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A The application designed for the use of measurement, testing calculations, detection, store and transmit data would be suitable on a customized electronic device specifically for the application's purpose. The application will have different profiles for different soil testing samples. The application will request for the information of the soil when creating a new profile for testing. It will also request for a soil sample immediately after the profile has been created. The soil sample shall be placed in a storage compartment, where sensors will weigh the mass of the sample. The compartment will be heated within ~~the~~ a heating chamber, where all the water will dry out. The sensors will weigh the sample to know its dry mass.

The application shall measure the water content by finding the difference of mass between the sample before and after being heated. The value given will then be divided by the volume of the soil sample. The value gotten from this calculation is the moisture content of the soil.

If the value of moisture content is below a certain number, alarms shall be triggered and sprinklers shall be enabled across the farm land.

A sensor shall be placed within the soil to monitor the temperature changes.

The application will be safe-guarded by password-protected encryption.

## B Hardware Features

- i) Keyboard: The input of data when creating a new profile is implemented here
- ii) Sensors: The detection
- iii) Speakers: When the alarm has been triggered and personnel need to be notified
- iv) Monitors: This displays the interaction between the application and the user

## Software Features

- i) Graphical User Interface: The text on the monitor that aids communication between the user & program
- ii) Storage: Data of profile's details and their moisture content details
- iii) Cloud: This is for transmitting data to other applications, for the back-up of such information

## C Algorithm

- Step 1: Start
- Step 2: Name and Location = 0
- Step 3: Display "Input Name and Location"
- Step 4: Read Name and Location
- Step 5: Display "Soil Sample Needed"
- Step 6: Storage compartment Opens
- Step 7: Heat storage compartment
- Step 7: Measure soil sample (Moist) and Volume
- Step 8: Heat storage compartment
- Step

- Step 7: Mass of soil sample ( $M_{wet}$ ) &  $M_{dry}$  and Volume ( $V$ ) = 0  
 Step 8: Heat storage compartment  
 Step 9: Moisture content ( $M$ ) =  $M_{wet} - M_{dry} / V$   
 Step 10: Wet mass of soil sample ( $M_{wet}$  &  $M_{dry}$ ) and volume  
 Step 11: Display "Loading Result"  
 Step 12: Calculate  $M$   
 Step 13: If ( $M \leq 0.2$ )

~~Display (Water Needed)~~ Display (Water Needed)

Then Alarm is triggered

Step 14: If ( $M \leq 0.1$ )

Print (Insufficient Water) Display (Insufficient Water)

Step 15: Uploading results to Cloud

Step 16: End

### Flowchart





