Automated Plant Watering System

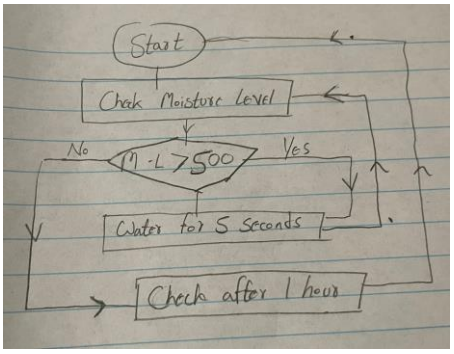
Introduction:

This technical report will show how the automated system waters the plants with the aid of the Arduino kit and IntelliJ (Java). To reduce the manual activities of humans to water plants, the idea of a plant watering system is adopted. The method employed to monitor the soil moisture level continuously and to decide whether watering is needed or not. This project can be grouped into subsystems such as power supply, relays, solenoid valve, Arduino kit, Soil moisture sensor, and water pump.

Context:

The java program and design are programmed in a way that tests the level of moisture in the soil with the moisture sensor. if the moisture level of the sensor is less than the specified value of the threshold which is predefined according to the plant's water need then the program pumps water for 5 seconds until till it reaches to the predefined threshold value.

Technical Specifications:



In its most basic form, the system is programmed in such a way that the soil moisture sensor senses the moisture level from the plant at an instance of time, if the moisture level of the sensor is less than the specified value of the threshold which is predefined according to the plant than an amount of water is supplied to plant till its moisture level reaches to the predefined threshold value. The system involves humidity and temperature sensor which keep tracking the current atmosphere of the system and has an influence on when watering happens. The solenoid valve will control the water flow in the system, when the board reads a value from the moisture sensor it triggers the solenoid valve according to the desired condition.

Components List.

- Grove Beginner Kit for Arduino
- MOSFET
- Sensor
- Water outlet
- Battery
- Pot for plant
- Pump in water supply
- USB Cable
- Java Programming Language

Procedure:

The system first makes the connection with the board and if it was successful, it displays a message on the OLED board saying, “Arduino Connection Successful.” Then it asks the user to input the number of days he/ she wants the program to run for. After that, it displays a message that the watering process has started. Then it displays time and after it measures the moisture level. If the plant was dry, the system waters the plant for 5 seconds then checks the moisture again. If the plant was still dry, it waters it for 5 seconds again, until it gets dry (the moisture level is less than the threshold amount programmed in the beginning). Once the plant is wet, the system outputs the following “Plant is wet after “seconds taken for plant to get dry” of watering and the current time and date.” Then it takes an hour to recheck again. It is programmed to check on the plant for 24 times a day.

Test:

A test was made to by running the program and the system watered the plant until it got wet. An experiment of 1 hour was done also to check if the system checks every hour as desired.

Learning Outcomes:

Nowadays, in the age of advanced technology and electronics, the lifestyle of humans should be smart, simpler, easier, and much more convenient. So, therefore; there is a need for many automated systems in human's daily life routine to reduce their daily activities and jobs. Here an idea of one such system named an automatic plant watering system is useful. As many people are facing a lot of problems watering the plants in the garden, especially when they are away from the home. This model uses sensor technologies with a microcontroller to make a smart switching device to help millions of people.

GAI 2b: Project was carefully made with all concentration on details and outputs for user to make it as simple as it could be for the user and professional from the programming side.

GAI 4b: Program specifically asks the user how many days to run the program and checks the plant 24 times a day as per requirements.

The OLED screen displays everything the system is doing to make the user aware of every action the programme is taking towards his/her plant.

GAI 4c: Program was created with all consideration to the requirements of the project and with the creativity of letting the user know every single step that is happening. Trial and error have been done a lot to make sure the program works perfectly.

Conclusion:

It has been studied in the school from the science's books that the plants are very imperative for all the humanity in many aspects. As they keep the environmental clean by producing fresh oxygen time to time. Automatic plant watering system have been seen becoming much more with the rise in the everyday objects being connected to the advanced technologies, these systems are implemented at a growing rate. Places like homes as well as on industrial levels. The main use of these systems is efficiency, easiness, and transparency for the user.