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DEPARTMENT: MECHANICAL ENGINEERING

COURSE CODE: ENG 224 (STRUCTURED
COMPUTER PROGRAMMING)

DESIGNING AN AUTOMATED IRRIGATION SYSTEM SOFTWARE

Concept: The app is designed to make the irrigation system in ABUAD easier and better for one's usage. It is a software capable of reading the soil temperature, determining the moisture content of the soil, configure time interval for the water system, trigger an alarm if there is no sufficient water in the tank for the irrigation. It uses the moisture sensor to collect data from the soil and update a crop's status and transmit the information from the sensors to the irrigation system. The right time for water to flow is typed in the app which calculates when the water will flow, and the amount of water that will flow so as to save the resources of the farm. When there isn't enough water in the soil, an alarm will be triggered and the water sprinkler will turn on.

Hardware

- A laptop (PC)
- SMS controllers
- Temperature sensor
- Moisture sensor

Software

- GUI (Graphical User Interface); push button, dialogue box.
- Error detecting system
- Timer

- Design; Algorithm and Flowchart
- Coding; Python
- Testing and debugging; Some tests will be run in case of errors. The problems are logged into the problem tracking tool and is reset when fixed
- Maintenance; it's going to be free
- Release and updates; the app will be released soon and updated at regular intervals

1. Hardware and software features

- Hardware features: The app is developed using sensors that detect temperature and the moisture content of the soil. The farms uses the sprinkler irrigation system. Sensors are connected to the field and sprinkler do that the sprinkler can receive data from the field. The sensors provide real time updates on fluctuation of moisture and weather changes. All the data is collected by the laptop and the app can make some changes
- Software features: The app is developed using MS DOS. An IDE(a graphical user interface for source code editing, compiling, debugging and is a code free development) was used. Also, a user friendly interface was used in its development so that users can manipulate the system and device output that allows the system to indicate the effects of the user's manipulation. The timer is very essential to apply water in the necessary quantity and right time.

2. Algorithm

An algorithm showing how the app 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 ≥ 800

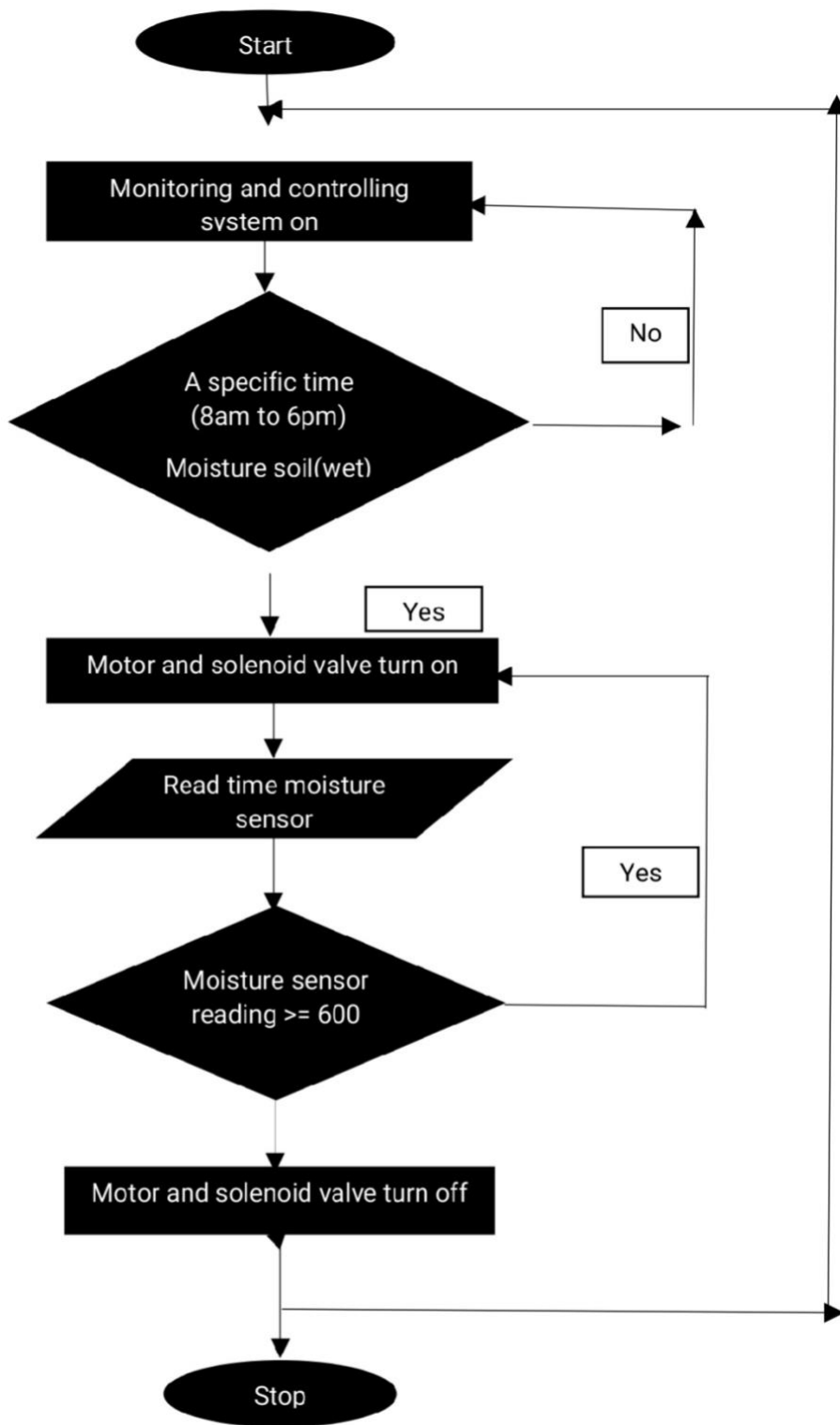
Motor and solenoid valve turn OFF

STEP 8: Else

Monitoring and controlling system, ON

STEP 9: Stop

Flowchart



3. Bottom-Top design of the irrigation system

