EECS 1021

Minor Project Report
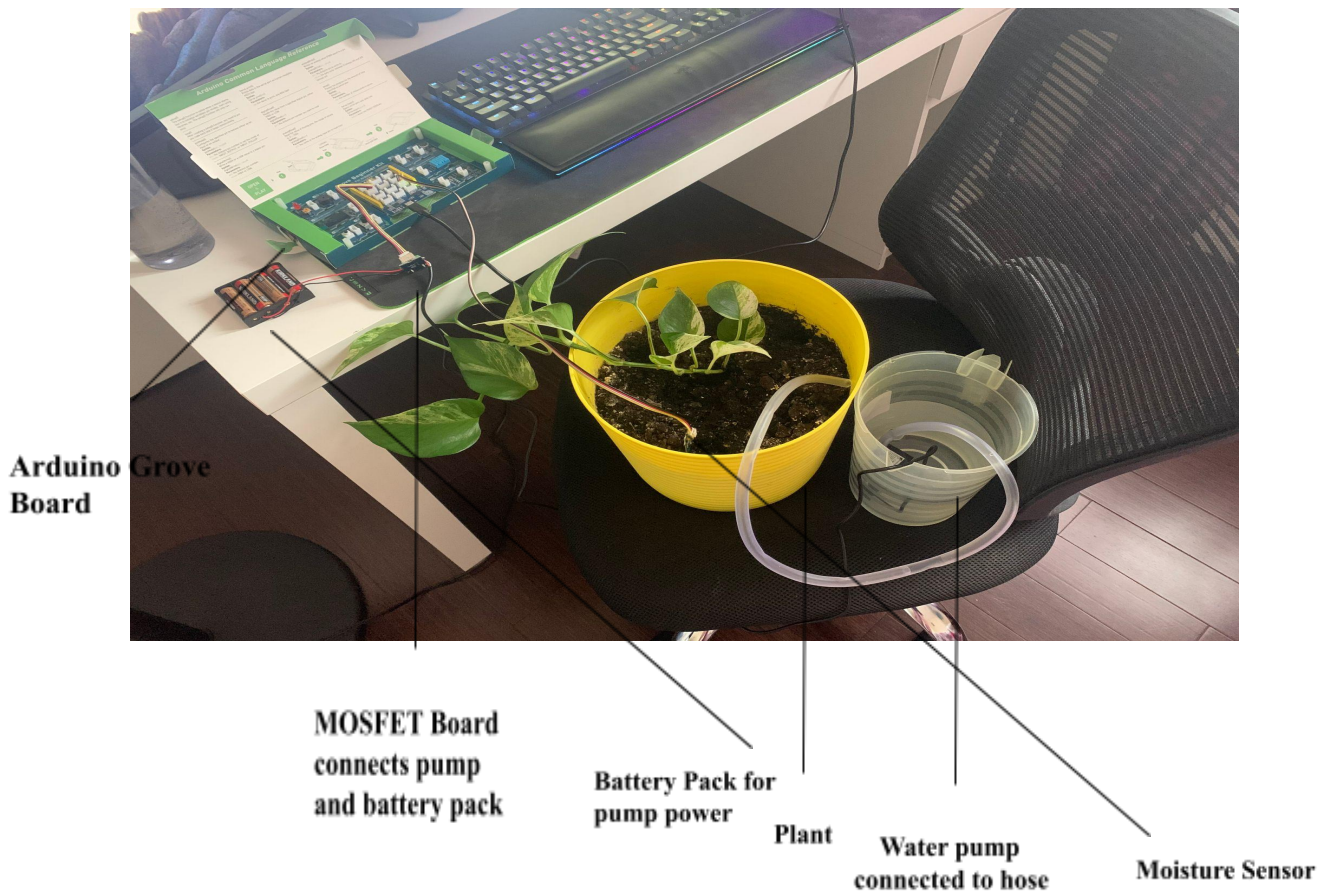
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Abstract: The Context

INTRODUCTION: This is the Minor Project of EECS 1021, which involves the usage of Java and Arduino hardware to water a plant. **OBJECTIVES:** There are three components to be connected including moisture sensor, water pump and arduino grove board, these three components will work together and communicate with each other when the plant receives enough moisture. **SOLUTION:** All components were connected and individually tested to ensure the final product is functional. **RESULTS:** After connecting the components, the plant was successfully watered and water level was stopped when there was enough moisture detected by the moisture sensor.

Labelled setup

Arduino Grove Board

MOSFET Board connects pump and battery pack

Battery Pack for pump power

Plant

Water pump connected to hose

Moisture Sensor

 Plant and hardware setup shows all the components connected together to make the Minor Project function according to the guidelines. **COMPONENTS LIST:**

Pump - Responsible for pumping the water and stopping when the moisture threshold is reached according to the java code.

MOSFET Board - Connects to the Arduino board on one end and to the pump on the other end to ensure a stable connection with the battery back module.

Battery Pack - Powers the pump with four AA batteries which allows the pump to function and pump out water as required

Moisture Sensor - Detects moisture in the soil which allows the pump to "know" when to stop pumping depending on the java code

Arduino Board - Every sub-component connects to the arduino board itself to make everything function according to the guidelines

Plant - Main test component of the entire project, plant was watered to detect moisture of soil

Flow chart:

Test: The system was tested to be functional by running the Java code and monitoring if the water is pumped out once the moisture threshold is reached and similarly for stopping the pump.

Learning outcomes: I believe the project exceeds the learning outcomes because the basics of the project function flawlessly as illustrated in the video. Also there is a graph shows for moisture values which was not required by the instructor and was taken as an extra step. In addition, the moisture values are also displayed on the Arduino OLED display which provides visual references for the user to refer to.

Conclusion: In conclusion, this project has allowed me to use all my knowledge I gained from labs which made it easier to finish the minor project and use all the methods from labs to create a plant self-watering system using Java.
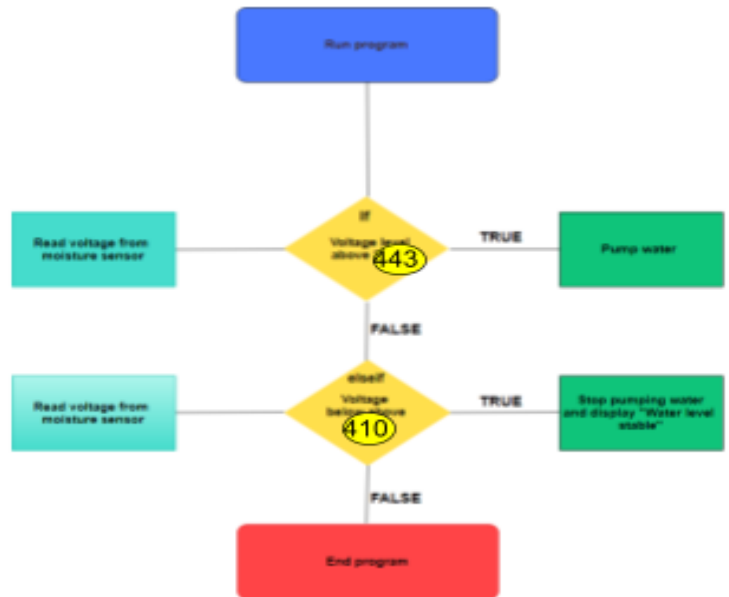
TECHNICAL REQUIREMENTS:

- Upon running the Java code on IntelliJ, the system should be able to communicate with the *arduino board* and all components connected to it
- Once connection is established, the program should check for the moisture level in the soil that is obtained from *moisture sensor* itself
- If the voltage level exceeds 443, then the *pump* should **START** pumping water
- When the voltage level is less than 410, then the *pump* should **STOP** pumping water
- Process should repeat if the same voltage threshold values are reached and only stopped once confirmed by the user

Annotated graph of soil moisture: Sensor values reading with respect to time in seconds