PROJECT TITLE: Automatic Plant Watering System

GROUP MEMBERS: - KRISH SHAH

                        - ZAID SHEIKH

FIRST SECTION: Overview of the Project

The SmartPlant project, developed by Zaid Sheikh and me, aimed to develop an Automated Plant Watering System with Weather Integration using Arduino and C programming. The main objective of the project was to provide an effective and long-lasting approach to maintaining plants, optimising water use, and guaranteeing ideal growing circumstances for plants.

Zaid Sheikh's Role:

As co-leader of the project, Zaid oversaw both hardware and software development. He was in charge of creating and implementing the SmartPlant system's user interface in the software output panel. This included developing a graphical user interface to display environmental factors and moisture levels in real-time, enabling users to monitor plant health and modify watering schedules. Zaid also took charge of developing algorithms for data processing and analysis, guaranteeing that users received accurate and quick feedback.

Zaid was essential in the physical component assembly and integration on the hardware front. He carefully soldered and wired the sensors, mosfets, and other hardware components to guarantee smooth operation and communication. Zaid's active participation in hardware construction included troubleshooting and fine-tuning, which contributed to the SmartPlant system's robustness and dependability.

Krish Shah's Role:

I oversaw the software development and coded the main features of the SmartPlant system. This involved integrating real-time meteorological data and developing algorithms for plant watering based on soil moisture levels. To provide the best possible care for plants, I developed algorithms that can evaluate the surrounding environment and forecast when to water them.

I also took the lead in developing the backend systems, which included communication protocols and data processing. I enhanced the efficiency and performance of the code, guaranteeing that the SmartPlant system would function perfectly in a variety of environmental circumstances.

Me and Zaid worked closely together on hardware integration, with me contributing my knowledge and skills in connecting software elements to actual hardware. He helped ensure that software and hardware subsystems integrated seamlessly by analysing and troubleshooting hardware problems.

Zaid and mine contributions and joint efforts were critical in bringing the SmartPlant project to a successful conclusion, establishing the framework for a sophisticated automated plant watering system with weather integration.

SECOND SECTION: Throughout the SmartPlant project, my primary focus was on software development and backend infrastructure. My main job was to code the core functionalities of the SmartPlant system. This included integrating real-time meteorological data and using algorithms to identify the best irrigation schedules depending on soil moisture levels and environmental factors. By developing algorithms capable of assessing the surrounding environment, I assured that the SmartPlant system could give the best plant care available.

In addition to algorithms, I led the effort to establish the SmartPlant project's backend technologies. This included developing communication protocols and implementing data processing methods to improve the system's efficiency and performance. By optimising the code, I assured that the SmartPlant system would work effortlessly under a variety of climatic situations, providing users with dependable and accurate plant care solutions.

Throughout the project, I worked closely with my teammate Zaid Sheikh to combine the software and hardware components of the SmartPlant system. By combining my knowledge in software development and backend technologies, I helped create a fully automated plant watering system that provides consumers with effective plant care options.

THIRD SECTION: I learned a lot from this course. This course provided me with foundational C language programming skills which I used to code my project.

The project faced various obstacles including creating an accurate weather forecast system and locating an appropriate pressure sensor. We overcame these hurdles with patience and the application of their skills. We created an algorithm adapted to the needs of the Canadian environment and successfully ordered the required components, despite the difficulty in obtaining a suitable pressure sensor online.

 The project provided great learning opportunities for us, such as developing weather prediction algorithms, integrating hardware components, and collaborating with teammates. We learned practical skills in C programming and sensor integration, as well as problem-solving abilities that helped them overcome project hurdles.

The project has the potential to continue and become a marketable product. If we can figure out how to make the project stand alone, which means it doesn't require a laptop, it has the potential to be an excellent product. There is a market for products that use an automated

system to monitor and water plants depending on weather predictions, particularly among gardening enthusiasts and the agricultural industry.

The project has been accurately successful in meeting its objectives. Despite the hurdles, we made substantial progress, such as ordering and obtaining necessary components, building a weather forecast system, and writing code for using the moisture sensor to water plants. Overall, the project demonstrated our collaboration, problem-solving abilities, and use of skills taught in their course to produce a viable prototype.

CODE RESULTS:

```
18:51:57.948 -> Moisture value: 1023
18:51:57.948 -> Humidity = 75.00%  Pressure: 994.24 hPa
18:51:59.022 -> Temperature: 15.27 C
18:51:59.022 -> Weather Update: Rain at Times, Worse Later
18:52:01.476 -> Unsettled weather, watering soil a bit
18:52:01.555 ->
18:52:01.555 ->
18:52:04.479 -> Moisture value: 1023
18:52:04.514 -> Humidity = 75.00%  Pressure: 994.21 hPa
18:52:05.543 -> Temperature: 15.23 C
18:52:05.575 -> Weather Update: Rain at Times, Worse Later
18:52:08.050 -> Unsettled weather, watering soil a bit
18:52:08.085 ->
18:52:08.085 ->
18:52:11.048 -> Moisture value: 1023
18:52:11.048 -> Humidity = 75.00%  Pressure: 994.21 hPa
18:52:12.101 -> Temperature: 15.20 C
18:52:12.134 -> Weather Update: Rain at Times, Worse Later
18:52:14.571 -> Unsettled weather, watering soil a bit
18:52:14.643 ->
18:52:14.643 ->
18:52:17.602 -> Moisture value: 725
18:52:17.602 -> Humidity = 75.00%  Pressure: 994.15 hPa
18:52:18.655 -> Temperature: 15.19 C
18:52:18.687 -> Weather Update: Rain at Times, Worse Later
18:52:21.125 -> Saturated Soil, not watering
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