A

Project Report On

"AGRICULTURE AUTOMATION"

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A Report Submitted to Charotar University of Science and Technology for Partial Fulfillment of the Requirements for the 3rd Semester Software Group Project-I (CE244)

Submitted at

CE

DEPSTAR

At Changa, Dist: Anand – 388421

CERTIFICATE

This is to certify that the report entitled "**Agriculture Automation**" is a bonafide work carried out by **Mr. Deep Prajapati (18DCE099), Mr. Pratyush Rajpara (18DCE100), Mr. Saumya Raval (18DCE103)** under the guidance and supervision of **Mr. Gaurang Patel and Ms. Aishwariya Budhrani** for the subject CE244 **Software Group Project-I** (CE) of 3rd Semester of Bachelor of Technology in **DEPSTAR** at Faculty of Technology & Engineering CHARUSAT, Gujarat.

To the best of my knowledge and belief, this work embodies the work of candidate himself, has duly been completed and fulfills the requirement of the ordinance relating to the B.Tech. Degree of the University and is up to the standard in respect of the content, presentation, and language for being referred to the examiner.

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Acknowledgment

"Words have never expressed human sentiments. This is only an attempt to express my deep gratitude which comes from my heart.

It is great pleasure for me to express my deep feeling of gratitude to my respected guide **Mrs. Aishwariya Budhrani and Mr. Gaurang Patel** for their great encouragement and constant support which provided the desired moral and confidence to carry on my work. It is with profound gratitude that I wish to express my gratefulness to them for their valuable and expert guidance and Supervision in the completion of this project work.

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DECLARATION BY THE CANDIDATE

We hereby declare that the project report entitled "**Agriculture Automation**" submitted by me to Chandubhai S. Patel Institute of Technology, Changa in partial fulfilment of the requirement for the award of the degree of **B.Tech** in Devang Patel Institute of Advance Technology and Research from DEPSTAR/FTE, is a record of bonafide CE416 Software Project Major (project work) carried out by me under the guidance of **Mrs. Aishwariya Budhrani and Mr. Gaurang Patel.** I further declare that the work carried out and documented in this project report has not been submitted anywhere else either in part or in full and it is the original work, for the award of any other degree or diploma in this institute or any other institute or university.

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ABSTRACT

There are more humans alive on Earth right now than ever before—7.3 billion—and that number is still growing, with UN projections that it will reach 9.7 billion by 2050. A population of this magnitude brings a lot of challenges, food production chief among them. The UN Food and Agriculture Organization predicts that we need to boost worldwide food production by 70 percent over the next several decades to feed the anticipated population of 2050. Ramping up production to that degree isn't easy, but the engineers and farmers of today are working together to create a technological solution: precision agriculture and agriculture automation.

Agriculture is the oldest human industry, but it's certainly no stranger to technological change. The industrial revolutions of the 19th and 20th centuries replaced handheld tools and horse-drawn plows with gasoline engines and chemical fertilizers.

Replacing human labor with automation is a growing trend across multiple industries, and agriculture is no exception. Most aspects of farming are exceptionally labor-intensive, with much of that labor comprised of repetitive and standardized tasks—an ideal niche for robotics and automation.

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CHAPTER 1 - Introduction

PROJECT DEFINITION

This project is useful in fields to utilize water resources, reduce their wastage. Also by doing this we will also be boosting up the production of crops as all the crops get watered when required. This will make the farming process a bit easier as the farmer no longer needs to keeps checking the soil's moisture level often.

DESCRIPTION

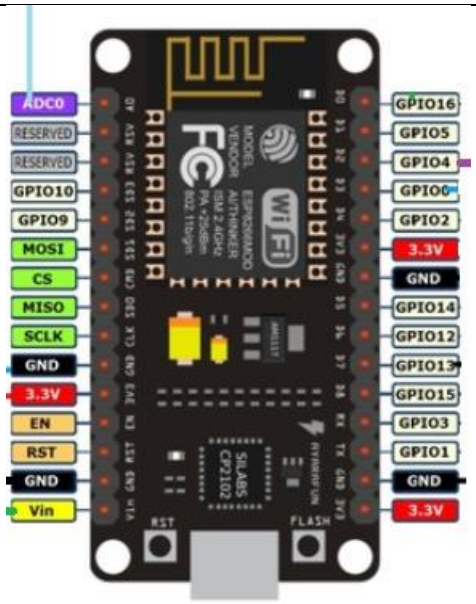
Here in our project, the heart of the matter is NodeMCU. To which all the other components are connected. The components are a relay, battery, soil moisture sensor along with a hydro humidity sensor, a dc motor. We have used Arduino Uno IDE to program the Node MCU, which performs all the tasks. We have programmed the NodeMCU such as when the soil moisture level falls below 25% the motor starts pumping the water from the tanks and thus moisture level increases.

As the moisture level reaches at 50% or above it will stop pumping the water and after each 5 seconds it will check for the moisture level, we can configure the timing when the moisture sensor refreshes, also to get accurate reading we need to properly insert the moisture sensor inside the soil.

CHAPTER 2 - System Requirements Study

SOFTWARE AND HARDWARE REQUIREMENTS

Hardwares:

Component	Description	Picture
NodeMCU	An open-source firmware and development kit that helps you to prototype your IOT product within a few Lua script lines.	
Jumper Cable	Used to close the circuit.	

Moisture Senor	The two probes allow the current to pass through the soil, which gives the resistance value to measure the moisture value.	
DC Motor	To pump the motor.	
Relay	A relay is an electrically operated switch.	

Software:

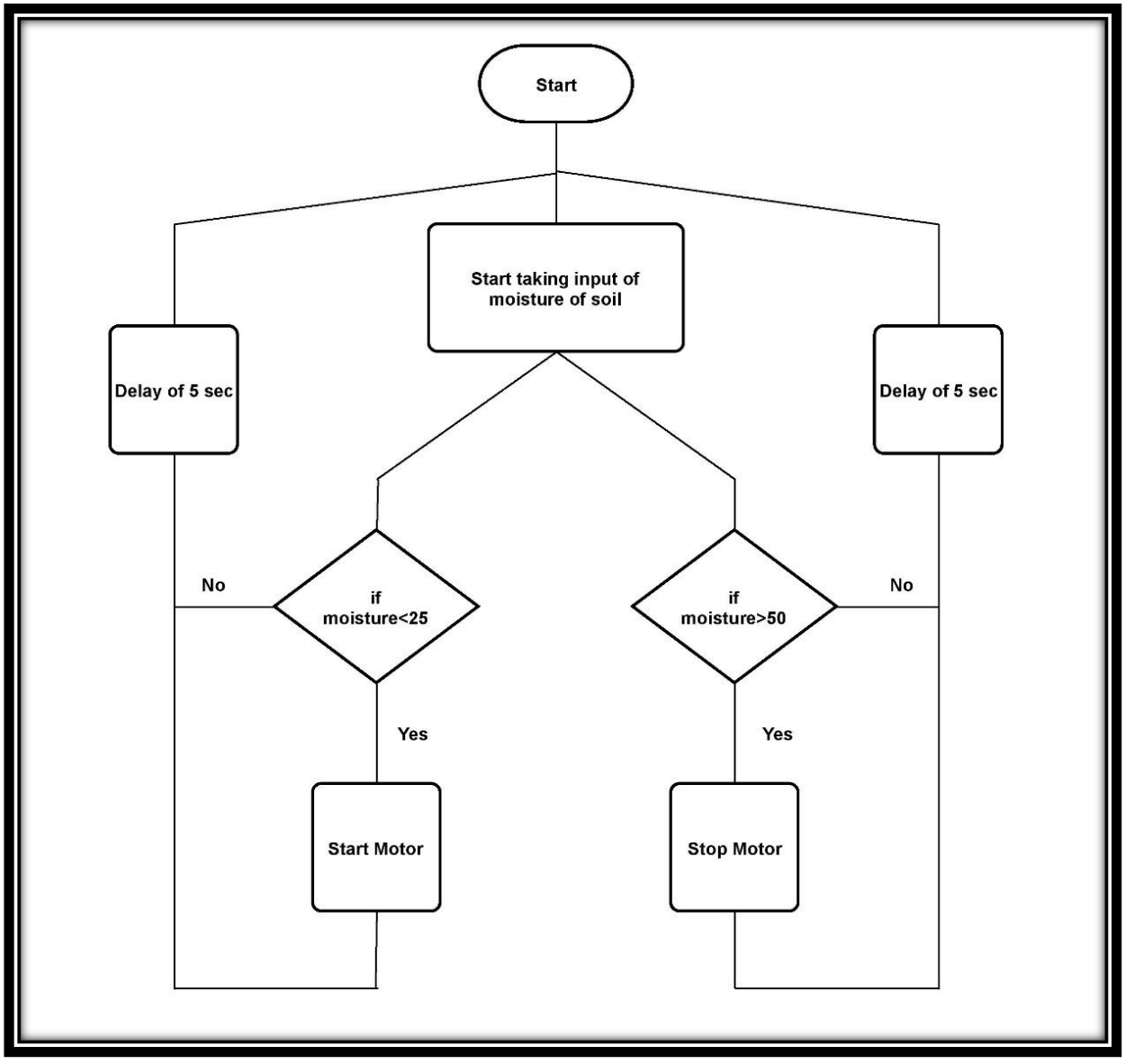
- Arduino IDE

Chapter 3 System Design

MAJOR FUNCTIONALITY

- The project will solve the major problem of maintaining uniformity in fields. Also, it will overcome the problem of a lack of manpower.
- Also, it implements Mechanization and automation in agricultural fields which will improve productivity.
- And by the automation process crop calendar is maintained.

FLOW CHART


Start
Start taking input of moisture of soil
Delay of 5 sec
Delay of 5 sec
No
if moisture<25
if moisture>50
No
Yes
Yes
Start Motor
Stop Motor

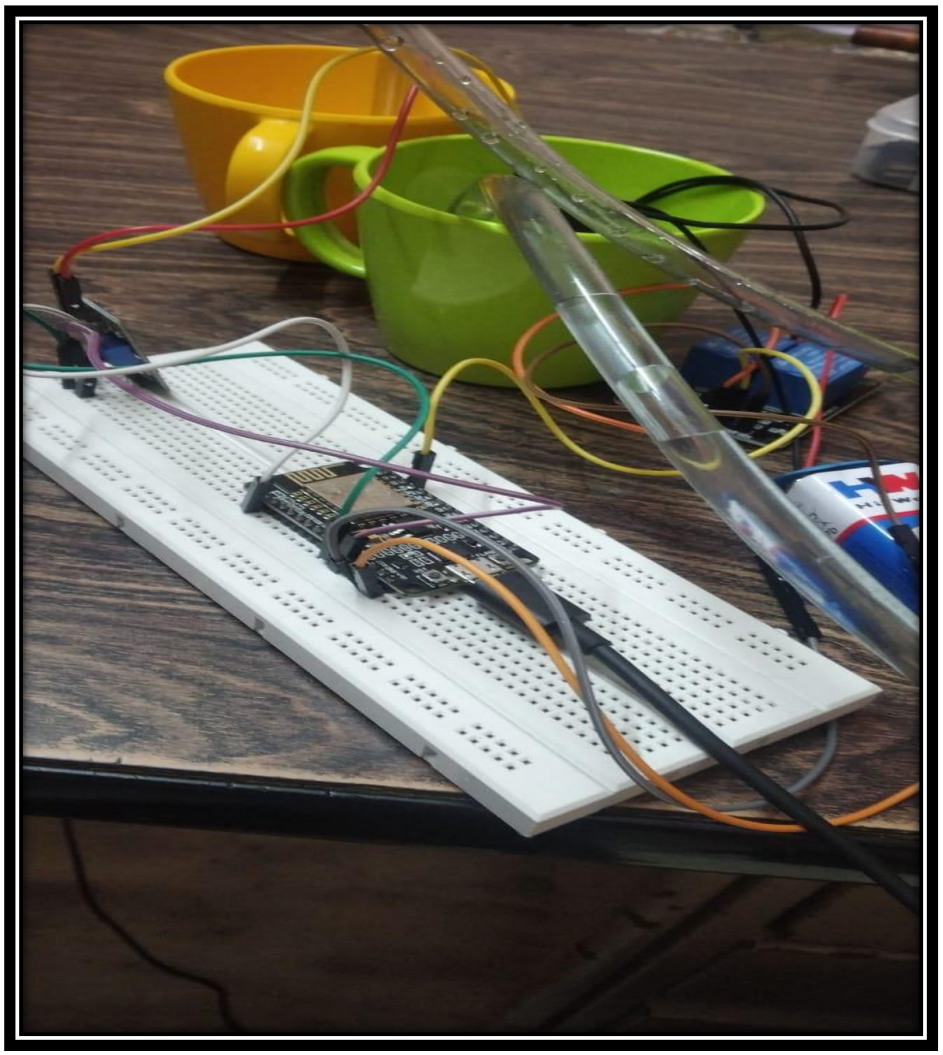
DESCRIPTION OF FLOW CHART

1. Firstly NodeMCU will start taking input from a soil moisture sensor.
2. If the moisture level is below 25% then it will start the motor and it will again check for 5 seconds for the updated moisture level.
3. And if the moisture level is greater or equal to 50% then it will stop the motor.
4. In both cases, we have kept the delay of 5 seconds.

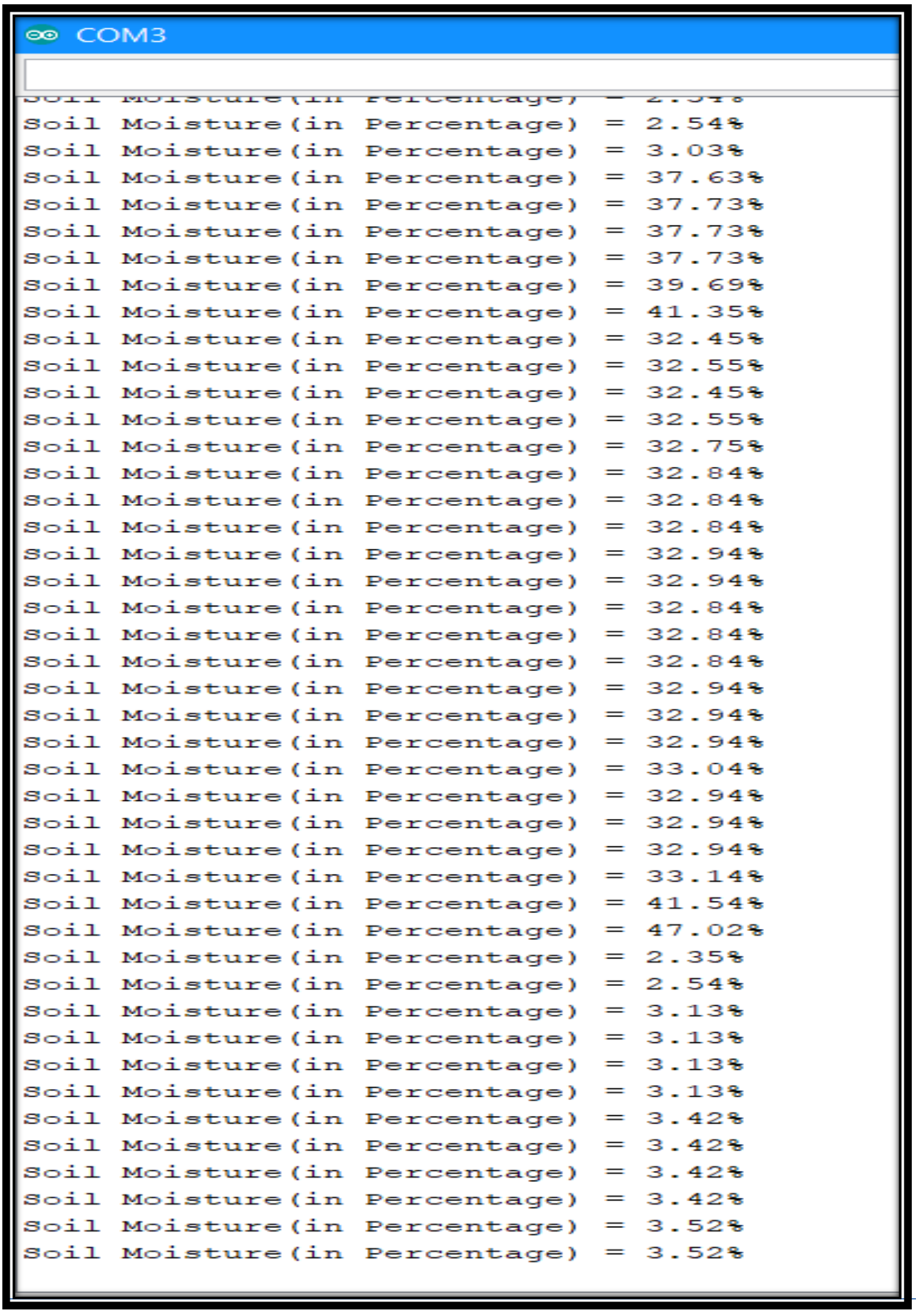
Chapter 4 Implementation planning

IMPLEMENTATION

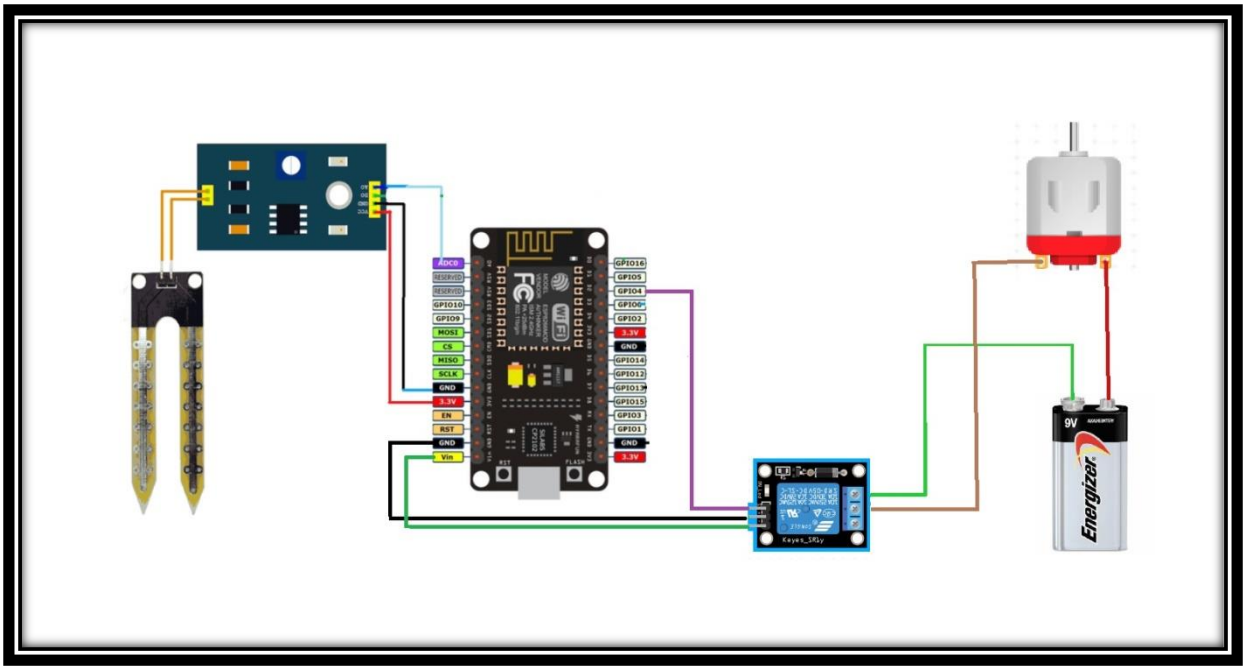
Circuit Picture



Arduino IDE Serial Monitor



CIRCUIT DIAGRAM



Chapter 5 Limitations

LIMITATIONS

- To implement this project in fields, the farmer needs to set up the whole circuit (NodeMCU & components).
- Also the all the components should be placed properly so that any kind of malfunctioning doesn't take place.
- The moisture sensor needs to be inserted properly.
- All the above-mentioned things are those for which the farmer needs to take care for himself.
- Also, the water tank from which the motor pumps the water should be filled from time to time.

Chapter 6 Future Enhancement

FUTURE EXTENSIONS

- We can connect the NodeMCU with an app called Blynk which provides the functionality to access all the data in mobile phone.
- We just need to connect the circuit with the application and, set some buttons and notifications according to our requirement.
- It will then start notifying the user about various parameters.
- We can also add a temperature sensor in the circuit to save plants from getting burnt.
- As we know not all plants require the same water quantity. so in our mobile app user have to choose which plants they are growing in their farms, and our app set the moisture parameters accordingly the predefined parameters from the developer side of that particular plants.
- for example

  for wheat, the ideal moisture level is 18% to 28%.

  for rye, the ideal moisture level is 40% to 45%.

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