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DEPARTMENT: ELECTRICAL/ELECTRONICS ENGINEERING

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ASSIGNMENT

A.)

Software development cycle is a process for planning, creating, testing and deploying an information system. The system development life cycle concept applies to a range of hardware and software configurations, as a system can be composed of hardware only, software only, or a combination of both. They are usually six stages in this cycle and these six stages have been used in the development of this application. These stages will be explained below:

i) Planning: An application development without a perfect plan to calculate the strength and weaknesses of the project will result in a meaningless software development. In this stage the problem must have been identified. The problem resulting to the development of this application is the irrigation system on ABUAD farm.

ii) Analysis: This stage is about analyzing the performance of the software at various stages and making notes on additional requirements. Analysis is very important to proceed to the next step.

iii) Design: Once the analysis is complete, designing the software is the next stage in the completion of the project. This stage helps to remove possible flaws by setting a standard and attempting to stick to it. Examples of programming languages that can be used in the designing Javascript, CSS, HTML etc.

iv) Development & Implementation: This stage is the stage in which the much work is done. In this stage, the actual task of developing the software starts here with data recording going on in the background. Once the software is developed, the stage of implementation comes in where the project goes through critical study to see if it is functioning properly.

v) Testing: The testing stage accesses the software for errors and documents bugs if there are any.

vi) Maintenance: Once the software passes through all the stages without any issues, it is to undergo a maintenance process wherein it will be maintained and upgraded from time to time to adapt to changes.

Concept of the application: This project is to develop a software that interacts with the machine and must also be able to read the temperature of the soil, determine the moisture content of the soil, configure the time interval for the water system, trigger an alarm if there is no sufficient water in tank for the irrigation and there should also be an enabled password for the system

B.) Critically discuss the hardware and the software features

1) Hardware features: The hardware components of this application will involve:

i) A thermometer that is used to measure the temperature that is whether cold or hot. Thermometers, most especially infrared thermometers are used to measure canopy temperatures for irrigation scheduling in arid regions.

ii) Infrared sensors could be used to measure canopy temperature without physically contacting the plant.

iii) Arduino: This switches on a water pump to provide water to the plant. It also triggers the alarm if the water is insufficient, then supplies the adequate water required.

iv) Hygrometer: This is used to sense the moisture level of the soil and a temperature sensor is used to sense the intensity of light, and is attached to arduino uno. When moisture level of soil goes below a particular value and temperature remains at low value, Arduino triggers water supply to soil. The hygrometer has both digital and outputs.

2.) Software features: The software features will include a database that will be used to store the records of the thermometer and also the hygrometer. There will be need for GUI(Graphical user interface). JavaScript will be used in designing the application.

C.)ALGORITHM

Step 1: Start the system at specific time

Step 2: input password

Step 3: check water level

Step 4: fill water if needed

Step 5: check soil temperature

Step 6: process procedure due to soil temperature

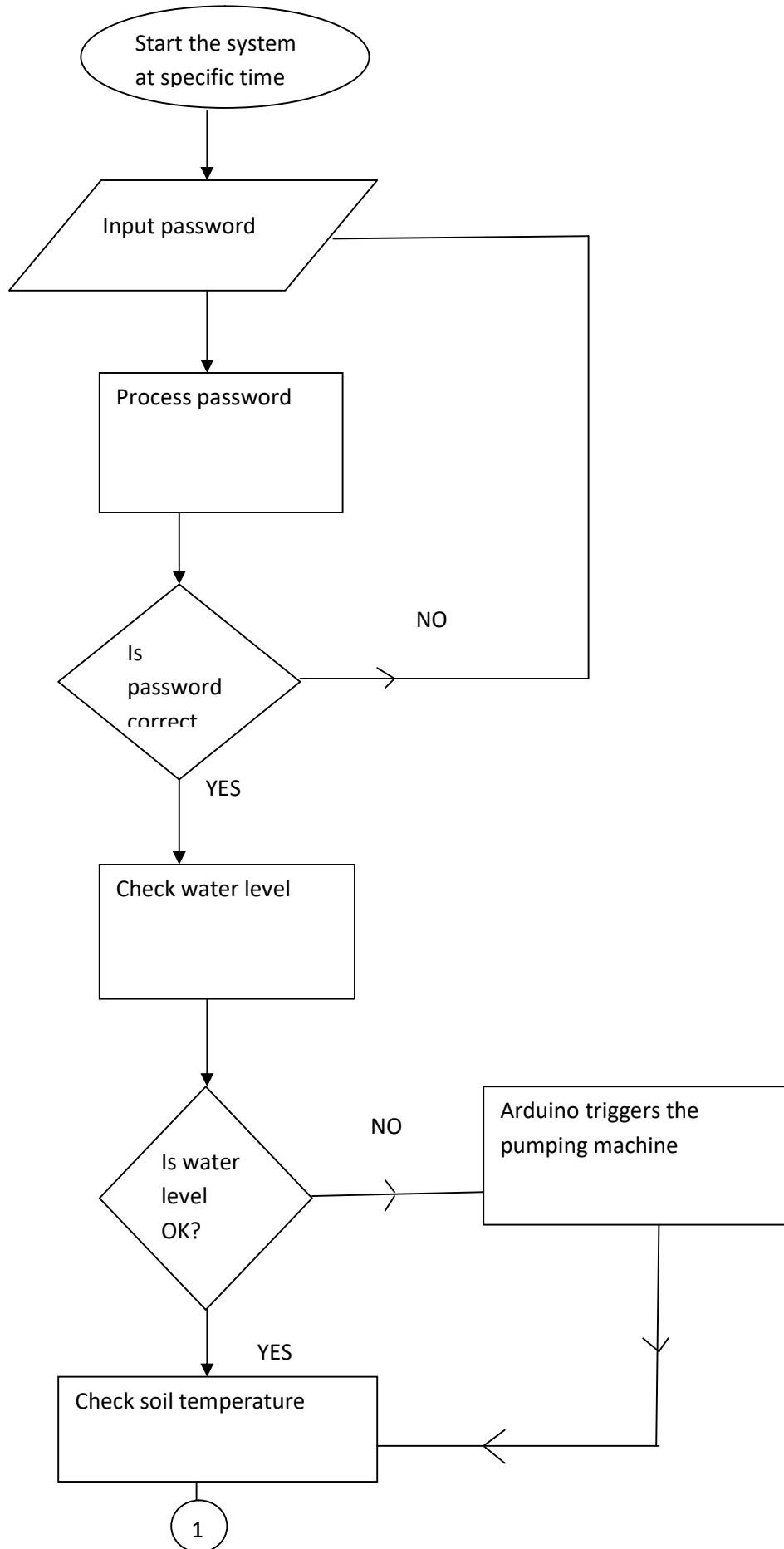
Step 7: check moisture content

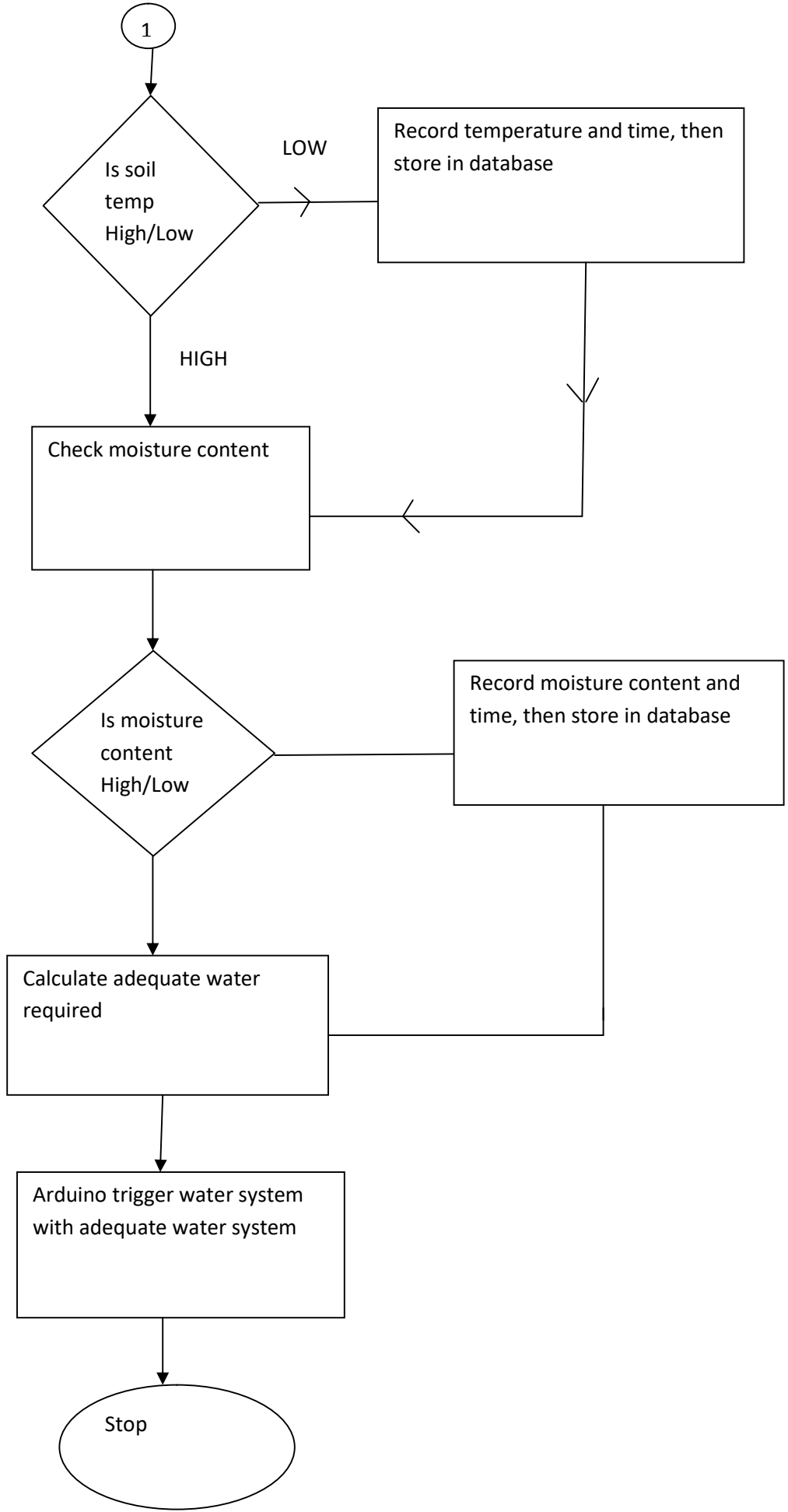
Step 8: calculate water needed based on moisture content temperature

Step 9: Arduino trigger water system to release adequate water

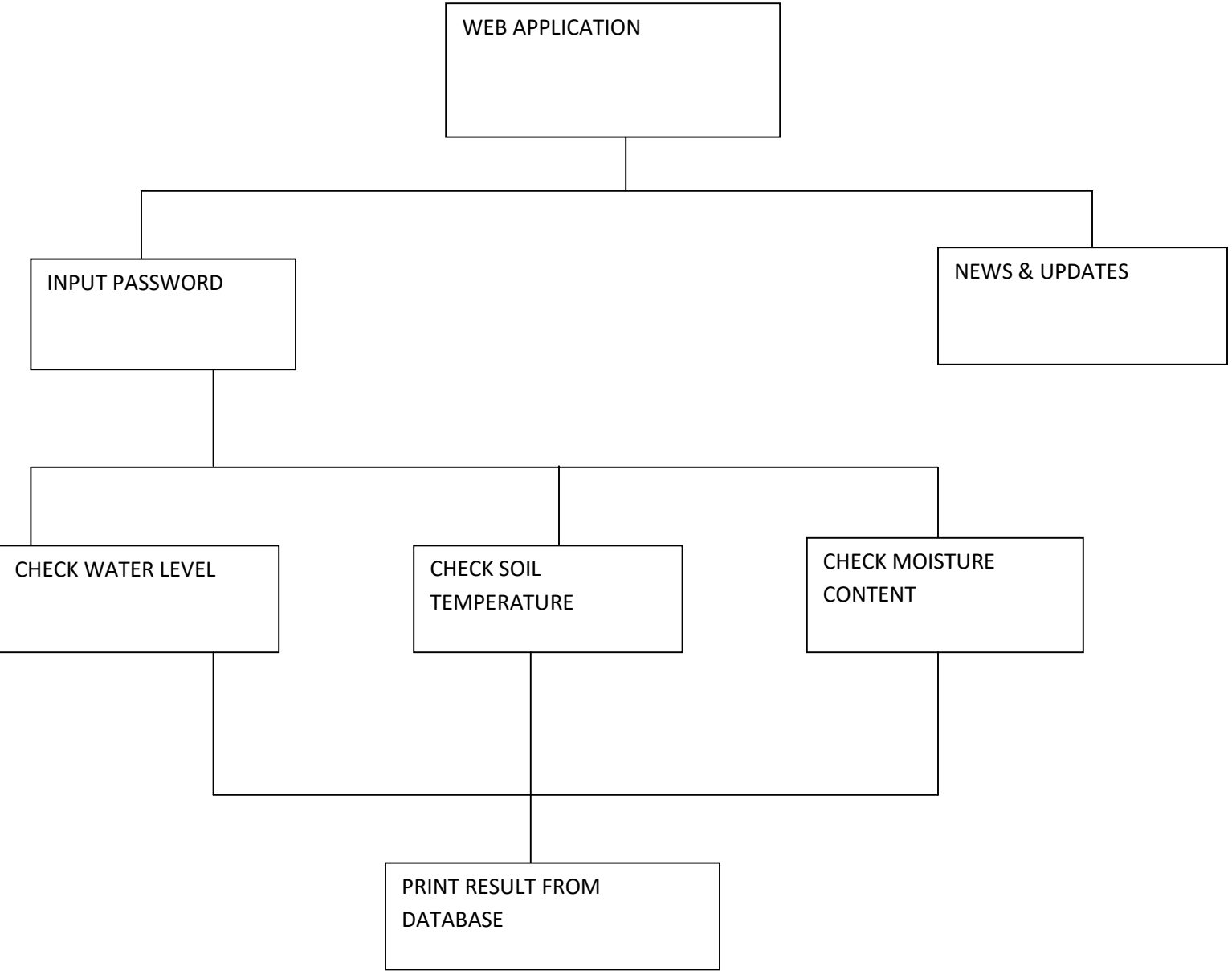
Step 10: stop system.

FLOW CHART





D.)Top-down Design approach of the application



TOP DOWN APPROACH