.

OBJECTIVES

- ✓To find Humidity and Temperature using DHT11 sensor
- ✓To find the light intensity using LDR module
- ✓To find the moisture in the surroundings by using soil moisture sensor

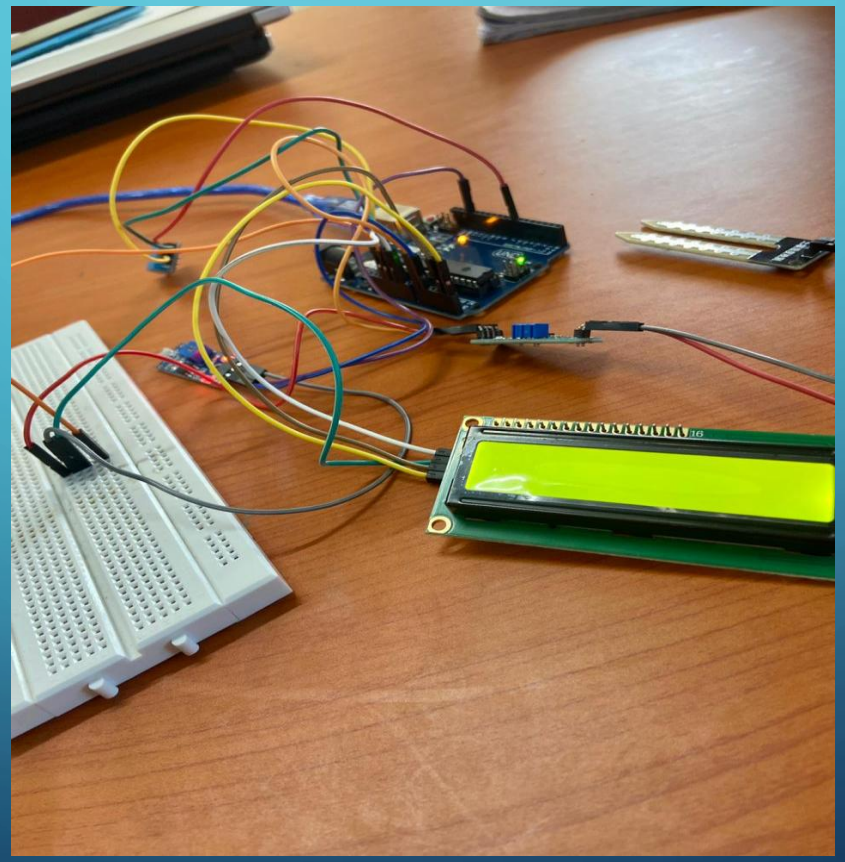
CIRCUIT CONNECTION



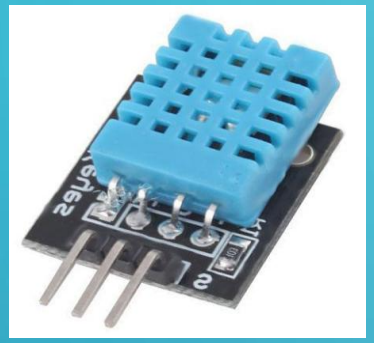
PIN CONNECTION

- ✓ DHT 11 positive is connected to pin 13 .
- ✓ DHT 11 negative is connected to GND.
- ✓ DHT 11 wiper is connected to 5v through breadboard.
- ✓ Soil moisture sensor AO is connected to A0 tin.
- ✓ Soil moisture VCC is connected to 5v through breadboard.
- ✓ LDR module DO is connected to A1 pin.
- ✓ LDR module VCC is connected to 5v through breadboard.
- ✓ LDR module wiper is connected to GND.
- ✓ 16*2 LCD display with i2c adapter GND is connected to ardiuno GND.
- ✓ 16*2 LCD display with i2c adapter VCC is connected to 5v through breadboard.
- ✓ 16*2 LCD display with i2c adapter SDA is connected to A4 pin.
- ✓ 16*2 LCD display with i2c adapter SCL is connected to A5 pin.

WORKING

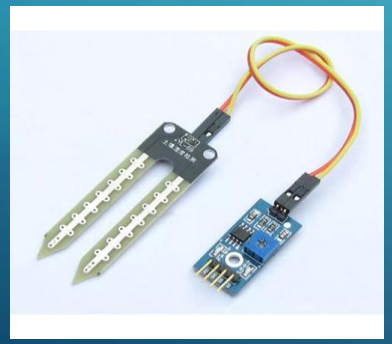


WORKING PROTOTYPE



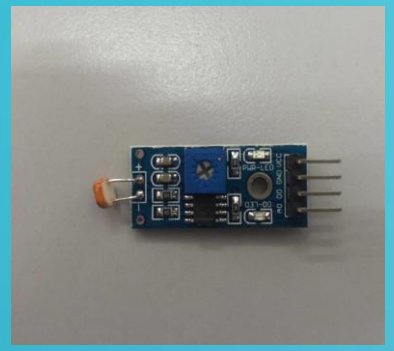
DHT 11

- The **DHT11** is a commonly used **Temperature and humidity sensor that** comes with a dedicated NTC to measure temperature and an 8-bit microcontroller to output the values of temperature and humidity as serial data.



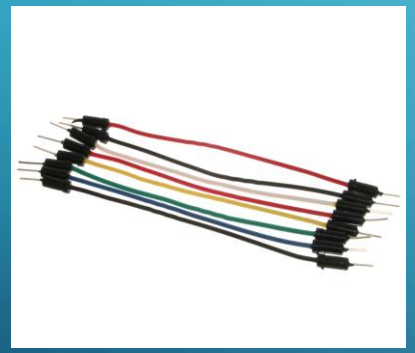
SOIL MOISTURE SENSOR

- This **soil moisture sensor module** is used to detect the moisture of the soil. It measures the volumetric content of water inside the soil and gives us the moisture level as output.



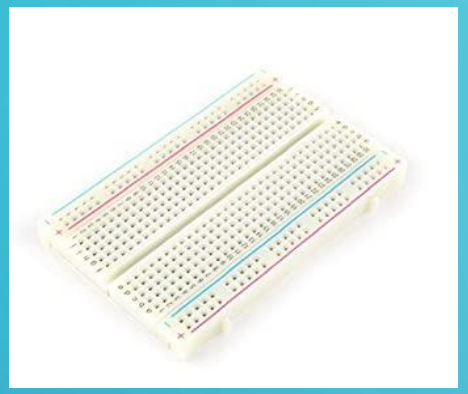
LDR MODULE

- Used to detect the presence of light / measuring the intensity of light.



JUMPER WIRES

- An electric wire that connects remote electric circuits used for printed circuit boards



BREADBOARD

- A solderless device for temporary prototype with electronics and test circuit designs.
- A breadboard is used to make up **temporary circuits** for testing or to try out an idea. No soldering is required so it is easy to change connections and replace components. Parts are not damaged and can be re-used afterwards.

ARDUINO UNO

- Mostly used by the beginners that can use in electronics project and do programming in this board.

LCD display with I2C adapter

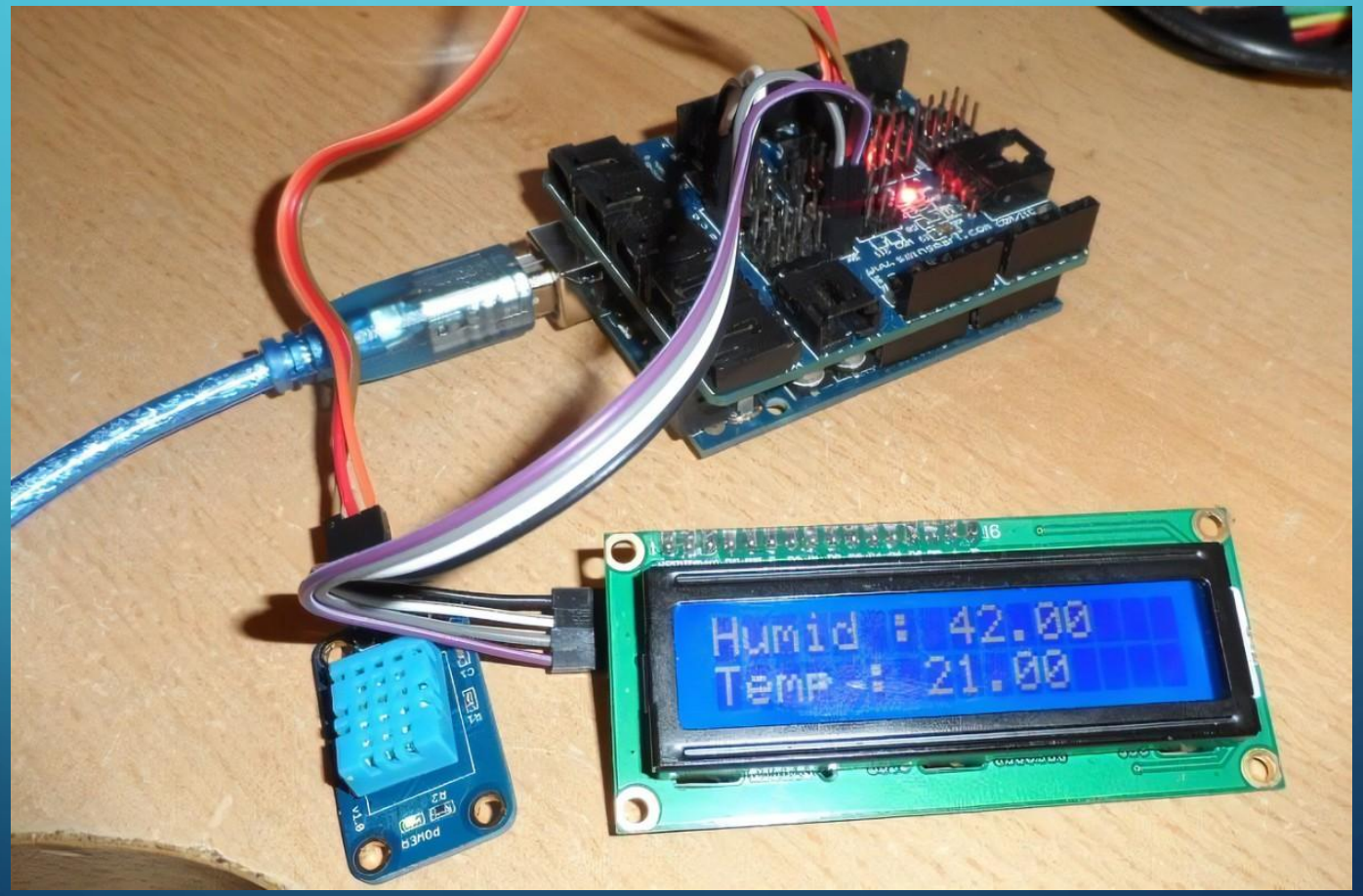
- 16 x 2 LCD is a perfect I2C LCD display for Arduino and Raspberry Pi with high contrast and easy deployment.
- 16x2 means two lines and each line has 16 columns, 32 characters in total.
- used to establish communication between two or more ICs (Integrated Circuits)

CODE

```
#include <LiquidCrystal_I2C.h>
#include<dht.h>
dht DHT;
float hum;
float temp;
LiquidCrystal_I2C dis(0x27, 16, 2);
 void setup() {
  Serial.begin(9600);
  dis.init();
  dis.backlight();
  dis.clear();
  dis.setCursor(0, 0);
  dis.print("IRRIGATION");
  dis.setCursor(0, 1);
  dis.print("SYSTEM IS ON ");
  for (int a = 12; a <= 15; a++) {
    dis.setCursor(a, 1);
    dis.print(".");
    delay(1500);
  }
  dis.clear();
}
```

```
void loop() {
  int value = analogRead(A0);
  Serial.println(value);
  if (value > 950) {
    digitalWrite(2, LOW);
    dis.setCursor(0, 0);
    dis.print("MOTOR IS ON ");
  } else {
    digitalWrite(2, HIGH);
    dis.setCursor(0, 0);
    dis.print("MOTOR IS OFF");
  }
  if (value < 300) {
    dis.setCursor(0, 1);
    dis.print("MOISTURE : HIGH");
  } else if (value > 300 && value < 950) {
    dis.setCursor(0, 1);
    dis.print("MOISTURE : MID ");
  } else if (value > 950) {
    dis.setCursor(0, 1);
    dis.print("MOISTURE : LOW ");
  }
  int chk = DHT.read11(DHT11_PIN);
  hum = DHT.humidity;
  temp= DHT.temperature;
  lcd.setCursor(0,0);
  lcd.print("Humidity:   ");
  lcd.print(hum);
  lcd.print("%");
  lcd.setCursor(0,1);
  lcd.print("Temp: ");
  lcd.print(temp);
  lcd.println("Celcius");
  delay(2000);
}
```

OUTPUT



APPLICATIONS

- Crop water management.
- To increase the productivity of crops .
- Efficiency resource utilization.
- Reduce cost of production.
- Smart monitoring.
- Better quality products.

REFERENCES

- IoT based Smart Agriculture Monitoring System – DIY Electronics Projects (electronics-project-hub.com)
- https//:www.wikipedia.org
- https//:www.thingspeak.com
- https//:www.youtube.com

THANK YOU