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DEPARTMENT: COMPUTER ENGINEERING

MATRIC NUMBER:18/SCI01/016

COURSE CODE: ENG224

COURSE TITLE: STRUCTURED COMPUTER PROGRAMMING

ALGORITHM

A. Discuss the application development following the software development cycle
   - Firstly, requirement and analysis is done. Once the requirement is gathered, the document created at this stage is the output for the Requirement phase and it acts as an input for the System Design.
   - In System Design phase, Software architecture and Design documents which acts as an input for the next phase are created i.e. Implementation and coding, flowchart, UML models, Hardware analysis, etc.
   - In the implementation phase, coding is done, and the software developed is the input for the next phase i.e. testing and hardware integration.
   - In the testing phase, the developed code is tested thoroughly to detect the defects in the software. Defects are logged into the defect tracking tool and are retested once fixed. Bug logging, Retest, Regression testing goes on until the time the software is in go-live state.

- In the Development phase, the developed code is moved into production after the sign off is given by the customer.
- Any issues in the production environment are resolved by the developers which come under maintenance.

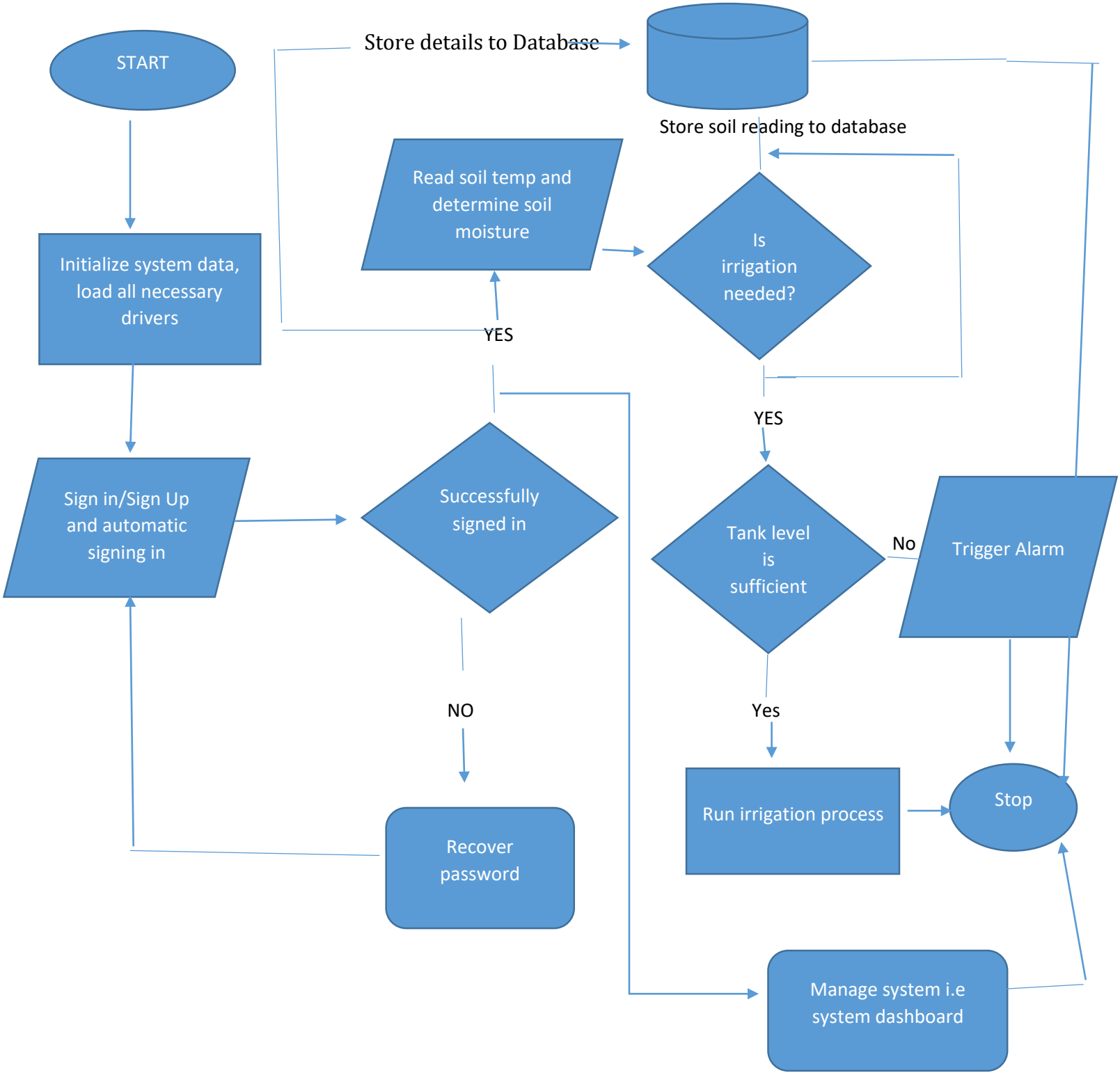
B. Critically discuss the software and hardware features

The software features will include Usability, Efficiency, Reliability, Maintainability, Portability, etc. In terms of Usability the software UI/UX will be spot on, as bad UI/UX will make it difficult for the ABUAD operators to use the software and the learning curve will be too steep for new ABUAD staffs. The stability and performance of the software is dependent on efficiency and reliability of the software code and tools used in the software development such as software framework, language. Maintainability and portability will be more effective after the software has been deployed, high maintainability and portability means that the software can be updated easily and portability will take care of how easy it will be for the software to be deployed on new system and also how easy it is going to be when transferring to other farms. Lastly, security is a very crucial feature of the software, poorly secured software means it can be hacked easily which might give rise to problems like DoS (Denial of Service).

Hardware features include availability, efficiency, durability, performance, etc. for the solution to be

effective, the hardware needs to be as good and effective as the software, this can be achieved through sound hardware. IoT features can be added making it possible to use the solution anywhere anytime.

C. Support your answer with a flowchart and algorithm



ALGORITHM

1. Start
2. Initialize all system resources
3. Sign in/sign up
4. If step 3 is successful go to step 6 else go to step 5
5. Try to recover the password then go to step 4
6. Read soil moisture and temperature and store sign in details to database
7. Store soil reading to database and check if irrigation is required if yes go to step 8 else go to step 11
8. Check if the water tank is sufficient if yes go to step 9 else go to step 10
9. Run irrigation process when done go to step 11
10. Trigger alarm
11. Stop

D. Draw the top-down or Bottom-up design approach of the application

TOP-DOWN APPROACH