**Smart Home Automation System: Rain Detection & Response**

This repository contains the code and documentation for a smart home automation system that utilizes various sensors and actuators to respond to environmental changes, particularly rainfall.

**Project Overview:**

This system aims to enhance comfort, security, and efficiency within a home environment by automating specific tasks based on real-time environmental data. Key features include:

* **Rain Detection and Response:** A rain sensor triggers:
  + **Window Control:** A servo motor opens windows for ventilation.
  + **Plant Watering:** A servo motor moves plants to a designated watering area.
  + **Sinampay Protection:** A servo motor retracts a clothesline to prevent clothes from getting wet.
* **Sound Detection:** A sound sensor monitors noise levels and triggers an LED light for security.
* **Soil Moisture Monitoring:** A soil moisture sensor provides real-time data for optimal plant watering.

**Hardware Components:**

* Arduino Uno
* 4 x Servo SG90 (for window, plant, sinampay, and potential additional actions)
* Rain Sensor
* Sound Sensor
* LED Light
* Soil Moisture Sensor

**Software Components:**

* Arduino IDE
* Custom code for sensor reading, servo control, and logic processing

**Documentation:**

* **README.md:** This file provides a project overview, hardware/software components, and instructions.
* **Schematic Diagram:** A schematic diagram of the circuit is included, outlining component connections.
* **Code Documentation:** Comments within the Arduino code explain functions, variables, and logic.

**Getting Started:**

1. **Gather Components:** Acquire all components listed in the BOM.
2. **Assemble Circuit:** Build the circuit according to the provided schematic diagram.
3. **Upload Code:** Download the Arduino code from this repository and upload it to your Arduino Uno.
4. **Test and Calibrate:** Test the system's functionality by simulating rain and sound. Calibrate the servo motors for optimal window, plant, and sinampay movement.

**Future Development:**

* **Additional Features:** Explore integrating more sensors (temperature, humidity) and actuators (smart plugs, voice Control) for expanded automation.
* **User Interface:** Develop a user interface (mobile app) for controlling the system and customizing settings.
* **Cloud Integration:** Integrate the system with cloud services for data storage, remote control, and advanced analytics.

**Contributing:**

Contributions are welcome! Feel free to submit bug fixes, feature enhancements, or new ideas.

**Contact:**

For any questions or feedback, please contact Arduiono Bois – BSCS2 Student.