Smart Plant Pot
CS321

Group - 6

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Our Motivation : *To save water and reduce human intervention in plant maintenance. Also to accomplish plant needs automatically that can result in a huge work reduction and time saving for the owner and makes sure that the plant stays alive and healthy.*

Brief Description of Our Project

- *The plant comes out of shade in the morning daily to go in the sunlight. After it receives its daily quota of sunlight it moves back to the shade.*
- *While moving towards sunlight, if there there comes an obstacle in the path, it stops until the obstacle gets removed.*
- *It sprinkles manure weekly.*
- *It has automated watering system and sends its health status to the user.*
- *It also notifies the user if the water tank is empty or if the plant does not get proper sunlight.*

Features of our Project

- **Automated Watering :** *If the soil is dry, it automatically provides water to the plant.*
- **Compact Design**
- **Automated Manure Providing System :** *It automatically sprinkles manure in the soil on weekly basis.*
- **Solar charging :** *Used solar panel to charge the battery.*
- **Automated Optimal Sunlight Usage :** *The plant pot moves towards the sunlight and waits in the sunlight until it gets enough sunlight.*

- **Obstacle Detection :** *If there is an obstacle in the path, when the plant pot goes towards the sunlight, it stops until the obstacle gets removed.*

- **Plant Health Monitoring System :** *Continuously monitoring the status of sensors and provide signal or notifications on mobile (using mqtt)for taking necessary actions.*

- **Important Notification On Mobile (MQTT)**
  - *Empty Water Reservoir*
  - *Rain*
  - *Lack of Sunlight*
  - *Bad Air Quality*

Working of The Project

- *Plant pot is placed on chasis to transport the plant to the sunlight. The pot can sense the moisture level in the soil by **soil moisture sensor** and **motor** pumps the water till the soil gets moist.*
- *When the tank is empty the value of **water sensor** goes to 1 and the user is notified on his phone through mqtt . By **servo motor**, It sprinkles manure in the morning before going in the sunlight on weekly basis .*
- *The user can monitor the plant health by subscribing **plant_health** channel in my **mqtt app**. The channel includes information about Temperature , Humidity, sunlight and Air quality.*

- *The user can also subscribe to **notification** channel to get important information as if it does not get proper sunlight for consecutive days or if the surrounding air is highly polluted.*
- *We are using **solar panel** to charge the battery by passing voltage from solar panel to **voltage regulator** which adjusts voltage depending upon the voltage required by battery to charge.*
- *If there is an obstacle in the path when the plant pot goes towards the sunlight, **ultrasonic sensor** detects the obstacle and the pot stops until the obstacle gets removed.*
- *Once the plant gets to sunlight it waits till cumulative sunlight value obtained using **Digital Light Sensor** reaches 1 lac and then moves back to the shade.*

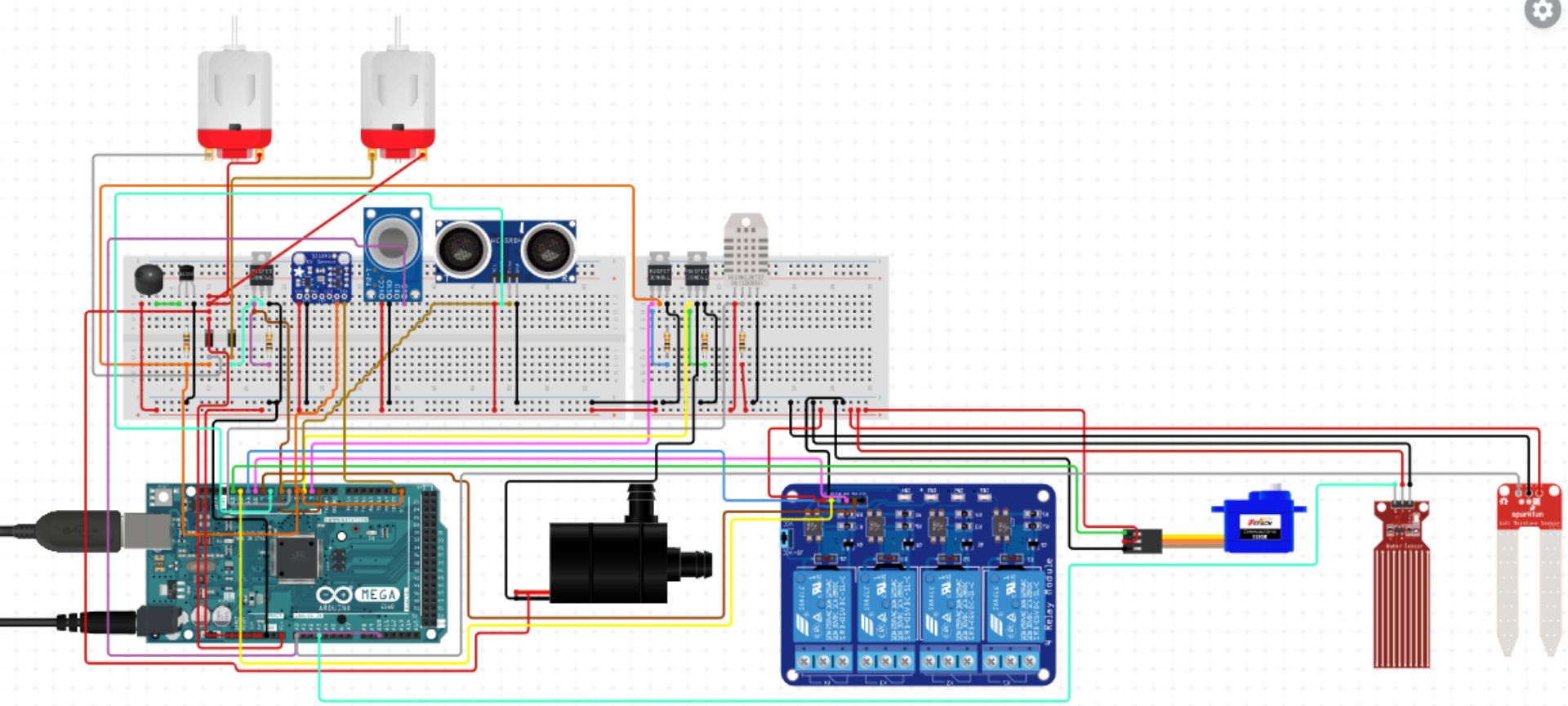

Figure : Circuit Diagram

Sensors

- *Digital Light Sensor*
- *Temperature and Humidity Sensor*
- *Ultrasonic Sensor*
- *Soil Moisture Sensor*
- *Air Quality Sensor*
- *Water Sensor*

Actuators

- *Buzzer*
- *Submersible Water Pump*
- *Motor Relay Circuit*
- *Servo Motor*
- *Solar Panel*
- *Solar Panel Voltage Regulator Circuit*
- *2 DC Motors*

Conclusions

- *It reduces the owner's time.*
- *It also make sure that plant stays alive and healthy by notifying its health status to owner.*
- *The quality of soil remains maintained by providing manure.*

Drawbacks

- *It only moves back and forth.*
- *If it does not get proper sunlight for long days then it can’t do anything , it only waits for the sunlight.*
- *If the surrounding temperature, humidity and air quality goes bad then it only notifies the user and wait for the user.*

Scope of Future work

- *User can control the movement, watering and manuring of plant through MQTT, if requires.*
- *Setting different parameter values for different types of plant depending on the needs of the plant and the user can select the plant type.*
- *Including soil nutrient sensor and giving fertilizer depending upon the values of soil nutrient sensor.*
- *Ability of plant to find sunlight automatically.*
- *Instead of stopping, pot will move around the obstacle.*