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IRRIGATION SYSTEM PROGRAM DEVELOPMENT

CONCEPTUALIZATION: The Afe Babalola University farm irrigation system did not function to an expected efficiency to yield maximum harvest. The purpose of this paper is to redesign that system to function at a better efficiency.

SPECIFICATION: From the product description, a machine system has already been built to carry out the various. This design paper is majorly focused on building the software operational system of the machine system earlier designed as well as the interaction between the components(I.e software and hardware)

DESIGN: The design involves the sensors of the machine system being placed at specific areas on the farm to test soil samples at those different areas. The soil sample sensors would be able to tell the temperature of the soil, soil type and structure, moisture and humidity content and also temperature around the environment.. The algorithm and flow chart would elaborated later.

IMPLEMENTATION: The program would be implemented using the following programs

1. Firebase SQL: For the programs database
2. Java & Java FX : For the structure and program construct
3. Some Programmable logic devices

TESTING AND DEBUGGING: After the program is built, it would be run and tested for any logical errors and debugged of any if found. Tried across different geological terrains and different soil types which also differ with regions. To ensure the program functions in the best efficiency.

RELEASE & UPDATE: The program would be released and used to for the coming dry season and if any recent development occurs, we would update the application to fit the new specifications.

2. HARDWARE FEATURES

The hardware features involves the machine system build up, that is, different sensors and actuators built in the system.

High Pressure Sprinklers: High Pressure sprinkles that themselves move in a circle are driven by a ball drive or impact mechanism. They would be buried in the ground.

Sprinkler water reserve: The sprinkler water reserve is responsible for monitoring the amount of water available for sprinkling and when it goes below a particular level it alerts the system

Tensiometers: This are devices used to measure the soil moisture tension. As the soil water dries, soil water tension(suction) increases, which draws water from a reservoir in the tensiometer through a porous vacuum tip. They must be constantly in the soil.

Thermometer: The Temperature of the soil can be tested with a thermometer either bimetallic, mercury in glass or electrical resistance thermometers which we would be using in this case.

SOFTWARE FEATURES:

MEASUREMENT: The soil sensors would be inbuilt with the irrigation sprinklers. The sensors would measure the soil humidity, temperature and texture and send to the to program's database.

LOGICAL STATEMENT AND CONDITIONS: The measure values would be compared against stored values and, if they exceed the stored values the sprinkles would activate saying dry season if else it won't because dry season is not here.

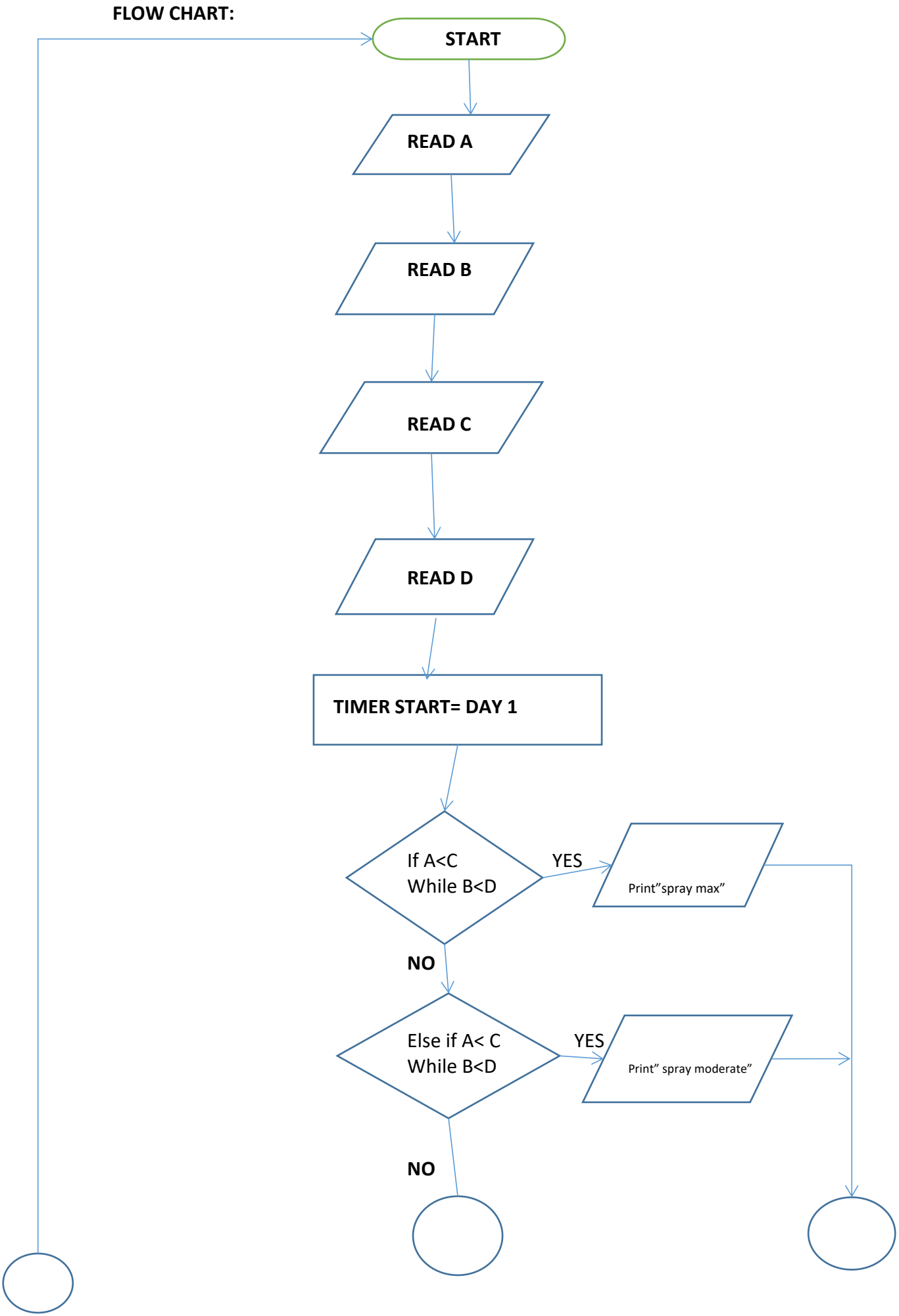
DISPLAY: The would be carried out every thirty days under the supervision of an exppert who would be in control of the password of the system.

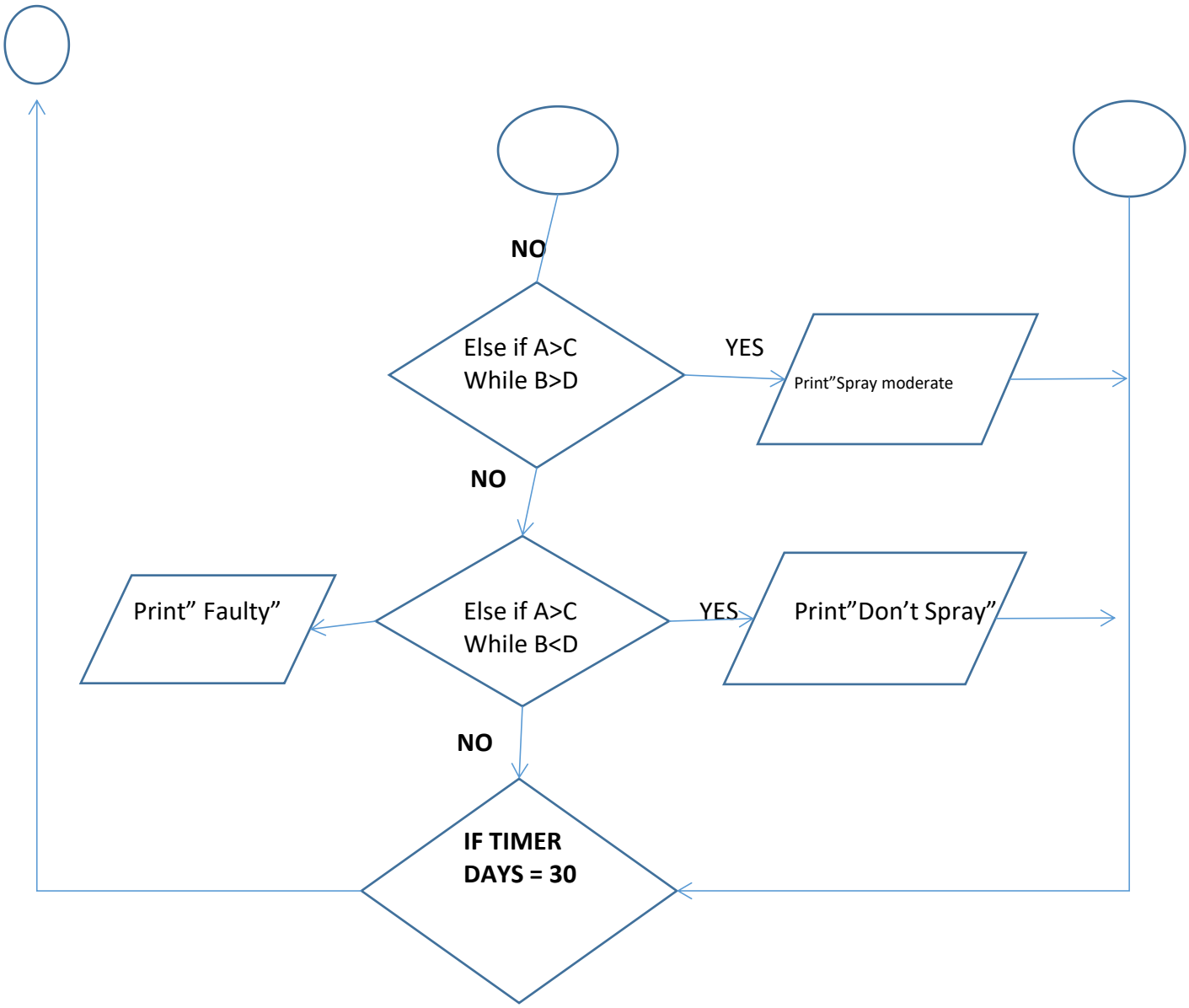
1. ALGORITHM & FLOW CHART

ALGORITHM:

START
READ A // Measured soil moisture
READ B //Measured soil temperature
READ C=65% //Stored soil moisture
READ D=30^{o}C //Stored soil temperature
Timer Start= Day 1 //Built-in Calender
If A<C
While B<D
Print"Spray sprinklers maximum"
Else if A< C
While B<D
Print "Spray moderate"
Else if A>C
While B>D
Print "Spray moderate"
Else if A>C
While B<D
Print"Don't Spray"
***
Hold on until
Timer = Day 1 //Timer counts to next month

FLOW CHART:


START
READ A
READ B
READ C
READ D
TIMER START= DAY 1
If A<C
While B<D
YES
Print"spray max"
NO
Else if A< C
While B<D
YES
Print" spray moderate"
NO



4.MODULAR DESIGN