

WT Exp 6

Aim :-

Interface the Arduino, connect the components together and run the project.

Code :-

All_components_5th_iteration.ino :

```
#include <Servo.h>

// Pin definitions
const int trigPin = 7;
const int echoPin = 8;
const int servoPin = 9;
const int moisturePin = 2; // Digital pin for soil moisture sensor // Analog pin for soil moisture sensor
const int moistureThreshold = 500; // Adjust this based on calibration for wet/dry detection

Servo myServo;

void setup() {
  Serial.begin(9600);
  pinMode(trigPin, OUTPUT);
  pinMode(echoPin, INPUT);
  myServo.attach(servoPin);
  myServo.write(100);
  delay(1000);
}

void loop() {
  long duration = measureDistance();
  long distance = duration * 0.0344 / 2;

  Serial.print("Distance: ");
  Serial.print(distance);
  Serial.print(" cm");

  if (distance < 20) {
    delay(2000);
    bool isWet = digitalRead(moisturePin); // Read digital value (HIGH = Wet, LOW = Dry)
    // Digital sensor directly gives wet/dry status // Wet if above threshold, else dry

    Serial.print(", Moisture: ");
    Serial.print(isWet);
  }
}
```

```
Serial.print(" -> ");
Serial.println(isWet ? "Wet" : "Dry");

if (isWet) {
    Serial.println("Wet object detected! Moving clockwise.");
    myServo.write(180);
} else {
    Serial.println("Dry object detected! Moving counterclockwise.");
    myServo.write(20);
}
delay(1500);
Serial.println("Returning to 100 degrees.");
myServo.write(100);
delay(2000);
} else {
    Serial.println(" - No object detected. Servo remains at 100 degrees.");
}
delay(2000);
}

long measureDistance() {
    digitalWrite(trigPin, LOW);
    delayMicroseconds(2);
    digitalWrite(trigPin, HIGH);
    delayMicroseconds(10);
    digitalWrite(trigPin, LOW);
    return pulseIn(echoPin, HIGH);
}
```

Practical :-

Connecting the Arduino with all of its components :

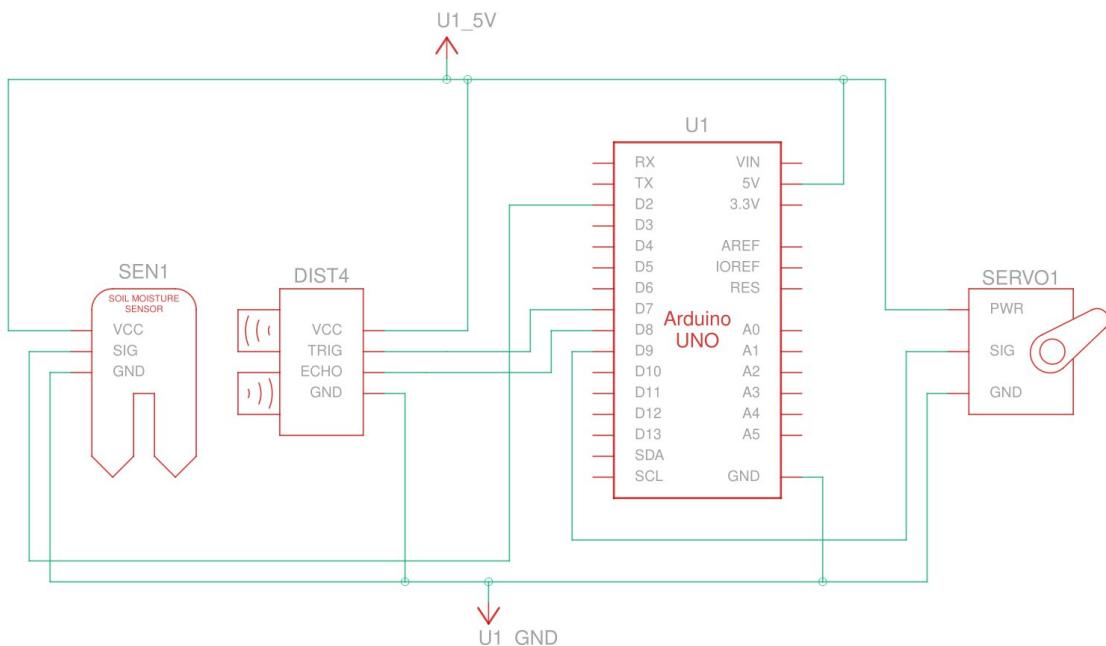
- a. HC-SR04 Ultrasonic sensor to Arduino
 - i. VCC to +5v
 - ii. TRIG to D7
 - iii. ECHO to D8
 - iv. GND to GND
- b. Soil Moisture sensor to Arduino
 - i. VCC to +5v
 - ii. D0 to D2
 - iii. GND to GND

c. Servo to Arduino

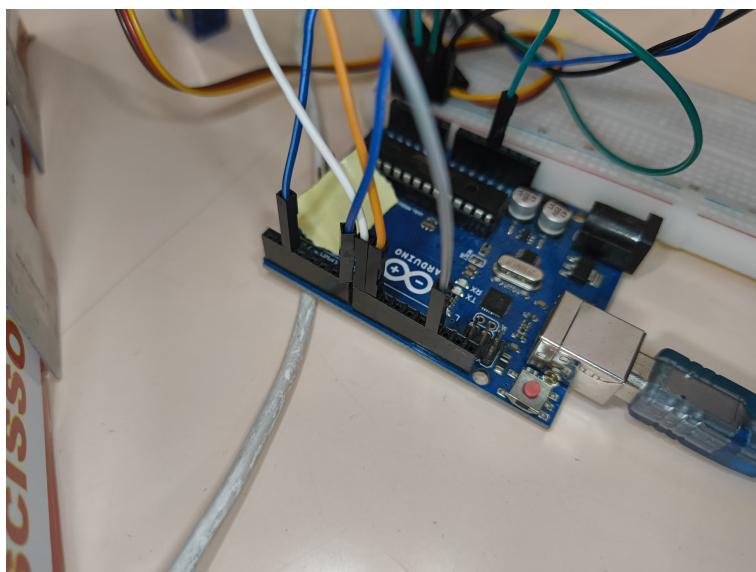
- i. Signal to D9~ (PWM)
- ii. Power to +5v
- iii. GND to GND

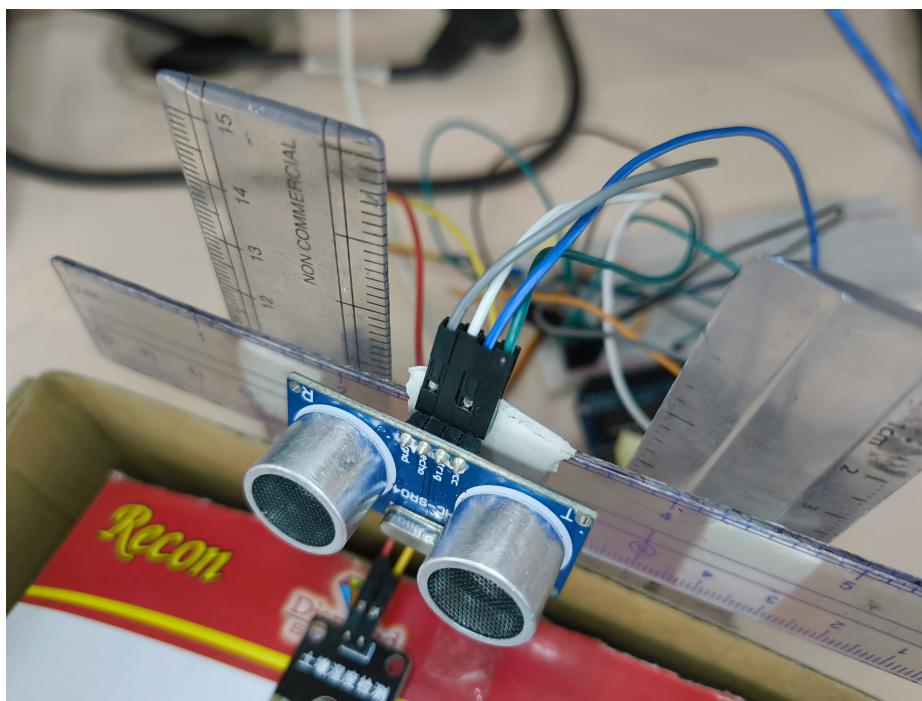
[Note : All 5v jumper wires and ground wires were connected via a Breadboard]

Logical schematic

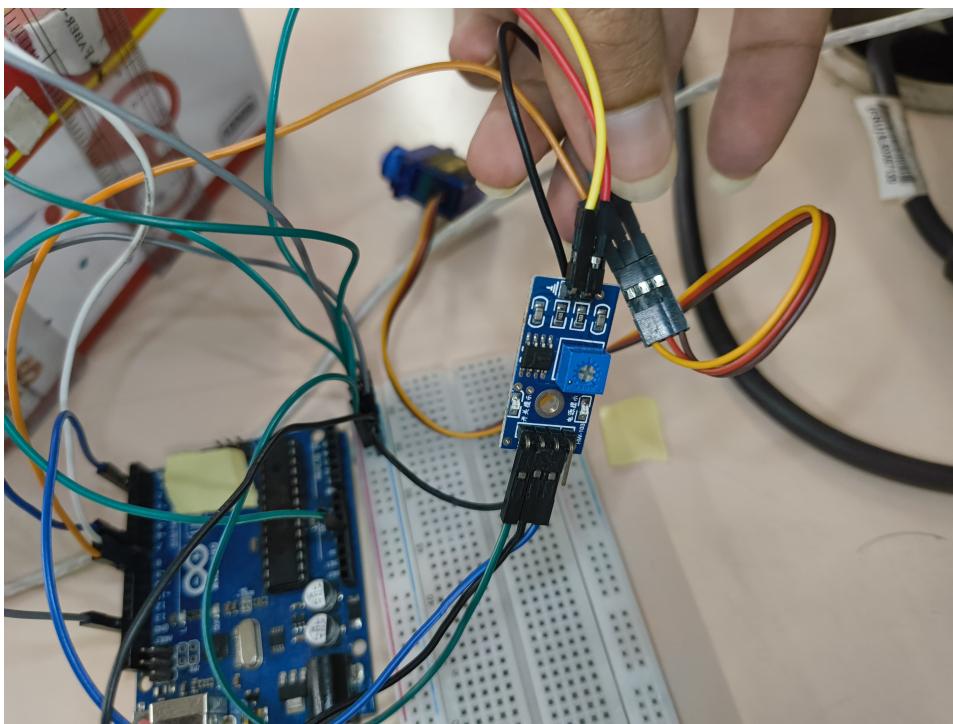
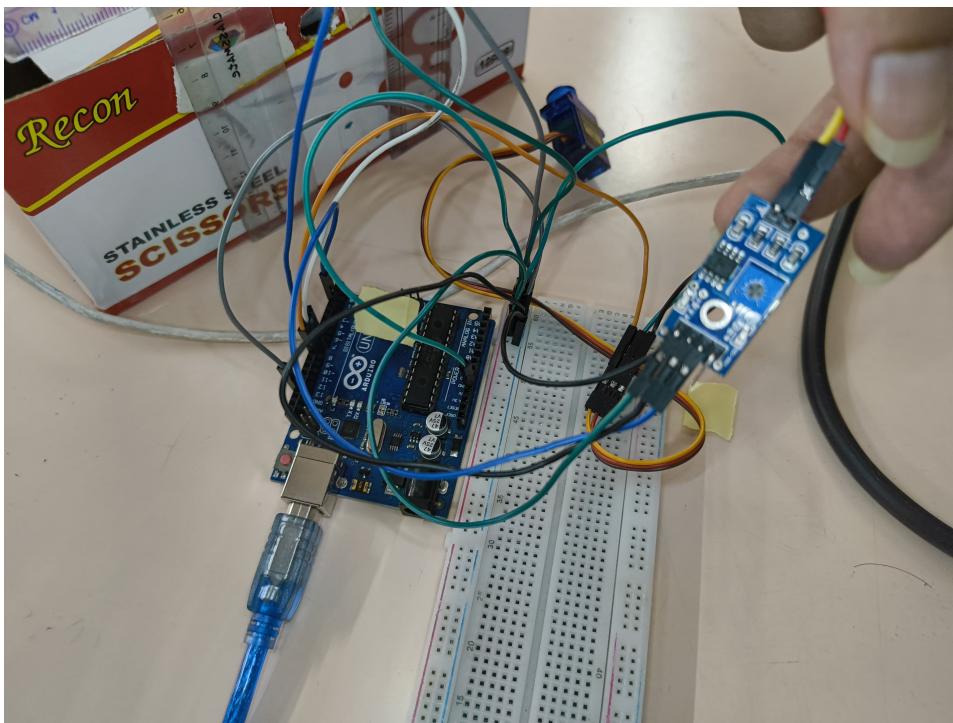


Actual connections

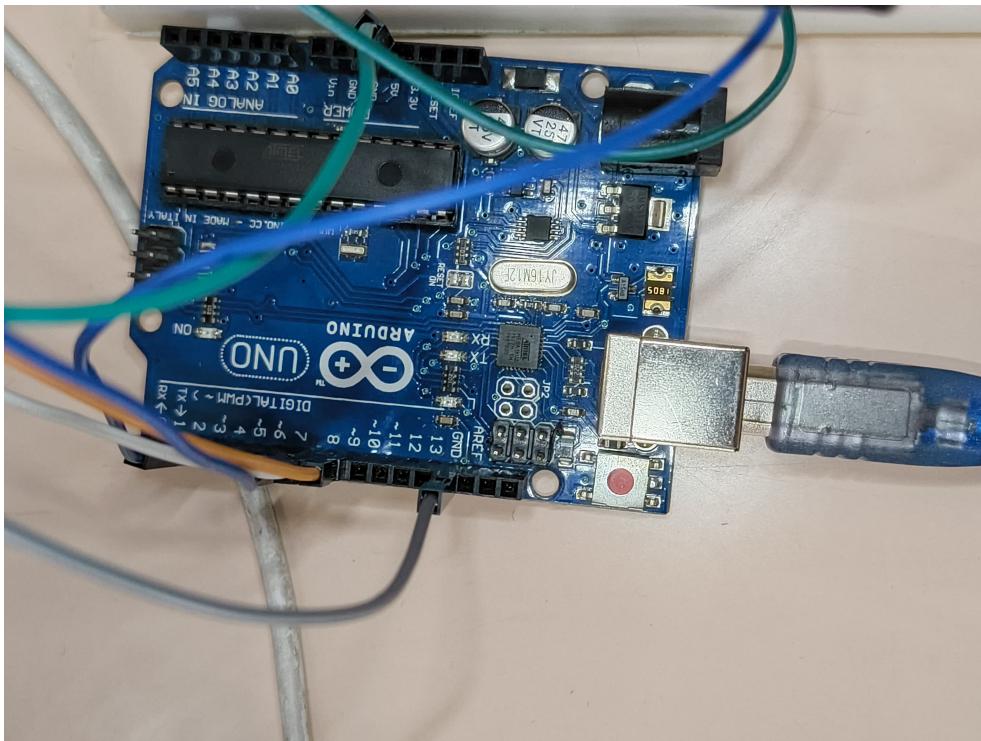
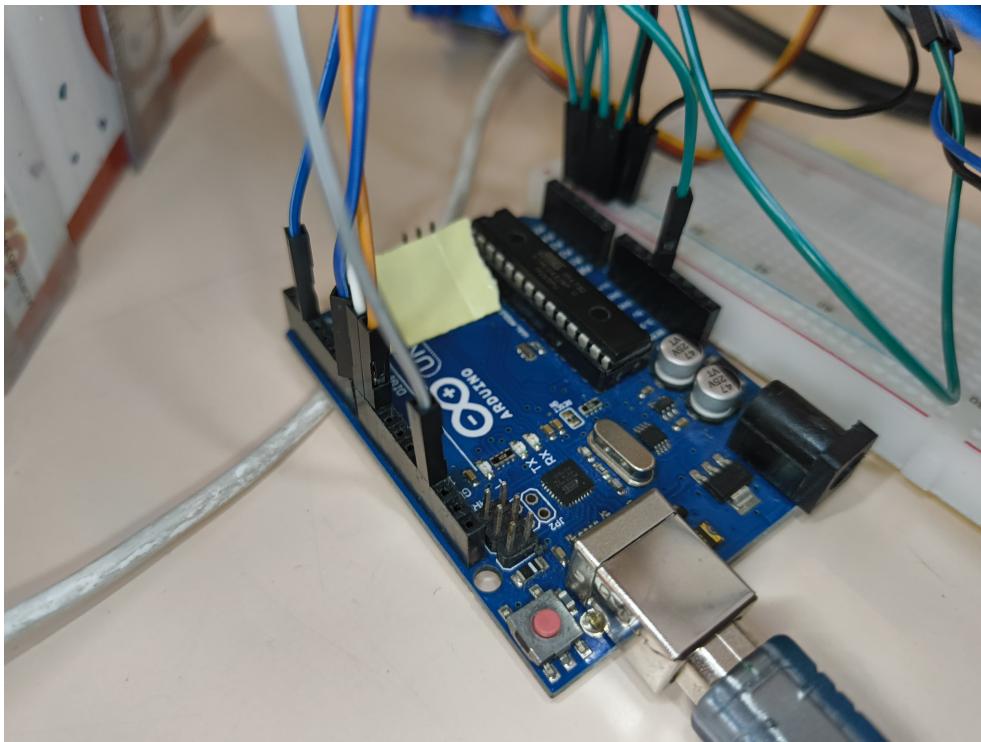


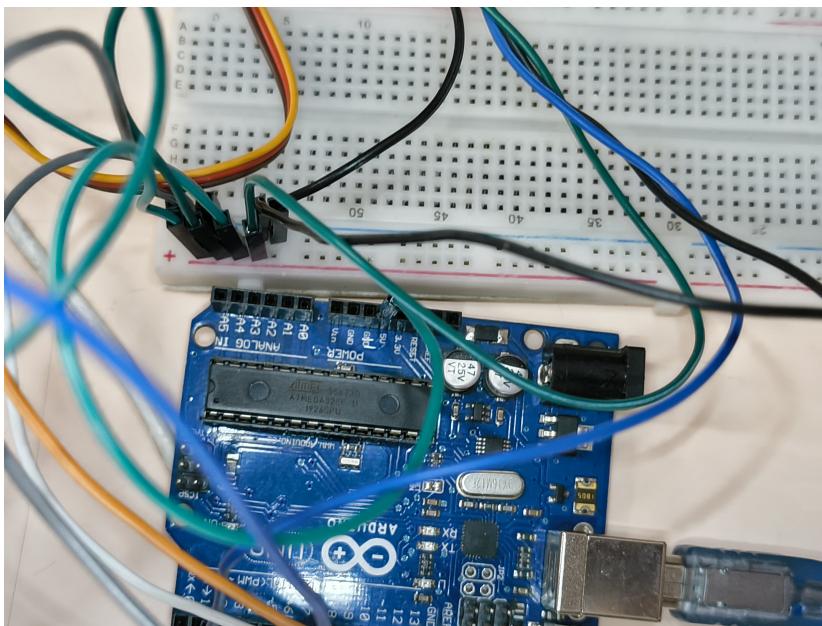


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Conclusion :-

The components were connected according to the pin numbers defined in the code, the project ran successfully with the code including functionality of all the components. The way to connect jumper cables and way to write Arduino code was understood.