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18/ENG05/031

MECHATRONICS ENGINEERING

ENG 224

SOFTWARE DEVELOPMENT CYCLE

Conceptualization:

An easily accessible application software that interacts with the irrigation system of a farm.

Specification:

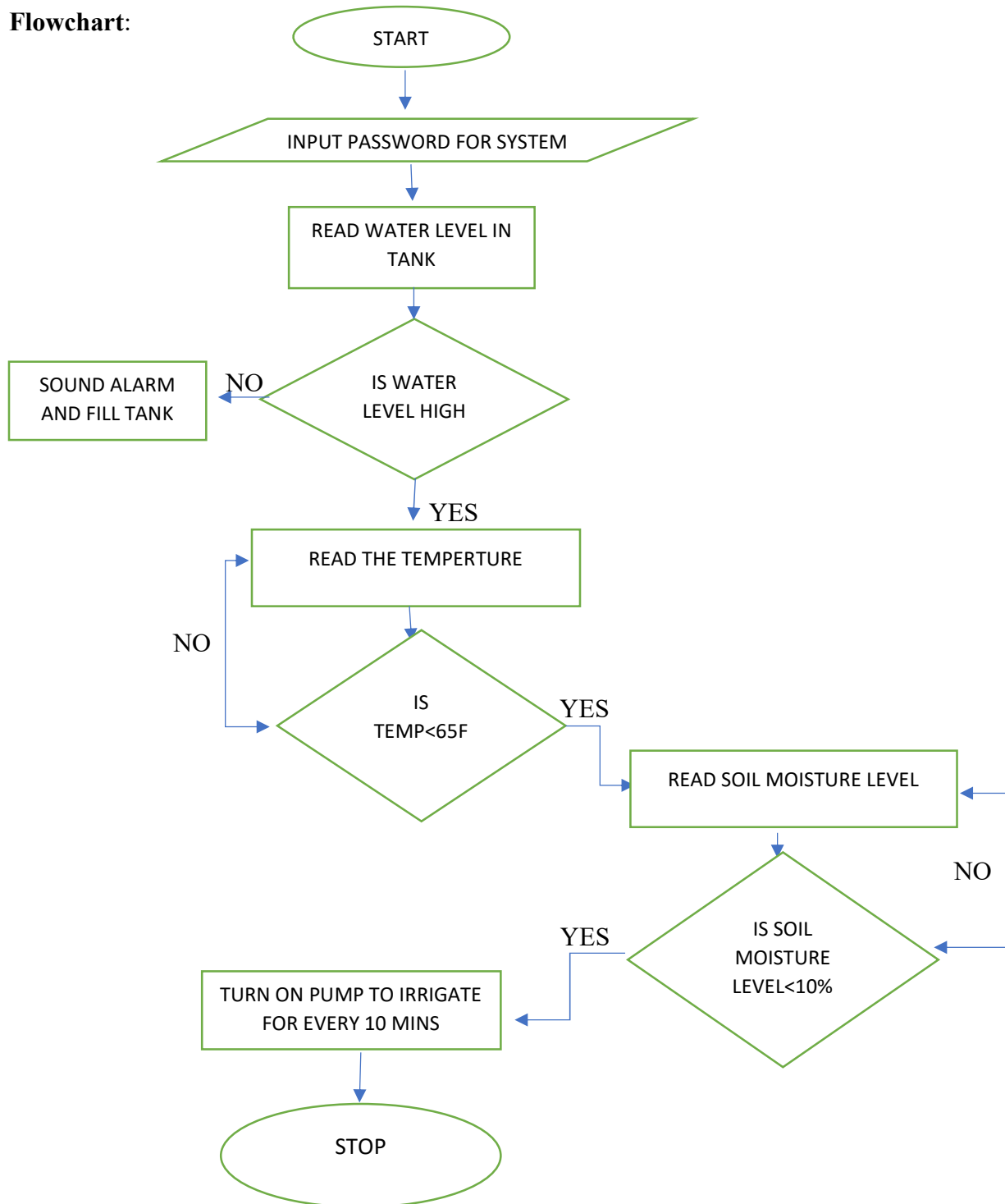
The software, through the machine, should be able to read the temperature of the soil, determine the moisture content of the soil, configure the time interval for the water system based on the temperature and moisture content that were previously read. It should also be able to trigger an alarm if there is no sufficient water in the tank for the irrigation and enable a password for the system. This is an application software that can be easily accessed by a common farmer or agriculturist.

Design:

Algorithm: step 1: start

- 2: input password for the system
- 3: read water level in tank
- 4: IF water level in the tank is high
- 5: read the temperature of the soil
- 6: ELSE sound alarm and fill the tank
- 7: IF soil temperature < 65F
- 8: read soil moisture level
- 9: IF soil moisture level < 10%
- 10: turn on pump to irrigate for every 10 minutes
- 11: stop

Flowchart:



Implementation: the application software can be implemented using the algorithm above with various programming languages. Bearing in mind that the application software should be able to interact with machine, some hardware parts of the machine would have to be changed or upgraded. It would most likely be implemented using ARDUINO or Raspberry Pi with high level programming languages like PYTHON, java, etc.

Testing And Debugging: errors usually pop up and are checked by testing it at various stages using diagnostic tools such as step in, break point, etc.

Release And Update: it will be released and available to the common farmer and/or agriculturists. It will have occasional updates.

THE HARDWARE AND SOFTWARE FEATURES

The software requirements include:

- Proteus Design Suite for simulation
- Arduino IDE for programming
- Android Studio for code editing, debugging and testing

The hardware requirements include:

- Soil moisture Sensor
- Water Tank level detector
- Arduino Uno development board
- Smart phone for password and alarm
- Thermometer to read soil temperature

