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APPLICATION NAME: Kareem's Irrigator.

FUNCTION: The Kareem's Irrigator is basically used to read the temperature of the soil, determine the moisture content, identify, and alarm lack of water in the tank for irrigation.

SOFTWARE DEVELOPMENT CYCLE FOR "Kareem's Irrigator"

PLANNING → ANALYSIS → SOFTWARE DESIGN → TESTING → MAINTENANCE.

The creation cycle for the "**Kareem's Irrigator**" application starts from the PLANNING; The Kareem's Irrigator app was created from the pressing need to improve the ABUAD farm and solve its Irrigation problems. The application is aimed at creating a program that will remove or reduce the irrigation problem in the farm, create a device that will precisely identify the temperature and determine water levels. It is also secured so it can only be accessed by an admin.

Data Analysis will be carried out by integrating numerous data collected into the algorithm design, which includes;

- The average soil temperature which is between 19.4-23.9 °C.
- Night time and Day time temperatures.
- Time period the soil would need for regular moisture circulation for health nourishment. Etc.

The Application Design is shown below in a properly structured Flowchart and a well-defined algorithm.

IMPLEMENTATION: C++ code was implemented to integrate the algorithm into instructions that could be understood by the computer system.

TESTING: My application was tested on APENA Testing Facility, it was able to successfully determine the moisture content, read the temperature and sound an alarm when the moisture level is below the healthy condition.

MAINTENANCE: My application consists of a hardware device that can withstand the harshest of conditions also, every 9 months an application update would be released after minor bugs have been fixed.

HARDWARE COMPONENTS

The hardware components of my device consist of five wireless sensors and valve actuating nodes installed across the soil, a central base station made up of a transceiver connected to a laptop and a graphical user interface (GUI).

SOFTWARE COMPONENTS

The software components of the application consist of a C++ coded program, it has various sensors integrated into the system. An automated control system, with a wireless network across the soil. It works based on a combination of granular matrix sensors and soil water balance (SL+WB). It also has a security check to grant Administrator access.

SENSORS USED IN THE APPLICATION AND THEIR USES

Time-temperature threshold: To measure Temperature of the soil.

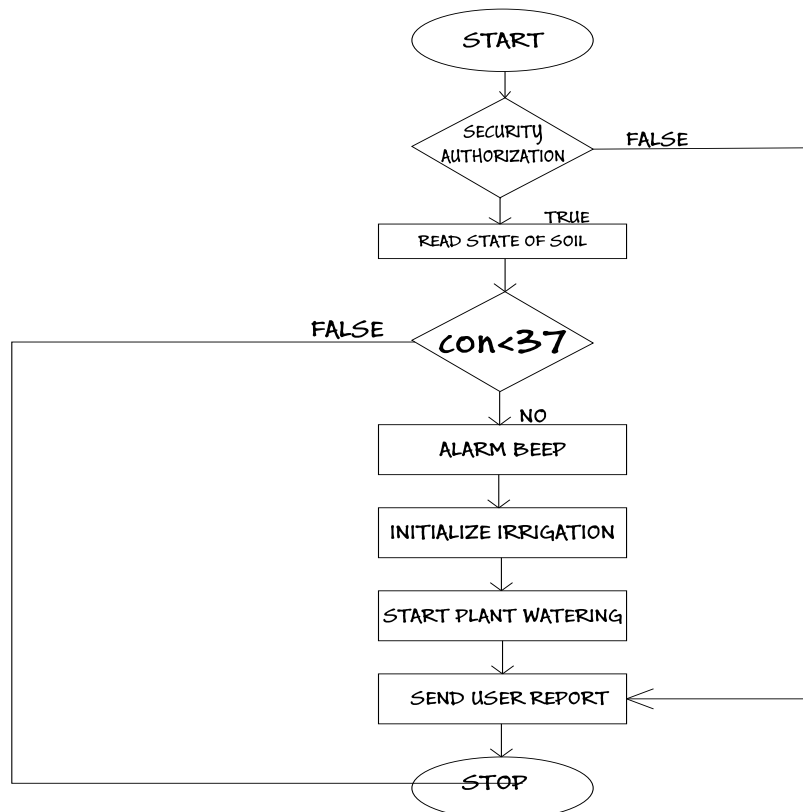
Neutron Probe: To identify the quantity of water.

Soil Water Balance sensor: To identify the Yield reduction.

Crop water stress Index: To know the water stress quantification.

Granular Matrix Sensor: To detect soil water potential.

FLOWCHART



ALGORITHM

1. Start.
2. Security Authorization.
3. Read Condition of soil (con).
4. Scan database and provide result.
5. Beep Alarm for unhealthy conditions.
6. Initialize irrigation.
7. Initialize watering system.
8. Scan for errors.
9. Stop.

TOP DOWN DESIGN APPROACH

