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COURSE TITLE: STRUCTURED PROGRAMMING

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DESIGNING THE PROGRAM USING THE SOFTWARE DEVELOPMENT CYCLE.

- **Conceptualization:** This application is designed to ease the irrigation problem in Afe babalola university Ado ekiti. It can be downloaded on laptops and phones and as soon as it is downloaded, the app enters the profile credentials and gets redirected to the management page. It takes only 20mb memory as space. This software is capable of reading the temperature of the soil, determining the moisture content of the soil. It uses the moisture sensor available in the app to collect data about the soil and update a crop status and transmit this information from the sensors to the farm's irrigation system. The appropriate time for the water to flow is inputted into the program and optimizes the schedule and the amount of water which allows the farm to save resources and provide the best care for the farm. As soon as there is not enough water in the soil, a platform reacts to the alert and the sprinklers turn on.
- **Specification:**
 - Hardware
 - Moisture sensor (for detecting the moisture and temperature of the crops).
 - Temperature sensor.
 - SMS controllers (for scheduling on-demand irrigation)
 - Smartphone device or a laptop.

Software

- GUI (graphical user interface): push button, dialogue box, IDE, mobile user interface.
 - Timer
 - Error detection
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- Design: Algorithm and flowchart.
 - Implementation or coding: Here I used python (for control of hard ware devices).
 - Testing and debugging: The application is tested for further errors. The defects are logged into the defect tracking tool and is retested once fixed.
 - Maintenance: There will be rule and regulations for the up keep of the application and it will be a free maintenance.
 - Release and update: The application will be released in 6months and will be updated from time to time.

1) HARDWARE AND SOFTWARE FEATURES.

- Hardware features: This application is developed using sensors that helps in detecting the temperature and the moisture content of the soil. It only uses 20mb memory as space. The farm uses a sprinkler type of irrigation. The sensors are connected to the to the field and the sprinkler so that the sprinkler can receive data from the field. The sensors can provide real-time updates on even the smallest fluctuation of moisture and subtle weather changes all the data is collected by the phone or laptop the app can make certain changes.
- Software features: The application was developed using the Microsoft operating system. I also used an IDE (integrated development environment) which is a graphical user interface for source code editing,

compiling, and debugging and a code free development. A password is also set for this app to be secured and less prone to hackers.

Also, mobile user interface design is a user friendly interface used in its development so as to helps users to manipulate the system, and a device output that allows the system to indicate the effects of the user's manipulation. The timer is an essential tool to apply water in the necessary quantity and right time. The time (8am to 6pm), volume of water and the average flow of water are all monitored.

2) ALGORITHM.

An algorithm to show how the application works on the irrigation system.

STEP 1: Start.

STEP 2: Monitoring and controlling system on.

STEP 3: Time to wet soil

STEP 4: If No

Monitoring and controlling system on.

STEP 5: If Yes

Motor and solenoid valve turn on.

STEP 6: Then

Read time and moisture sensor.

STEP 7: If moisture sensor reads ≥ 600

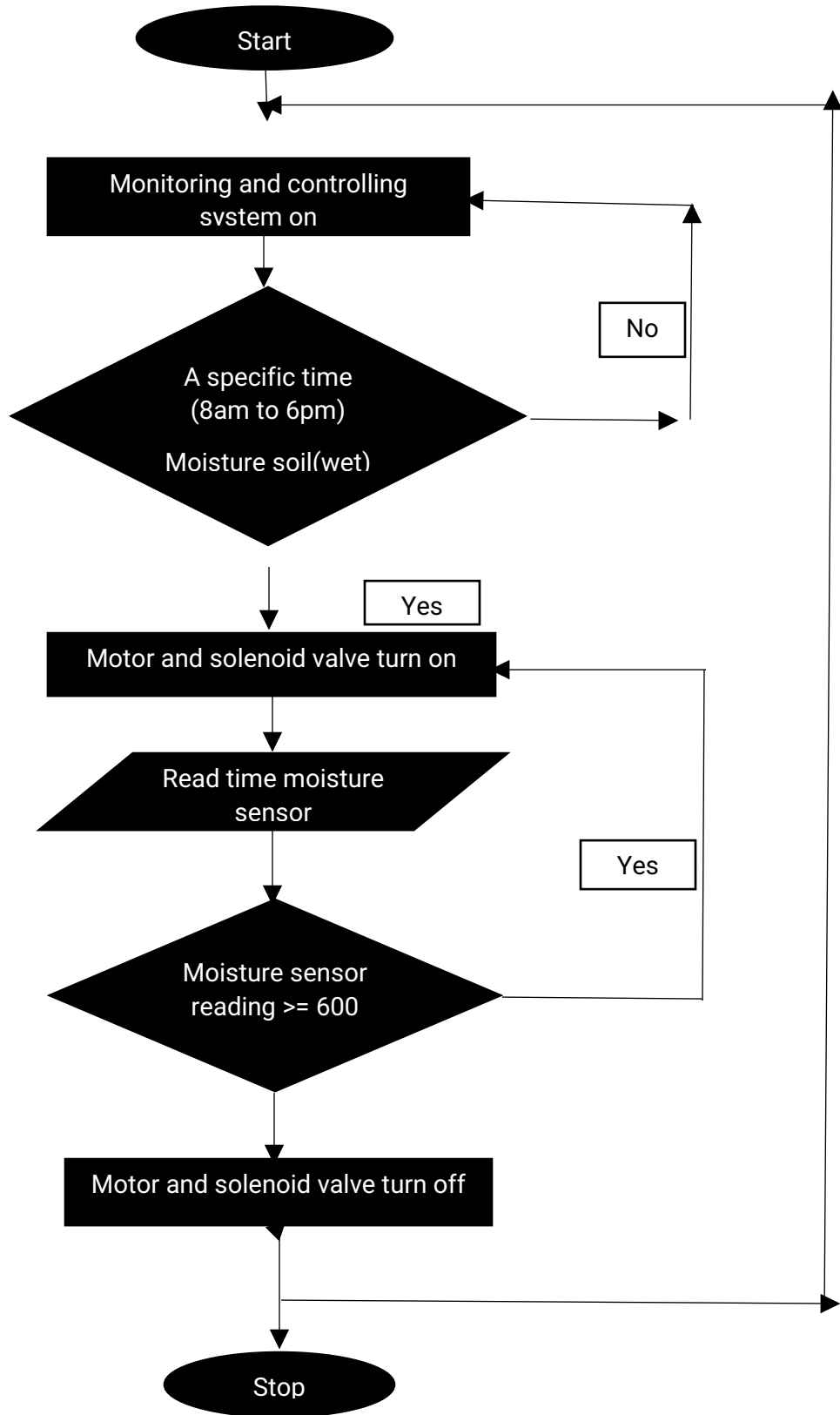
Motor and solenoid valve turns off.

STEP 8: Else

Monitoring and controlling system on

STEP 9: Stop.

FLOWCHART



3) BOTTOM TOP DESIGN OF THE SOFTWARE.

