**AUTOMATIC PLANT WATERING SYSTEM**

**TEAM MEMBERS:**

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**ABSTRACT:**

The **automatic plant watering system** is designed using **Arduino UNO** and a **soil moisture sensor** to ensure plants receive adequate water without human intervention. The **moisture sensor** continuously monitors the soil’s moisture level. If the soil becomes **too dry**, the **Arduino activates the water pump** and displays a message on the **LCD screen** indicating the watering process. Once the soil reaches the required moisture level, the **pump turns off automatically**.

This system is useful for **gardening, farming, and home plant care**, ensuring plants stay hydrated even in the owner’s absence.

**EQUIPMENTS:**

* **Arduino UNO**
* **5V Relay Module**
* **Water Pump**
* **Tube**
* **Soil Moisture Sensor**
* **Jumper Wires**
* **LCD Display (JHD 162A)**
* **9V Battery**

**Software:**

* **Arduino IDE** – [Download Here](https://www.arduino.cc/en/software/)

**BLUETOOTH CONFIGURATION & DISPLAY INTEGRATION:**

**Bluetooth Module (HC-05)**

* The **HC-05 Bluetooth module** allows **wireless control** of the water pump using a **smartphone app**.
* It uses **serial communication** to send data between the **Arduino and mobile device**.
* The app transmits **‘48’ (ON)** and **‘49’ (OFF)** to control the pump.

**Steps to Connect:**

1. **Power on** the system and enable **Bluetooth** on your smartphone.
2. Open the **Bluetooth Serial Monitor** app.
3. Scan for devices and connect to **HC-05**.
4. Use the app to manually turn the pump **ON/OFF** as needed.

📱 **Download the App:**  
[Bluetooth Serial Monitor](https://play.google.com/store/apps/details?id=com.giumig.apps.bluetoothserialmonitor&hl=en)

**LCD Display (JHD 162A) Integration**

* The **LCD screen** displays real-time system updates.
* When the **pump is activated**, the display shows:
  + **"Watering Plants..."**
* Once the soil moisture level is sufficient, it updates to:
  + **"Moisture Level OK"**

This provides clear **visual feedback** on the system's status.

**WHAT WE’VE LEARNT FROM THIS PROJECT:**

* Understanding **sensors, microcontrollers, and IoT components**.
* Learning how to **wire and connect** hardware components.
* **Integrating hardware and software** for automation.
* **Coding** in the **Arduino IDE** to implement logic.

**FUTURE IMPROVEMENTS:**

* **Moisture Data Collection:**
  + Store **moisture requirements** of different plants and adjust the pump accordingly.
* **Solar Power Integration:**
  + Use **solar energy** for a sustainable power source.
* **Mobile App-Based Control:**
  + Develop an app to **monitor and control** the watering system remotely.

**REFERENCES**

* **Arduino Documentation** – [Read More](https://www.arduino.cc/)
* **Bluetooth Module HC-05 Guide** – [Learn More](https://www.electronicwings.com/)