EXPERIMENT 11: HUMIDITY MONITORING ROBOT

Objective: The objective of this experiment is to create a temperature monitoring robot equipped with a humidity and temperature sensor (DHT11), ultrasonic sensor for obstacle detection, and Bluetooth communication for data transmission.

Setup:

- Assemble the Chelonia Bot hardware following the instructions in Section 2.1.
- Connect the Chelonia Bot to the Arduino IDE as explained in Section 2.3.

- **DHT Sensor Connection:**
  - Connect the DHT sensor to digital pin 2 (DHTPIN).
  - Please see the connection diagram from the link : Humidity monitoring
- **Bluetooth Module Connection:**
  - Connect the RX pin of the Bluetooth module to digital pin 0.
  - Connect the TX pin of the Bluetooth module to digital pin 1.
- **Motor Connections:**
  - Connect the left motor to digital pins 8 (motorAPin1) and 9 (motorAPin2).
  - Connect the right motor to digital pins 10 (motorBPin1) and 11. (motorBPin2).
- **Ultrasonic Sensor Connections:**Ultrasonic sensor with arduino
  - Connect the Trig pin of the ultrasonic sensor to digital pin 4.
  - Connect the Echo pin of the ultrasonic sensor to digital pin 5.
- **Power Supply:**
  - Ensure that the robot is powered appropriately. Motors and sensors may require different voltage levels.
- **Libraries:**
- **DHT Library:**

To download the DHT library, click on the following link: DHT library ZIP file

After downloading the zip file, open the Arduino IDE. Navigate to the 'Sketch' menu, select 'Include Library,' and choose 'Add .ZIP Library. Locate the downloaded zip file, click 'Open,' and the Arduino IDE will install the library. Now you can use the DHT library in your Arduino sketches for the weather monitoring robot project. To ensure a smooth installation process, please refer to this link DHT library arduino

Example Code: Humidity monitoring Robo

Usage Instructions:

- **Upload the Code:**
  - Upload the provided Arduino code to the Arduino board.
- **Serial Monitor:**
  - Open the Arduino IDE Serial Monitor (Tools -> Serial Monitor).
  - Set the baud rate to 9600.

- **Bluetooth Communication:**
  - Use a Bluetooth-enabled device and connect to the Bluetooth module on the robot.
  - Monitor temperature readings on the connected device.
- **Obstacle Detection:**
  - The robot moves forward continuously unless an obstacle is detected.
  - If an obstacle is detected, the robot stops and turns left.

FAQ (Frequently Asked Questions):

Q: How do I install the DHT library?
A: Open Arduino IDE -> Sketch -> Include Library -> Manage Libraries -> Search for "DHT" -> Install.

Q: Can I use a different type of DHT sensor?
A: Yes, update the **DHTTYPE** constant in the code accordingly (DHT11 or DHT22).

Q: The robot is not moving. What could be the issue?
A: Check motor connections, power supply, and ensure that the Bluetooth module is connected.

Q: How can I adjust the obstacle detection distance?
A: Modify the distance threshold in the **check Obstacle** function (e.g., change **distance < 10** to a different value).