East West University

Internet of Things (CSE-406)

Lab report 1

Submitted by –

Akash Saha

ID# 2022-2-60-081

Experiment Name: **Introduction to Arduino IDE, DHT11 Sensor, and Water Level Sensor.**

Objective:

- To install and set up the Arduino Integrated Development Environment (IDE).
- To understand the basic working principles of the DHT11 temperature and humidity sensor.
- To explore the functionality of a basic water sensor.

Apparatus and Components Required:

- Computer with internet access
- Arduino UNO board
- USB cable
- DHT11 Sensor
- Water Level Sensor (analog)
- Jumper wires

Theory:

1.**Arduino IDE:**

The Arduino IDE, an open-source environment for creating and uploading programs to boards that are compatible with Arduino. It enables serial connectivity for testing and debugging and supports C/C++.

2. **DHT11 Sensor:**

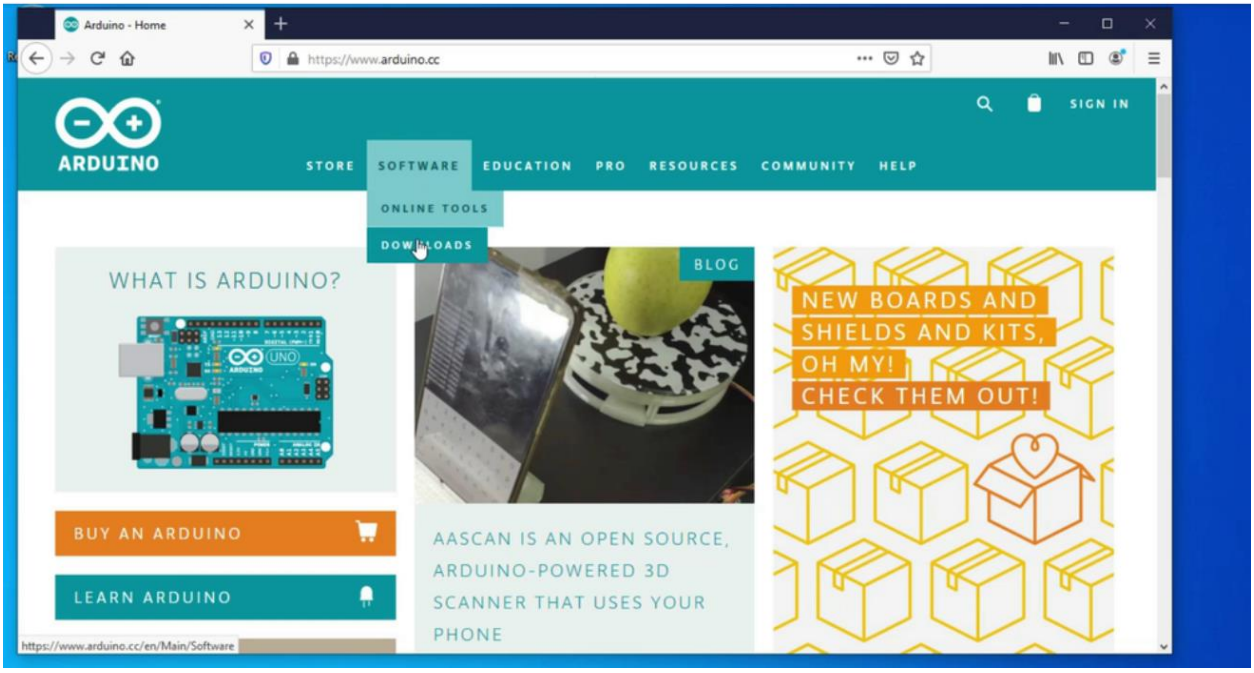
The DHT11 is a simple digital sensor for humidity and temperature. It measures the ambient air using a thermistor and a capacitive humidity sensor before sending a digital signal to a single data pin. Indoor monitoring systems, smart agriculture, and weather stations all make extensive use of it.

3. **Water Level Sensor:**
A water sensor measures the water level or its presence. Based on the amount of water sensed, it generates an analogue signal using the conductivity principle. It is frequently utilized in automated irrigation systems, flood detection, and tanks.

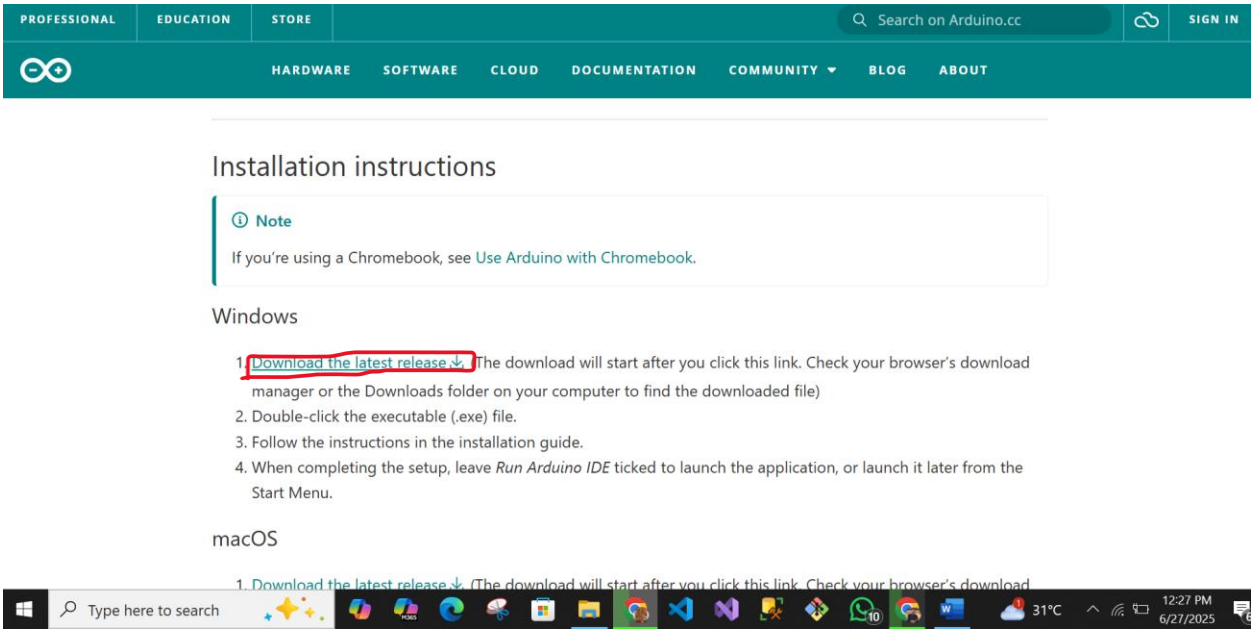
Lab Activities:

- Arduino IDE installation

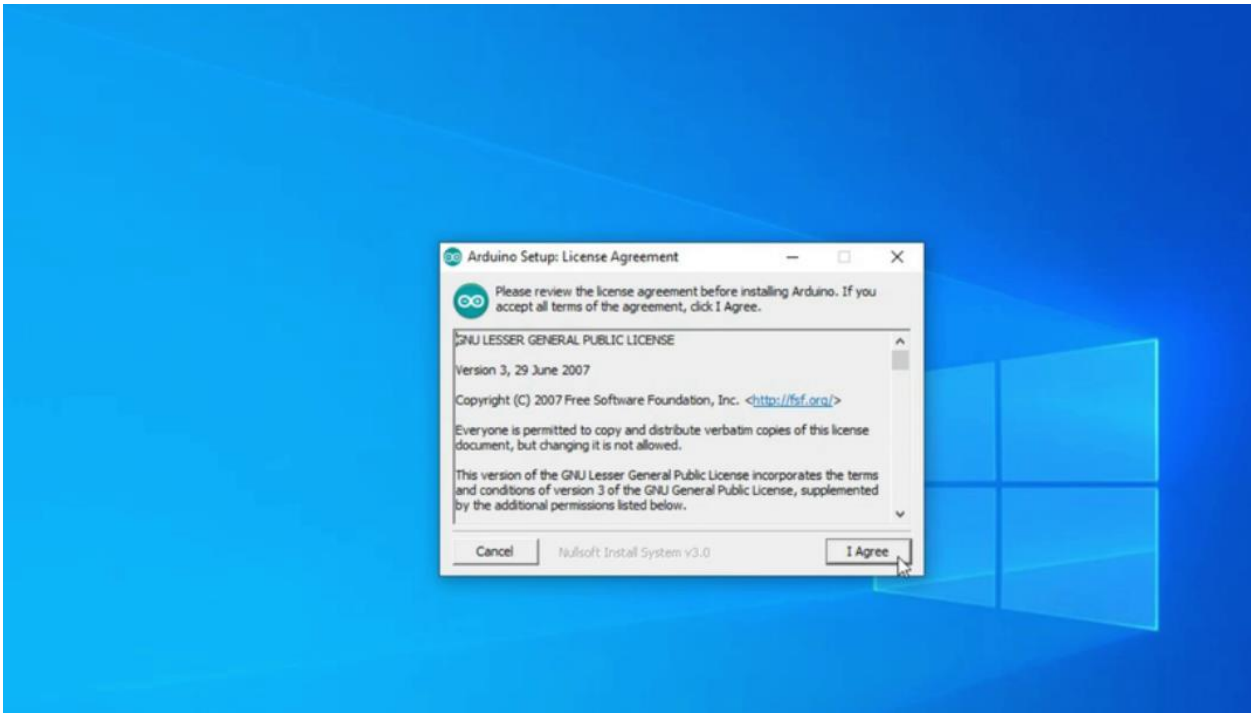
  Step 1: Go to the Arduino.cc Website



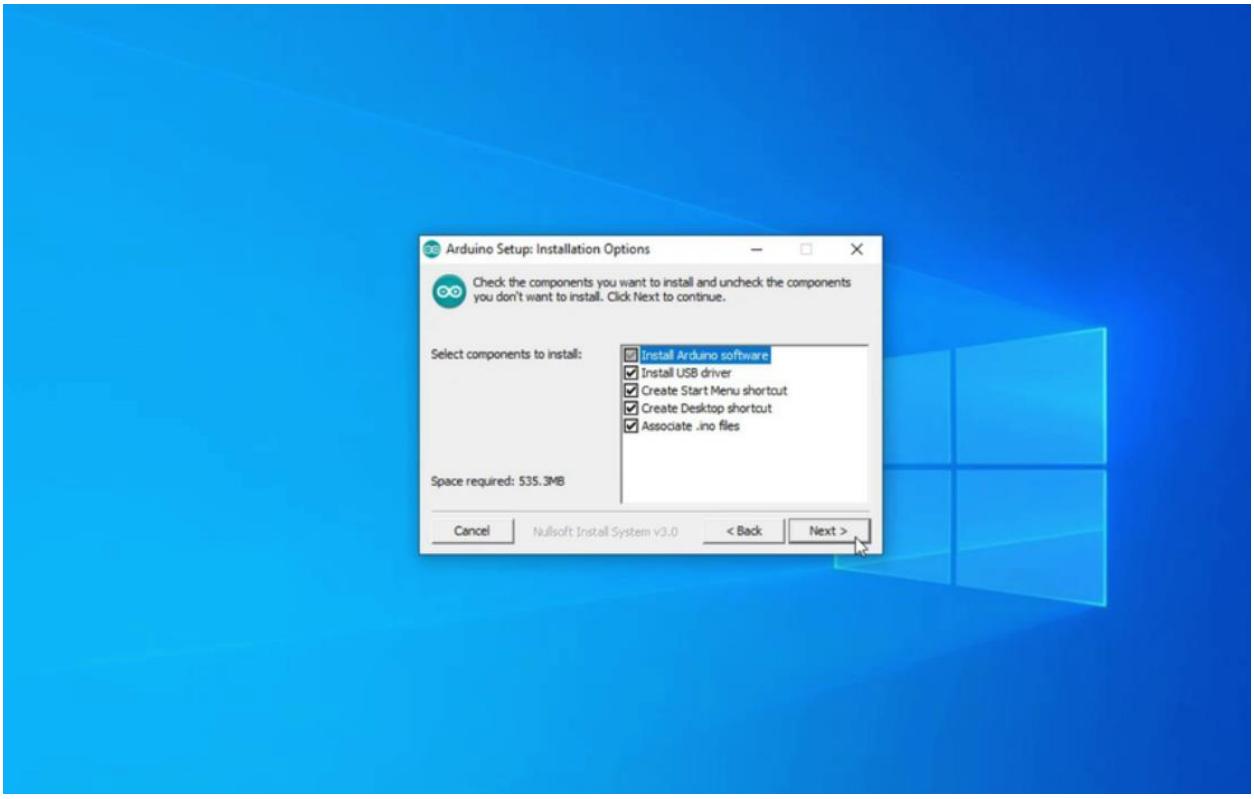
Step 2: Click on the Download Link



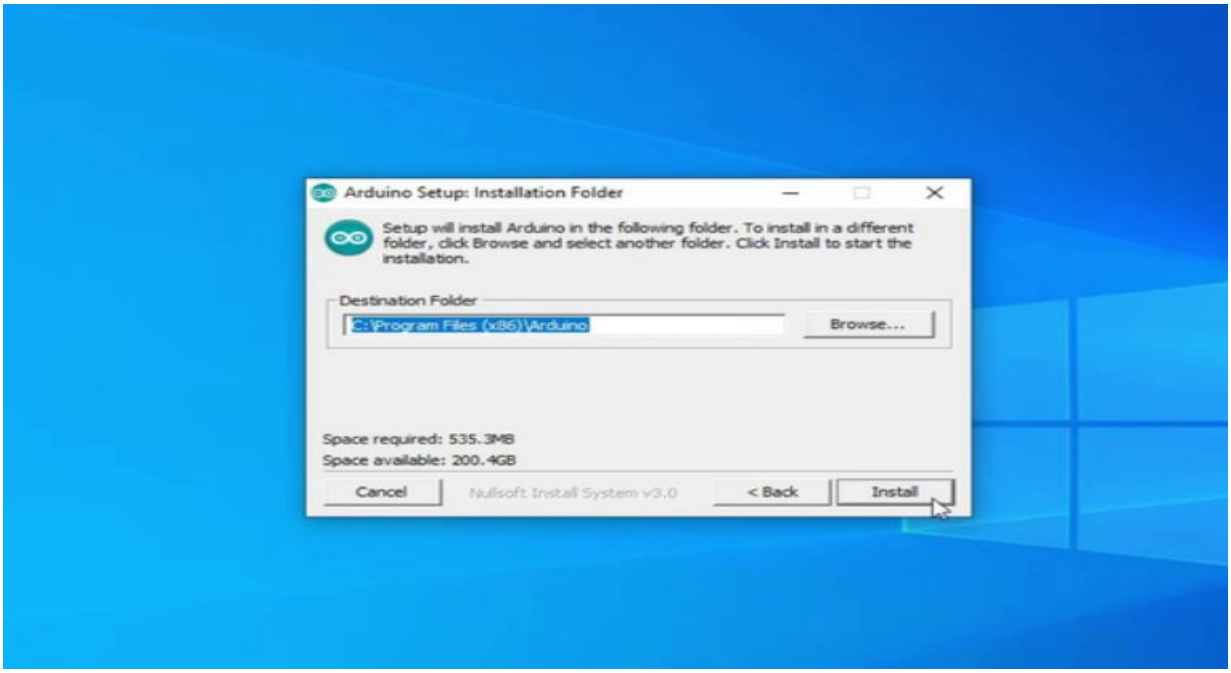
Step 3: Begin the Installation Process



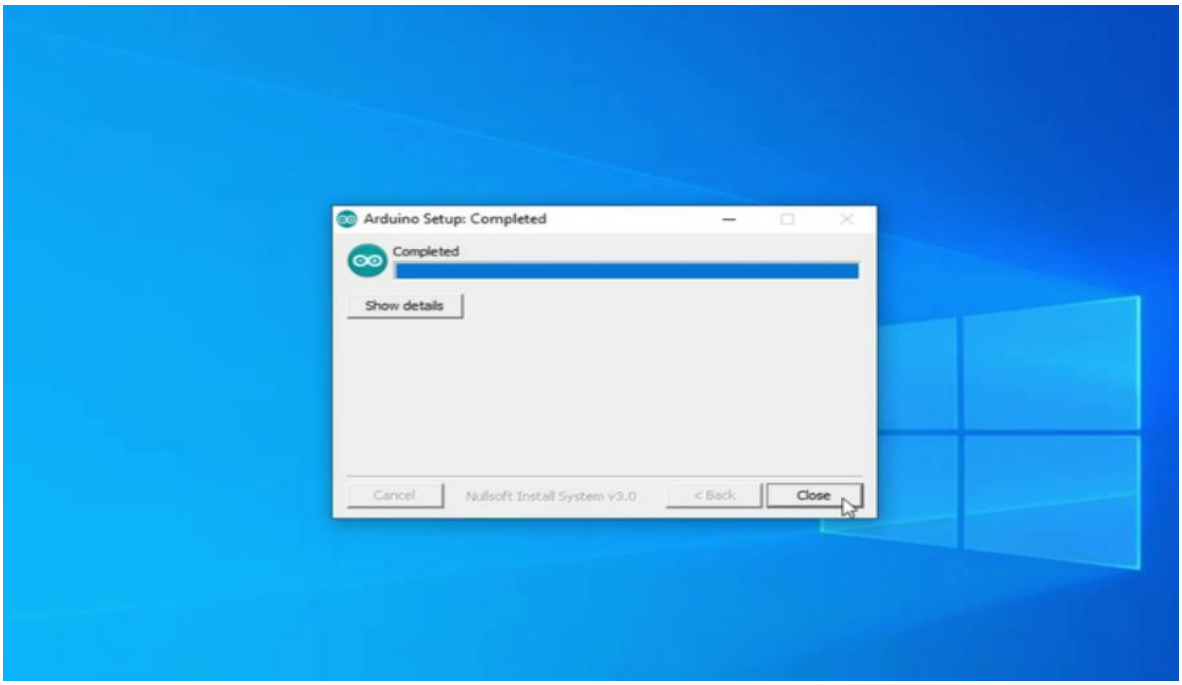
Step 4: Select What to Install



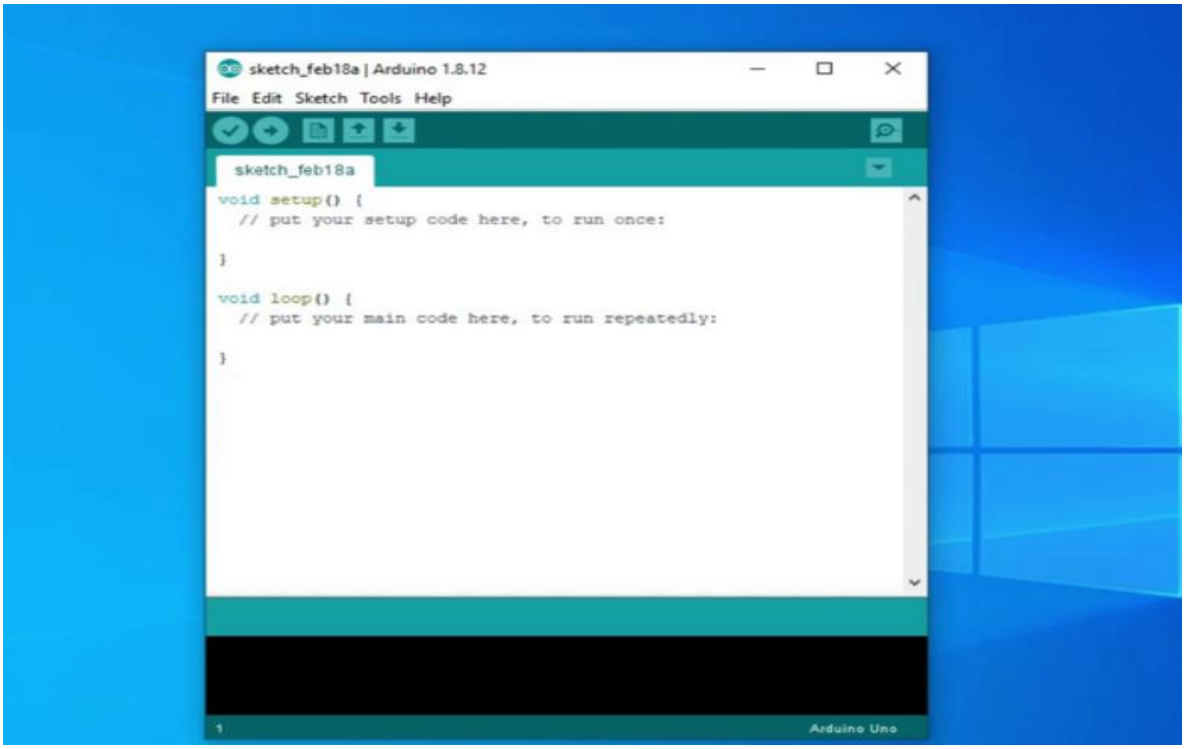
Step 5: Choose the Installation Path



Step 6: Finish the Installation

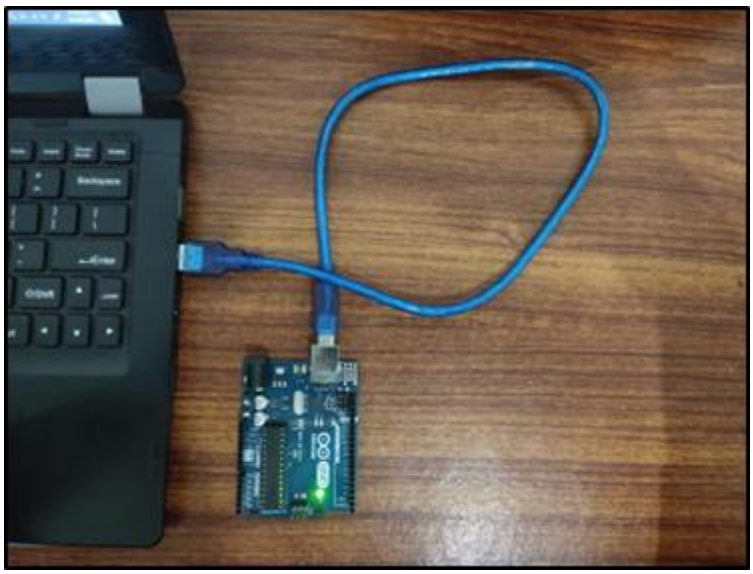


Step 7: Launch the Arduino IDE



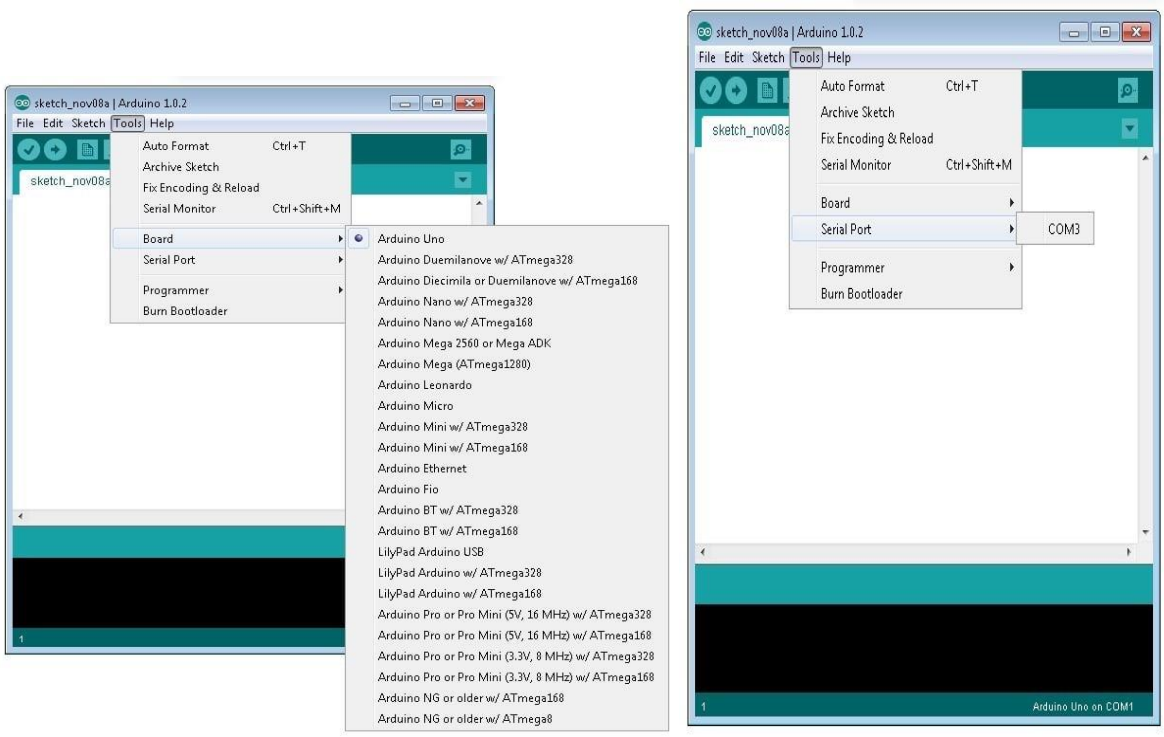
Connect Arduino UNO Board

1. Connect your **Arduino UNO** board to your computer using a **USB Type-A to Type-B cable**.
2. The power LED (green) on the board should light up.



Select Arduino Board and Port

1. Open the Arduino IDE.
2. Go to **Tools > Board > Arduino AVR Boards > Arduino Uno**
3. Go to **Tools > Port**
    - It will show a port like COM3 or COM4 (it depends on the PC).
    - Select the **COM port** that appears after plug in the Arduino.



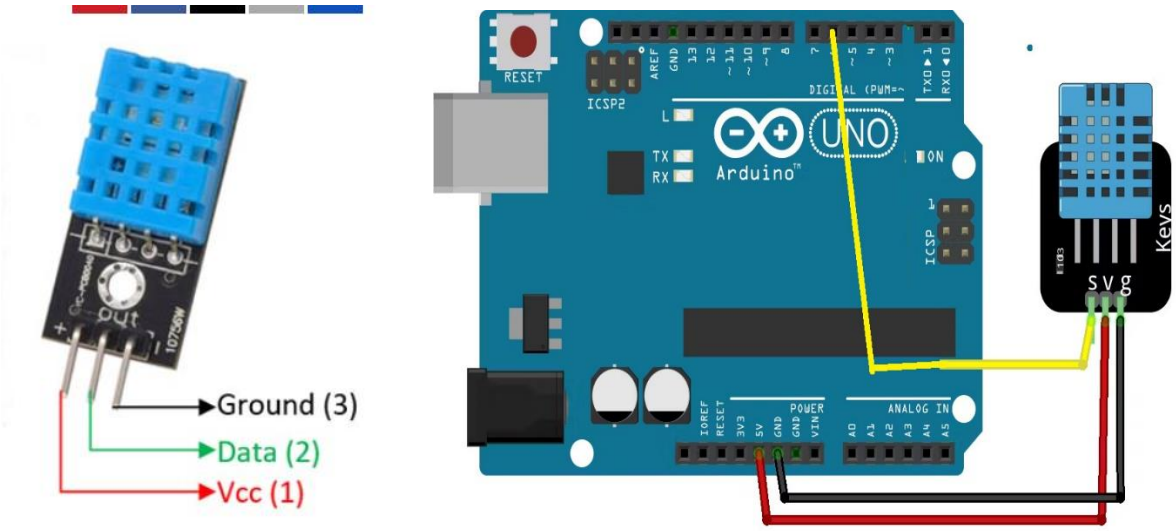
Upload the Blink Program

1. Go to **File > Examples > 01.Basics > Blink**
   This code will blink the **built-in LED on pin 13**.
2. Click the **Upload (→) button** at the top left.
3. After compiling, the IDE will upload the code and show **"Done uploading"**.

Then the onboard LED will start **blinking every 1 second**.

DHT11 Sensor Demonstration:

❖ DHT11 Pin Configuration:



❖ Installing the DHT Library:

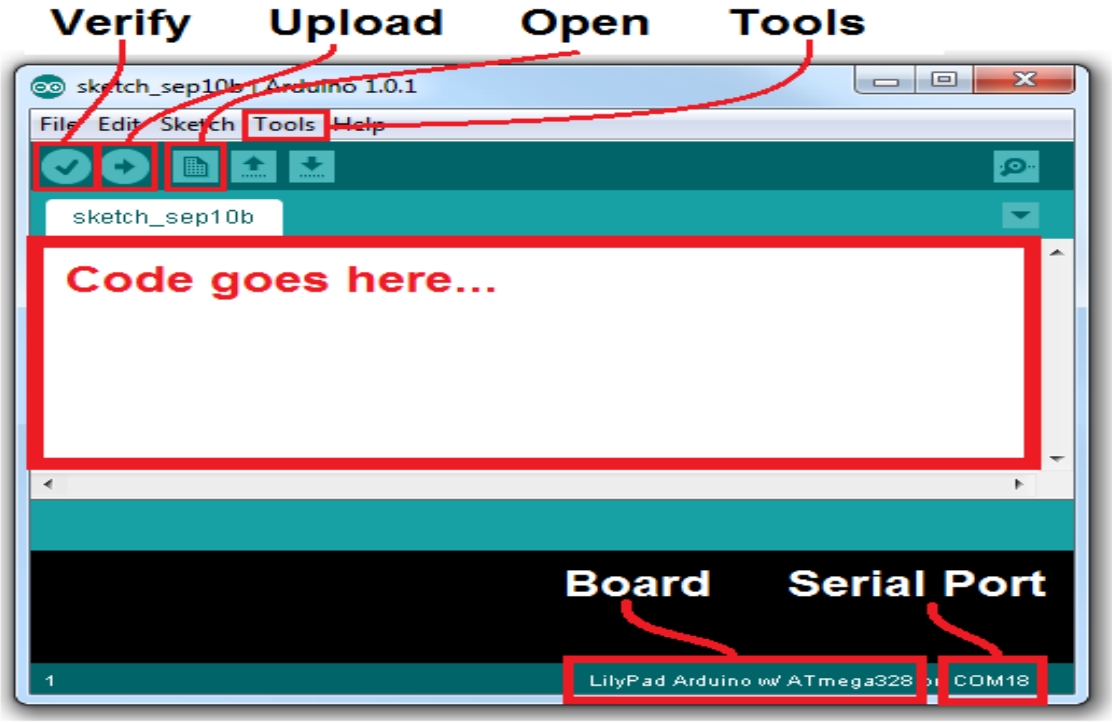
1. Open **Arduino IDE**.
2. Go to **Sketch > Include Library > Manage Libraries...**
3. In the Library Manager, search for **"DHT sensor library"**.
4. Install the one by **Adafruit** (it's very popular and well-maintained).
5. It will auto-install required dependencies (like Adafruit Unified Sensor Library).

Then paste the the sample code of DHT11 sensor and upload the code.

❖ Upload the Code:

1. Go to **Tools > Board > Arduino Uno**
2. Go to **Tools > Port** and select the correct **COM port**

3. Paste the code.
4. Click the **verify** (✓) button
5. Click the **Upload (→)** button

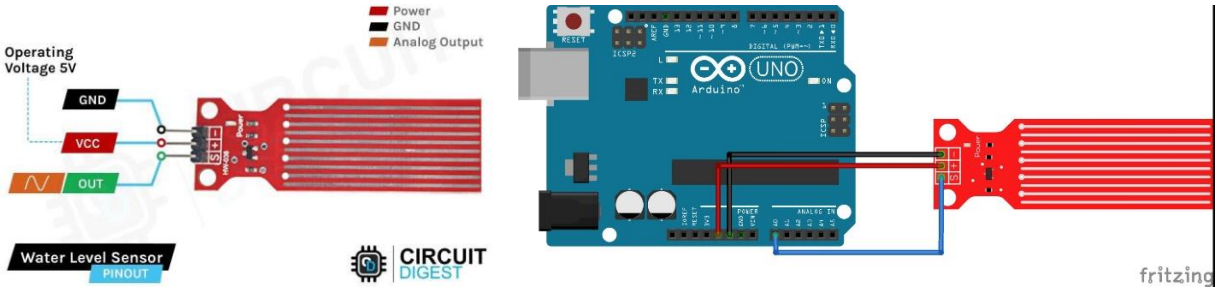


The output will be like,

```
Humidity: 55.00 %   Temperature: 27.00 *C
Humidity: 56.00 %   Temperature: 27.10 *C
```

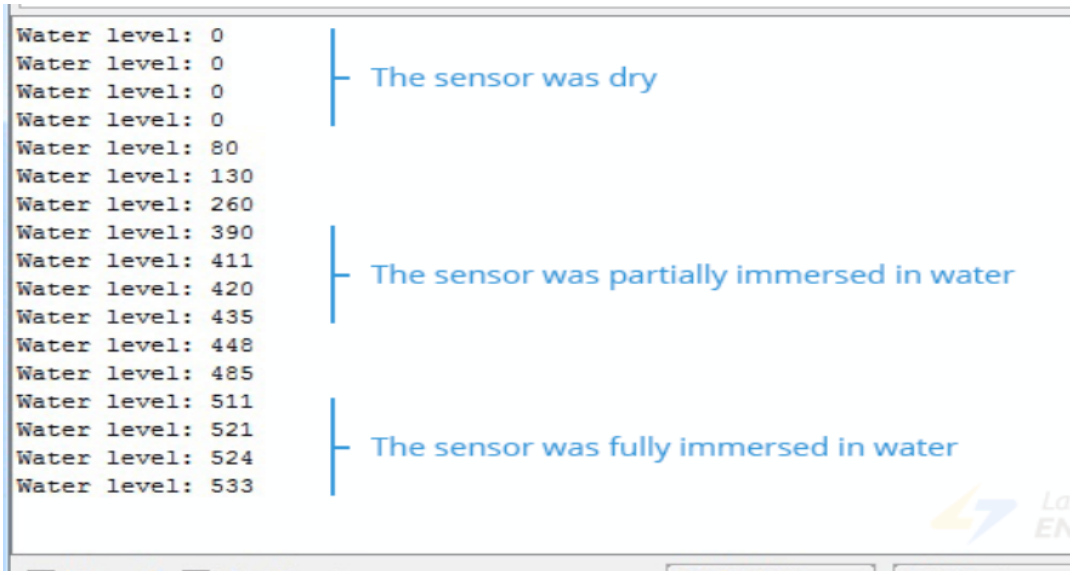
Water Sensor with Arduino

- **Pin Configuration Of water sensor**



- Then similarly upload the sample code for water sensor.

View Output in Serial Monitor

1. Open Arduino IDE
2. Go to **Tools > Serial Monitor**
3. Set baud rate to **9600**
4. Place the sensor in different water levels

   It will show the output like,