



East West University
Department of Computer Science and Engineering (CSE)
Semester: Fall 2025
B.Sc. in CSE

LAB 01

Course Title: Internet of Things
Course Code: CSE 406
Section: 01

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Submission Date: 06/10/25

Overview:

The first day in the lab was more about creating interest and learning the basics that we would need to learn what are the specifications of arduino, sensors, about arduino IDE and how we can use arduino and sensors, connect them using the software.

Equipment:

- 1.Arduino
- 2.DHT sensor
- 3.Water Sensor

Project Description:

Project 1 :

The first project was more about getting accustomed to the Arduino IDE. First created a HalloWorld file and learned about the two functions void setup() and void loop() functions that are shown in the ide.

void setup():

Execution: Runs only once at the start of the program.

Purpose: Used for initialization tasks.

Examples:

Setting pin modes (input or output) using pinMode().

void loop():

Execution: Runs repeatedly after void setup() completes, creating a continuous loop.

Purpose: Contains the main logic and functionality of the program.

Examples:

Reading sensor values.

Controlling actuators (motors, LEDs, etc.).

Performing calculations and making decisions

Project 2:

Lights:

There are some inbuilt LED lights in the arduino. Also there are pre used codes in the arduino libraries that we can use just by importing no need to write it again.

The code's screenshot is given here

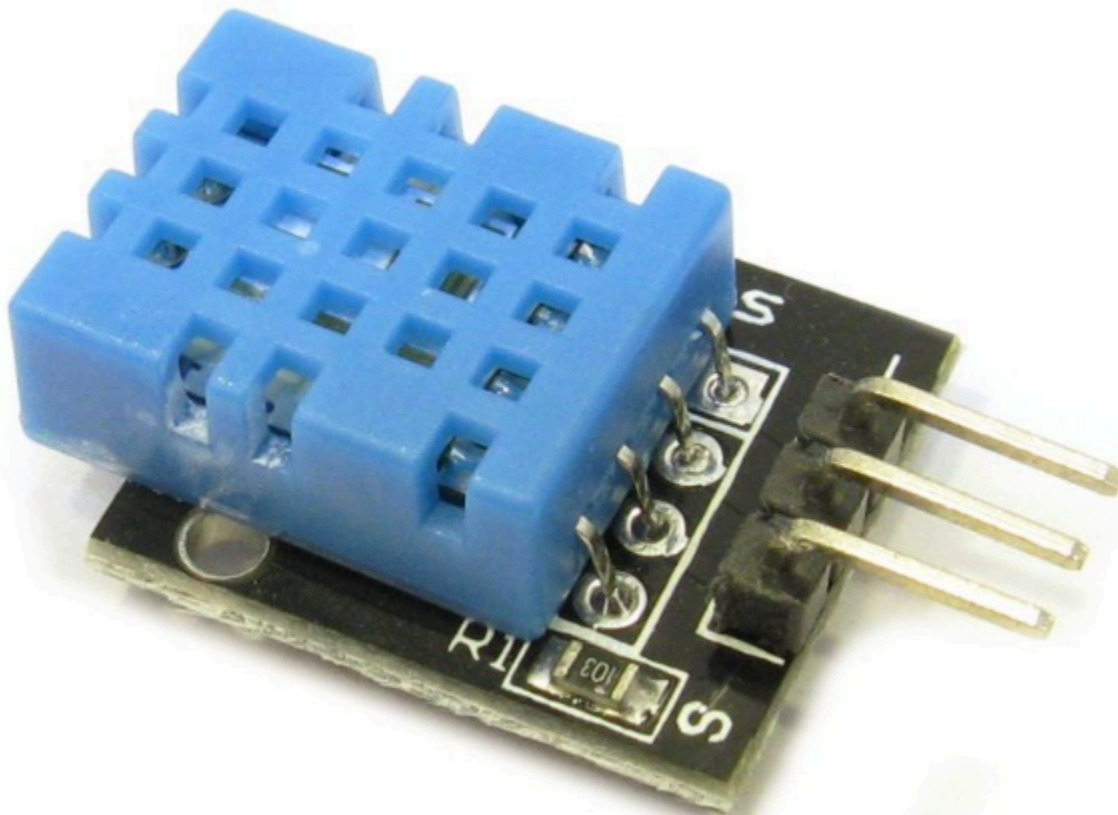
```
// the setup function runs once when you press reset or power the board
void setup() {
  // initialize digital pin LED_BUILTIN as an output.
  pinMode(LED_BUILTIN, OUTPUT);
}

// the loop function runs over and over again forever
void loop() {
  digitalWrite(LED_BUILTIN, HIGH); // turn the LED on (HIGH is the voltage level)
  delay(2000);                      // wait for a second
  digitalWrite(LED_BUILTIN, LOW);  // turn the LED off by making the voltage LOW
  delay(2000);                      // wait for a second
}
```

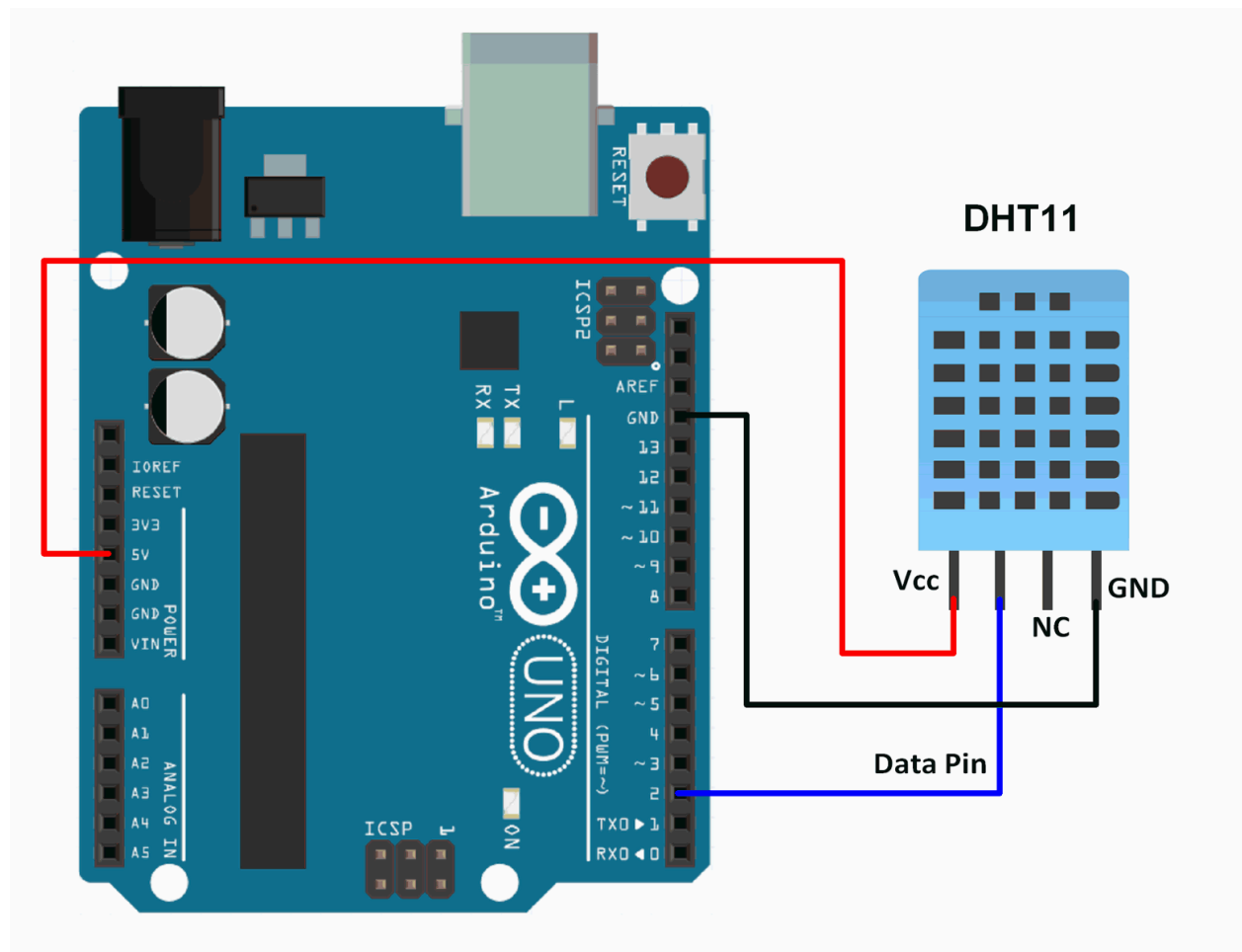
As we can see there is a delay 2 to be exact. Delay(2000) is creating a delay of 2 sec same for the second one so we have a total 4 sec delay.

Project 3:

DHT tester.



This was more of an interesting project where we used a DHT sensor. Dht sensors are used to learn about temperature and humidity around us.



Process:

First as shown in the picture we had to make sure the + side of the sensor was connected to the Vcc and the - pin of the sensor was connected to the 3V/5V female pin of the arduino. Though we used a 3V female pin and a male to female wire to connect them. Then we had to make sure the arduino is getting the digital signal from the Dht sensor and that's why we connected to the digital female arduino port with the sensor using a wire. After that we had to compile the code and put the code in the arduino to make sure that the code did not exceed the limit of the device.

Learnings:

1. Well we learned how to use sensors for the first time with an arduino.
2. The value of optimization because the memory in arduino is limited.

Code:

```

// Reading temperature or humidity takes about 250 millis
// Sensor readings may also be up to 2 seconds 'old' (its
float h = dht.readHumidity();
// Read temperature as Celsius (the default)
float t = dht.readTemperature();
// Read temperature as Fahrenheit (isFahrenheit = true)
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(F("Failed to read from DHT sensor!"));
    return;
}


// Compute heat index in Fahrenheit (the default)
float hif = dht.computeHeatIndex(f, h);
// Compute heat index in Celsius (isFahreheit = false)
float hic = dht.computeHeatIndex(t, h, false);

Serial.print(F("Humidity: "));
Serial.print(h);
Serial.print(F("%  Temperature: "));
Serial.print(t);
Serial.print(F("°C "));
Serial.print(f);
Serial.print(F("°F  Heat index: "));
Serial.print(hic);
Serial.print(F("°C "));
Serial.print(hif);
Serial.println(F("°F"));

```

This part in code in void loop() shows that we are taking a float data of humidity, temperature in both celsius and fahrenheit and printing it.

```
3  #include "DHT.h"
4
5  #define DHTPIN 2    // Digital pin connected to the DHT sensor
6  // Feather HUZZAH ESP8266 note: use pins 3, 4, 5, 12, 13 or 14 --
7  // Pin 15 can work but DHT must be disconnected during program upload.
8
9  // Uncomment whatever type you're using!
10 #define DHTTYPE DHT11  // DHT 11
11 // #define DHTTYPE DHT22  // DHT 22  (AM2302), AM2321
12 // #define DHTTYPE DHT21  // DHT 21 (AM2301)
13
14 // Connect pin 1 (on the left) of the sensor to +5V
15 // NOTE: If using a board with 3.3V logic like an Arduino Due connect pin 1
16 // to 3.3V instead of 5V!
17 // Connect pin 2 of the sensor to whatever your DHTPIN is
18 // Connect pin 3 (on the right) of the sensor to GROUND (if your sensor has 3 pins)
19 // Connect pin 4 (on the right) of the sensor to GROUND and leave the pin 3 EMPTY (if your sens
20 // Connect a 10K resistor from pin 2 (data) to pin 1 (power) of the sensor
21
22 // Initialize DHT sensor.
23 // Note that older versions of this library took an optional third parameter to
24 // tweak the timings for faster processors.  This parameter is no longer needed
25 // as the current DHT reading algorithm adjusts itself to work on faster procs.
26 DHT dht(DHTPIN, DHTTYPE);
27
28 void setup() {
29     Serial.begin(9600);
30     Serial.println(F("DHTxx test!"));
31
32     dht.begin();
33 }
```

 Do you want to install the recommended 'C/ Pack' extension from Microsoft for the C++ I

[Install](#)

In this code we are defining the port and doing the basic setup in the void setup() function.

Project 4:

Water Sensor:

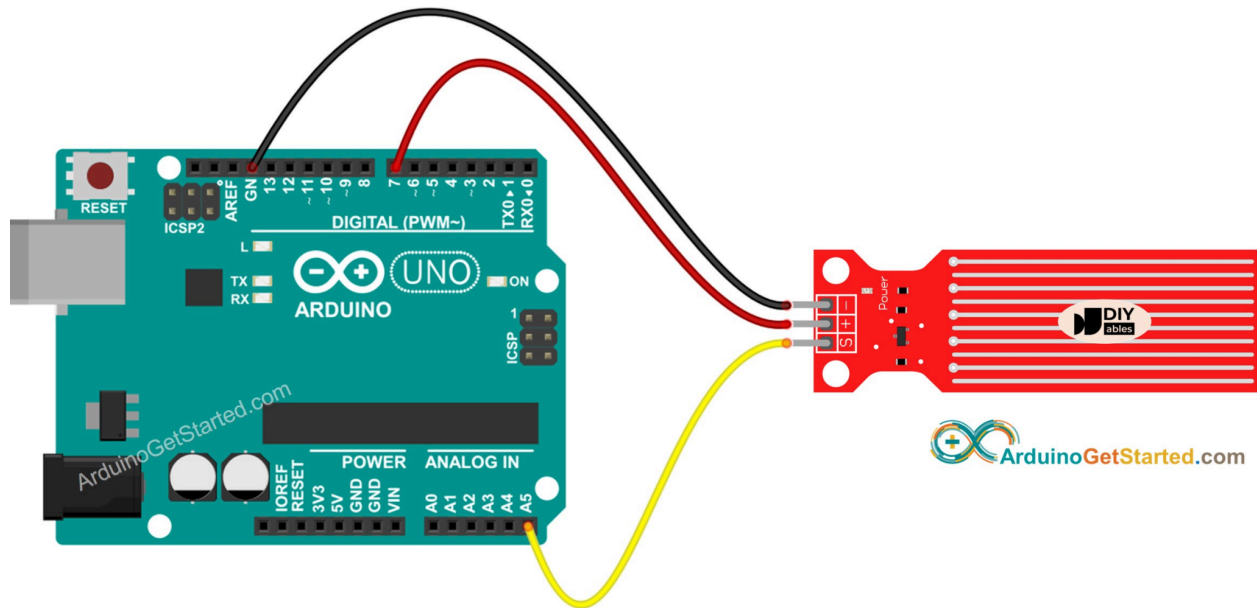
We used this sensor to detect water leakage, rainfall, tank overflow, or to measure the water level.

Description:

There are 3 pins in the water sensor Signal(S), Vcc(+) and Gnd(-)

We connect the signal pin with an analog port in the Arduino, Vcc to the 3v port and (-) with the GND port.

Then we just compile and upload the code from the IDE to the arduino board and check the value.



CODE:

```
J: > Arduino > watersensor > G+ watersensor.ino
1 void setup(){
2   Serial.begin(9600);    // Communication started with 9600 baud
3 }
4 void loop(){
5   int sensor=analogRead(A0); // Incoming analog signal read and appointed sensor
6   Serial.println(sensor);   //Wrote serial port
7 }
```

Doing the baud setup and after that reading the analog data from the water sensor and printing the data.

Link: <https://github.com/RonjonKar3/CSE406-IOT.git>