NAME; OGUNDARE EMMANUEL
MATRIC NUMBER; 18/ENG06/055

Classwork 2 **10Marks**

One of the major challenges of ABUAD farm, Ado Ekiti during the dry season is the irrigation system of the farm. The board of the company decided the best way to resolve the problem is to automate the system, as a software developer for ABUAD farm, you are mandated to develop software that interacts with the machine. The software through the machine must be able to:

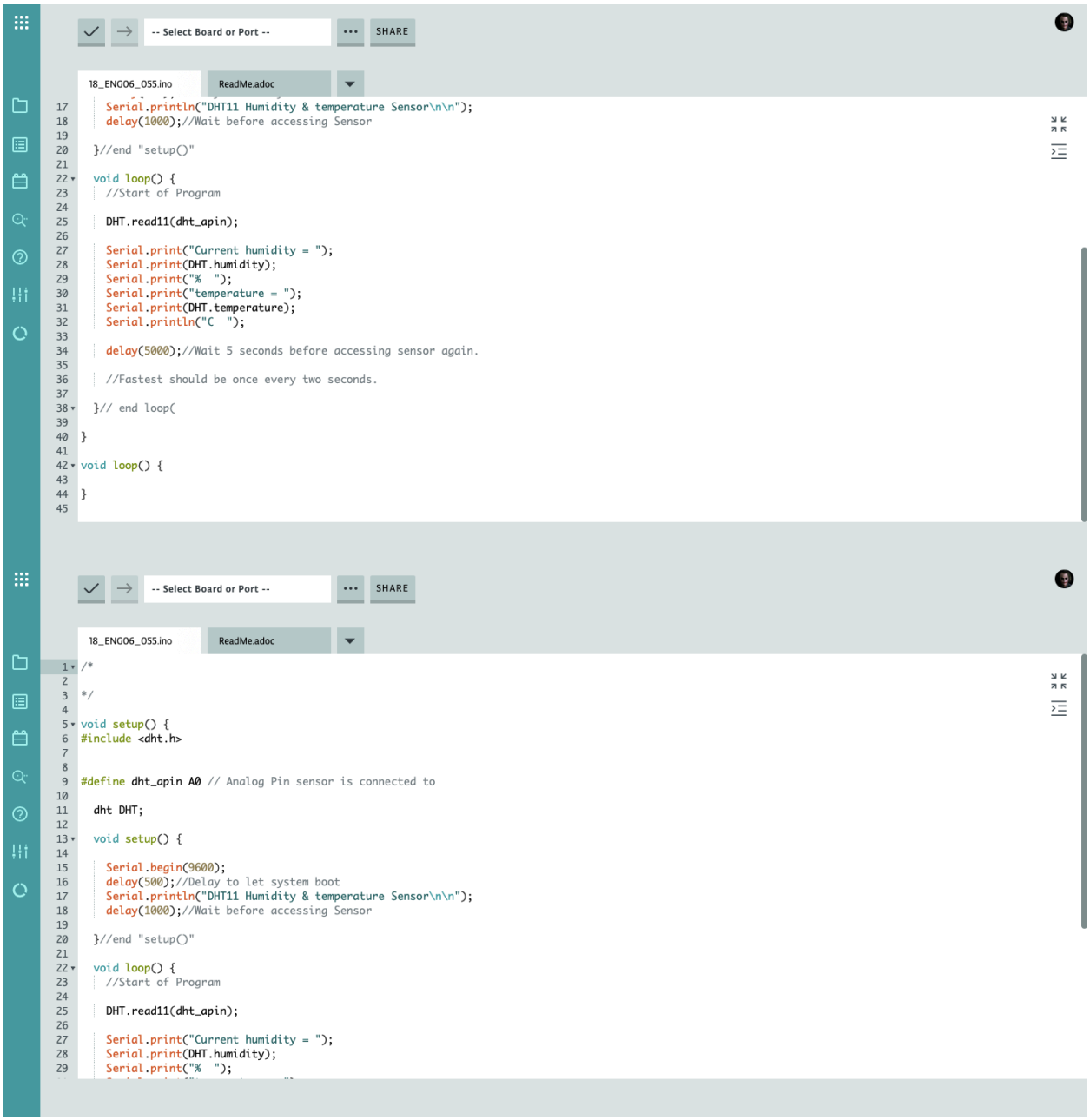
- Read the temperature of the soil.
- Determine the moisture content of the soil.
- Configure time interval for the water system based on the above.
- Triggered an alarm if there is no sufficient water in the tank for the irrigation.
- Enabled password for the system.

A. Discuss the application development following the software development cycle.
B. Critically discuss the hardware and software features.
C. Support your answer with a flowchart and an algorithm.
D. Draw the Top-down or Bottom-up design approach of the application.

PDF submission only, no copy and paste and copying from other students as I will not grade such.

Note: Bonus mark will be awarded for clarity and uniqueness.

A. Discuss the application development following the software development cycle.



-- Select Board or Port --

SHARE

18_ENG06_055.ino

ReadMe.adoc

```
  Serial.println("DHT11 Humidity & temperature Sensor\n\n");
  delay(1000);//Wait before accessing Sensor

 }//end "setup()"

 void loop() {
  //Start of Program

  DHT.read11(dht_apin);

  Serial.print("Current humidity = ");
  Serial.print(DHT.humidity);
  Serial.print("%  ");
  Serial.print("temperature = ");
  Serial.print(DHT.temperature);
  Serial.println("C  ");

  delay(5000);//Wait 5 seconds before accessing sensor again.

  //Fastest should be once every two seconds.

 }// end loop(

}

void loop() {

}
```


-- Select Board or Port --

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ReadMe.adoc

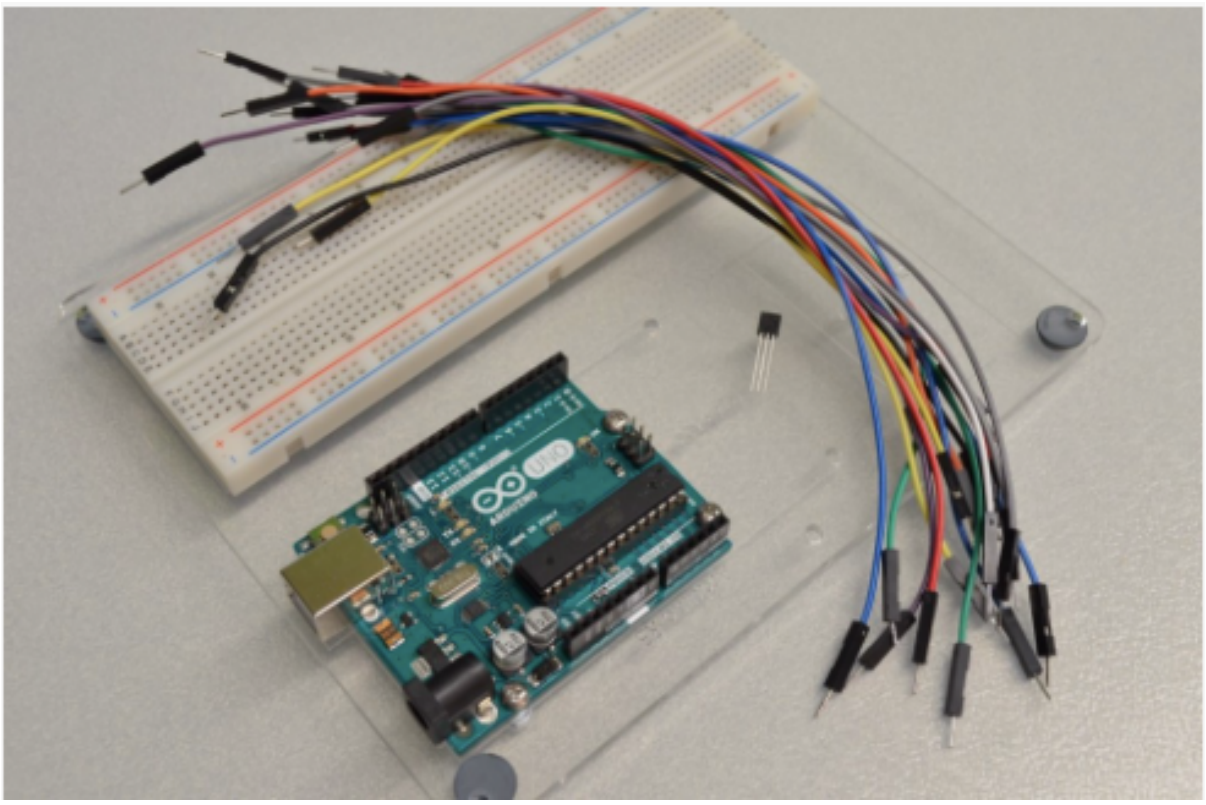
```
/*

*/

void setup() {
#include <dht.h>


#define dht_apin A0 // Analog Pin sensor is connected to

 dht DHT;

 void setup() {

  Serial.begin(9600);
  delay(500);//Delay to let system boot
  Serial.println("DHT11 Humidity & temperature Sensor\n\n");
  delay(1000);//Wait before accessing Sensor

 }//end "setup()"

 void loop() {
  //Start of Program

  DHT.read11(dht_apin);

  Serial.print("Current humidity = ");
  Serial.print(DHT.humidity);
  Serial.print("%  ");
```

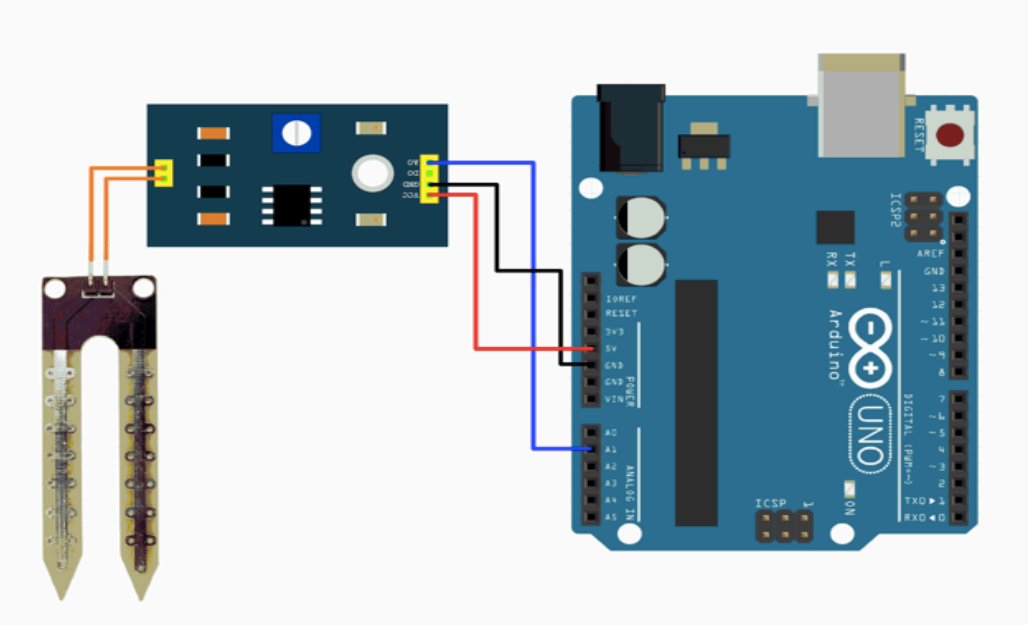
B. Critically discuss the hardware and software features.

Using A TMP36 Temperature & humidity Sensor With Arduino
The TMP36 temperature sensor is an easy way to measure temperature using an Arduino! The sensor can measure a fairly wide range of temperature (-50°C to 125°C), is fairly precise (0.1°C resolution), and is very low cost, making it a popular choice. In this tutorial we will go over the basics of hooking the TMP36 up and writing some basic code to read the analog input it is connected to.
A Few Considerations:
Before we jump into getting this TMP36 temperature sensor hooked up there are a few points to consider:
• This sensor is not weatherproof, so it will need to be shielded from direct exposure to the elements.

How It Works:
Unlike a thermistor, the TMP36 does not have a temperature sensitive resistor. Instead this sensor uses the property of diodes; as a diode changes temperature the voltage changes with it at a known rate. The sensor measures the small change and outputs an analog voltage between 0 and 1.75VDC based on it. To get the temperature we just need to measure the output voltage and a little bit of math!

1 x TMP36 Temperature Sensor
1 x Arduino Uno or compatible microcontroller
Hookup Wires – We recommend Premium Male/Male Jumper Wire




RESET
ICSP2
AREF
GND
13
12
~11
~10
~9
8
7
~6
~5
4
~3
2
TX→1
RX←0
L
TX
RX
ON
IOREF
RESET
3V3
5V
GND
GND
VIN
POWER
A0
A1
A2
A3
A4
A5
ANALOG IN
ICSP
Arduino
UNO
DIGITAL (PWM~)
TXD►1
RXD◄0

C. Support your answer with a flowchart and an algorithm.

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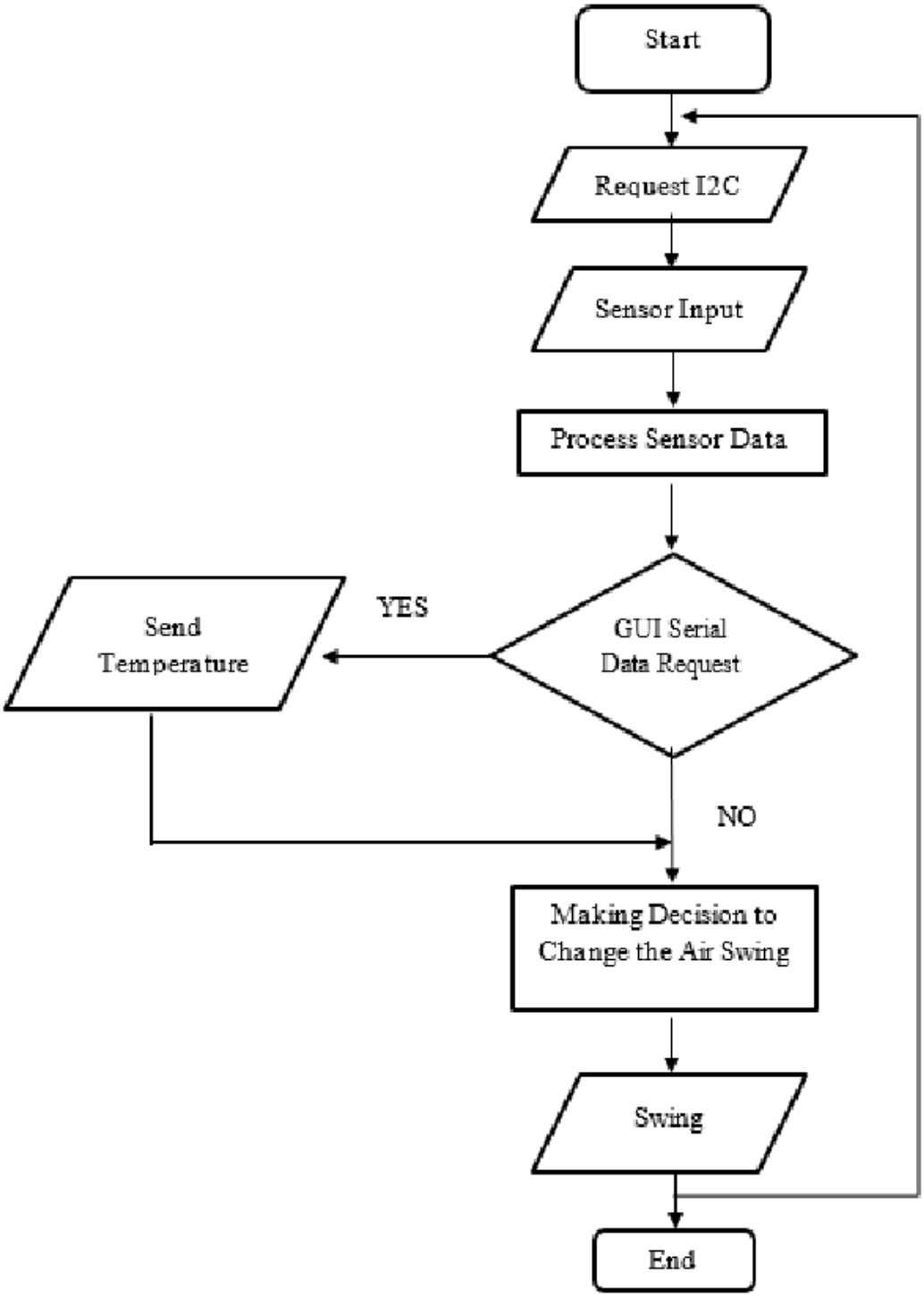

D. Draw the Top-down or Bottom-up design approach of the application.

This paper presents a Microcontroller based temperature-humidity measuring and control system which can be implemented in a poultry farm. The control of temperature and humidity have, overtime, become a major part of control systems operated in environment where these quantities are crucial entities. In this project, DHT11 temperature-humidity sensor is used for the sensing of the temperature and humidity of the poultry house, which is an input to the microcontroller. The microcontroller will get the temperature and humidity of the poultry from the temperature-humidity sensor and then compare it with the desired temperature for the poultry. If the measured temperature and/or humidity is not within the desired temperature and humidity of the poultry house, the control mechanism will be activated. The control of temperature and humidity is achieved through the use of some control mechanisms which include: fan, automated windows and heat source. The microcontroller used is the ATMEGA328p microcontroller. The temperature and humidity of the poultry is displayed on a Liquid Crystal Display (LCD). The result obtained is the control of the temperature and humidity of the poultry house.