Automatic Plant Watering System

Tyler Beerman, tmbeerman42@tntech.edu

Dominic Duong, dlduong42@tntech.edu

**Abstract**: The Automatic Plant Watering System is supposed to detect the moisture level of the soil a plant is in and depending on the moisture level, the system will either water the plant or do nothing. The reason we chose this project was because Tyler has a plant in his dorm room, and we thought that it would be neat for it to be able to automate the watering process.

**System Description**: The system is made up of a relay, a pump, a Raspberry-Pi Pico Breadboard kit, some wires, and a capacitive soil sensor. The soil sensor sits in the soil, close to the base of the plant and it senses the moisture level of the soil, in the code, the threshold for dry soil was given a value of 53,000 and wet soil 30,000. If the sensor senses a value below or equal to wet soil, the code will deem the moisture level as good, and it will not water the plant and display the message, “Plant Was Just Watered”. If the sensor senses a value in between wet and dry, it will also not water the plant and will display the message, “Plant Does Not Need Watered”. If the sensor senses a value above or equal to dry soil, the system will display the message, “Plant Needs To Be Watered”, and then water the plant until the level drops below the dry soil value.A circuit board with wires and a tube

Description automatically generatedA diagram of a motor

Description automatically generated

Picture of actual wiring, and picture of the drawing.

**Citations**: We got inspiration from Collin Chidiac on Autodesk Intructables. https://www.instructables.com/Automatic-Raspberry-Pico-W-Watering-System/

A diagram on lined paper

Description automatically generated

Sequence Diagram of Project

**Cost**: The Raspberry Pi Pico Breadboard Kit goes for $22.90 on Amazon and it includes the Raspberry Pi Pico Board, the Breadboard kit, 5 of each: male-male, male-female, and female-female jumper wires. Just one capacitive soil sensor on Amazon can be bought for $6.99, but can be bought in packs ranging from 2-10 for cheaper. The pump can be purchased in a pack of 4 from Amazon with some pipe for $9.99 which would be about $2.50 for each. The relay can also be bought on Amazon for $5.49. The total of the project comes out to be $37.88.

The system did work how we expected/wanted it to work.

**Interest**

We liked this project because it wasn’t too hard for a complete beginner, but it wasn’t too easy. It was a good introduction to programming, and simple electrical wiring. It helped me learn how to program a little, and how to wire a simple circuit.