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**Automated Gardener**

**Abstract**:

We propose to build an automatic indoor gardening system, consisting of a water feeder and light source. There are many of these automatic systems already on the market, but often they are difficult to program and expensive. We believe there exists an untapped market for easy-to-use indoor automatic gardening systems. The system will be controlled by a raspberry pi, and will be able to change settings for each plants individually using an LCD screen using plant presets. They will be able to download new programs for each plant, then select how many of each plant are in the system and which plant it is. The system will then make sure the plant gets the requisite amount of light and water each day automatically. We will construct this using a raspberry pi, LCD screen, water pumps and hoses, and lamps, all controlled by the raspberry pi. This is quite scalable as well, from a couple house plants while the family is away on vacation, to large indoor hydroponic setups, the system will be able to handle all of it.

**Overview**:

With the automated indoor gardening system we will be able to maintain the health of a small plant which can be kept indoors. Usually an indoor plant must be watered routinely and placed in contact with the sun for nourishment. As one can tell this might lead to complications because many people forget to water or move their plants as they are busy with every day matters. This could lead to a malnourished or dried up plant. However, the automated gardener will solve both of these issues while at the same time saving the user time and helping keep piece of mind. Our objective is to create a fully automatic system that will both water and nourish a plant using a fluorescent grow light and water pump system which will retrieve water from a water source such as a bottle of water. To accomplish this we will use a raspberry pi model 3 B+ to control both our grow light and watering system. The fluorescent grow light should be able to clip onto the lip of the pot so that the system can be placed onto pots of varying sizes. The watering system will be composed of a simple “replaceable ” water source such as a bottle of water or a cup of water will suffice as well. This will allow for portability because connection of a direct water source such as the kitchen sink will only restrain the system to a designated area around the house. The system should be able to follow a predefined schedule in order to water the plant daily and provide light for a certain amount of time each day. The grow light will provide enough “artificial sunlight” so that the plant will not have to be placed outside on a daily basis. The gardening settings will be changeable via the screen interface which will be mounted onto the light of system for quick changes to the system. The entire system will be easily removable so that plants can be interchangeable.

**Market research:**

“Are you having trouble watering your garden on busy work days? Tired of coming home to dead plants due to insufficient lighting and high electricity bills? The AutoGarden is the best solution for your problems.” The AutoGarden can keep your plants well-nourished by providing a balanced amount of lighting and water at an affordable price. Compared to many other competitors, the AutoGarden only requires a small amount of power to function, reducing high power consumption. Not to mention, most competitors include only one option of assistance for gardening; either auto-watering or auto-lighting. Our product includes both features, along with sensors to ensure your garden is fully monitored for any signs of malnourishment at a fraction of what other opposing products offer. Our products minimalist design helps reduce the need of expensive material, creating a lightweight and portable means of gardening. By eliminating high-costing materials, our product highlights its affordability that stands out compared to current commercialized automated gardens saving hundreds of dollars.

**Plan of action:**

We will be using an Agile Scrum managing approach throughout the 10 weeks of this course in order to effectively manage our time and to make sure we do not fall behind. We have set weekly goals and through our slack workspace we have assigned individual roles so that we can meet these goals on a weekly basis. The diagram below shows our plan of action for the remainder of this project. Adjustments may be made depending on group progress and/or complications along the way.

Table 1

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| --- | --- | --- | --- | --- |
| Week 1  9/21-9/30 | Week 2  9/30-10/7 | Week 3  10/7-10/14 | Week 4  10/7-10/14 | Week 5  10/14-10/21 |
| Find group | Come up with idea | Come up with idea | Gather Equipment | Go Over Design |
| Come up with idea | Project Proposal | Project Proposal | Irwin and Brandon: Raspberry Pi  Gabe: UV Light  Eddie: Pump, Tubing, and Power  Clifton: Cables, Soldering Kit, and Bolts  Juan: MOSFET | Setting up the Basic Structure of the device using the Tubing, Pump, and Light. |
| Week 6  10/28-11/4 | Week 7 11/4-11/11 | Week 8 11/11-11/18 | Week 9 11/18-11/25 | Week 10 11/25-12/2 |
| Begin setting up the Basic Structure of the device using the Tubing, Pump, and Light. | Setting up the Basic Structure of the device using the Tubing, Pump, and Light. | Finish setting up the Basic Structure of the device using the Tubing, Pump, and Light. | Do test runs | Finalize everything |
| Begin programming the code into Raspberry PI and start wiring components together | Programming the code into Raspberry PI and start wiring components together. | Finish Programming the code into Raspberry PI and start wiring components together. | Finalize any last minute details | Presentation |