INTERNET OF THINGS – GROUP 5

PROJECT: SMART WATER SYSTEM

NAME   : A.SHARUMITHA   NM ID: 752F3756FD0584B825147CBFA4A03AC4
REGNO : 950321104046

PHASE 4: Development Part 2

Smart Water System:

In the development part 2 of a Smart Water Management System, the focus should be on setting sensors and working with iot devices. Arduino boards are widely used for sensor data acquisition and actuator control. This code is written using the Arduino IDE to read sensor data, process it, and send it to a central server.
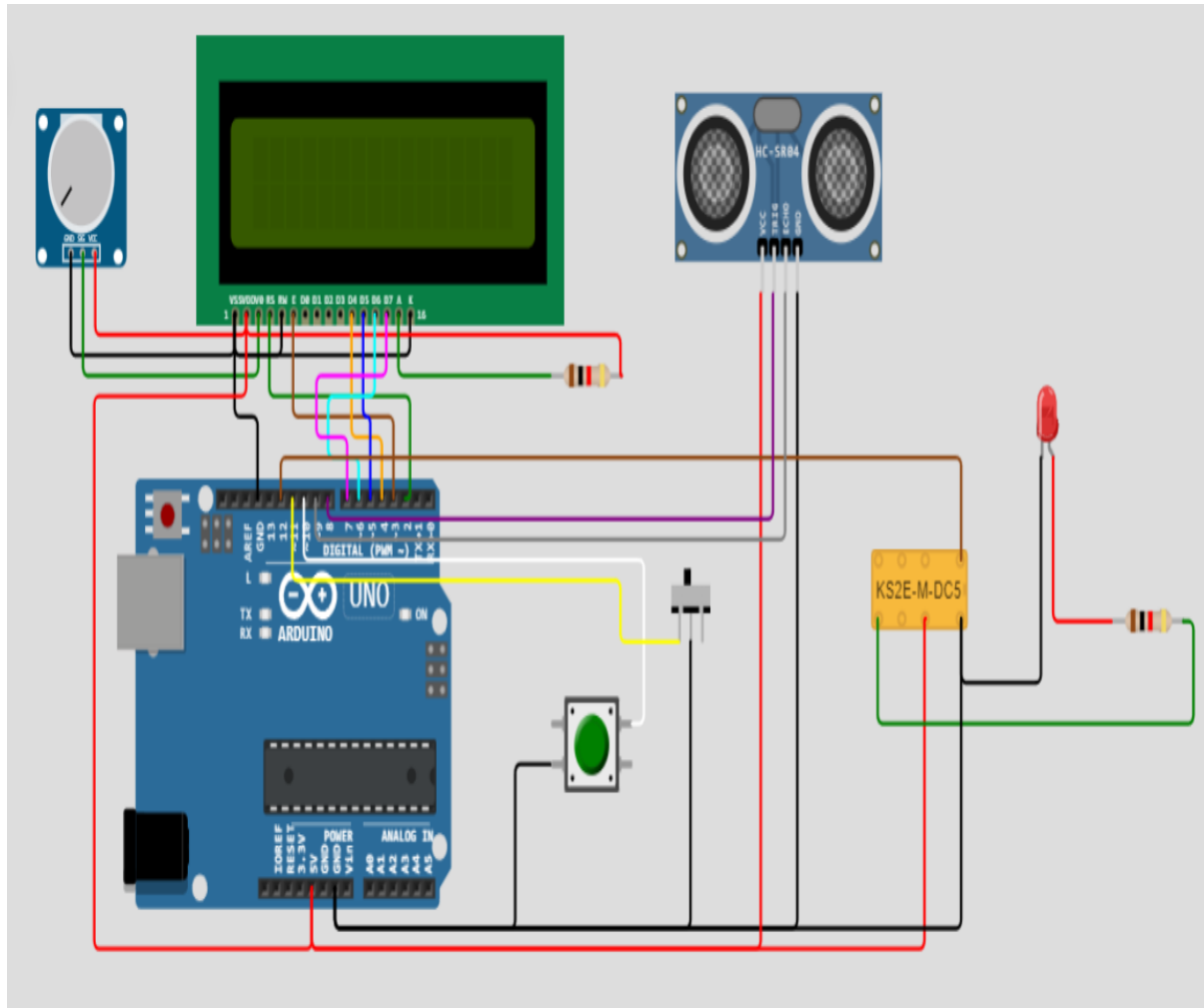
Water Level Monitoring:

Components of water level monitoring:

Some components are used to make the sensor work, to read the sensor data and displaying the process what doing now. The components are,

1. Arduino UNO
2. Potentiometer
3. lcd 1602
4. hc-sr04 Ultrasonic Distance sensor
5. pushbutton
6. slide-switch
7. ks2e-m-dc5 Relay

Connection of Arduino Board using Wokwi:

Source code for the above Arduino board:

```
#include <EEPROM.h>
#include <LiquidCrystal.h>
LiquidCrystal lcd(2,3,4,5,6,7);
long duration, inches;
int set_val,percentage;
bool state,pump;
void setup() {
  lcd.begin(16, 2);
  lcd.print("WATER LEVEL:");
  lcd.setCursor(0, 1);
```

```arduino
  lcd.print("PUMP:OFF MANUAL");
  pinMode(8, OUTPUT);
  pinMode(9, INPUT);
  pinMode(10, INPUT_PULLUP);
  pinMode(11, INPUT_PULLUP);
  pinMode(12, OUTPUT);
  set_val=EEPROM.read(0);
  if(set_val>150)set_val=150;
}

void loop() {
   digitalWrite(3, LOW);
   delayMicroseconds(2);
   digitalWrite(8, HIGH);
   delayMicroseconds(10);
   digitalWrite(8, LOW);
   duration = pulseIn(9, HIGH);
   inches = microsecondsToInches(duration);
   percentage=(set_val-inches)*100/set_val;
   lcd.setCursor(12, 0);

   if(percentage<0)percentage=0;
   lcd.print(percentage);
   lcd.print("%    ");
   if(percentage<30&digitalRead(11))pump=1;
   if(percentage>99)pump=0;
   digitalWrite(12,!pump);
   lcd.setCursor(5, 1);
   if(pump==1)lcd.print("ON ");
   else if(pump==0) lcd.print("OFF");
   lcd.setCursor(9, 1);
   if(!digitalRead(11))lcd.print("MANUAL");
   else lcd.print("AUTO   ");

   if(!digitalRead(10)&!state&digitalRead(11)){
      state=1;
      set_val=inches;
      EEPROM.write(0, set_val);
      }
      if(!digitalRead(10)&!state&!digitalRead(11)){
        state=1;
        pump=!pump;
      }
      if(digitalRead(10))state=0;
      delay(500);
}
long microsecondsToInches(long microseconds) {
   return microseconds / 74 / 2;
```
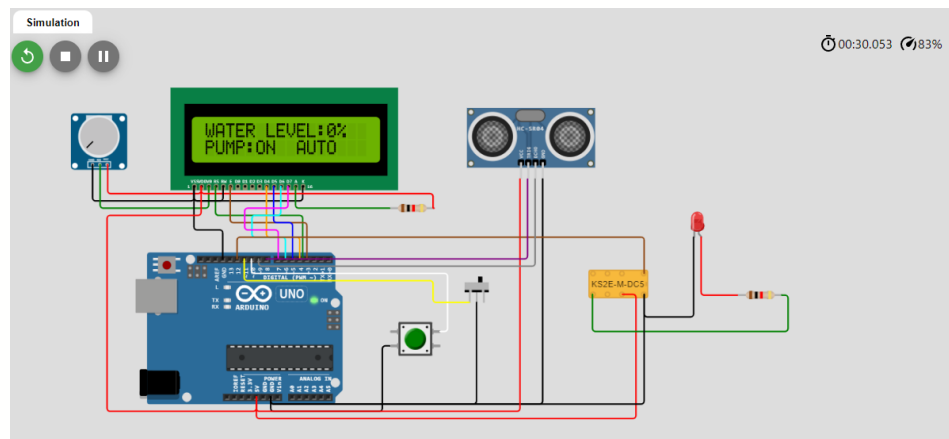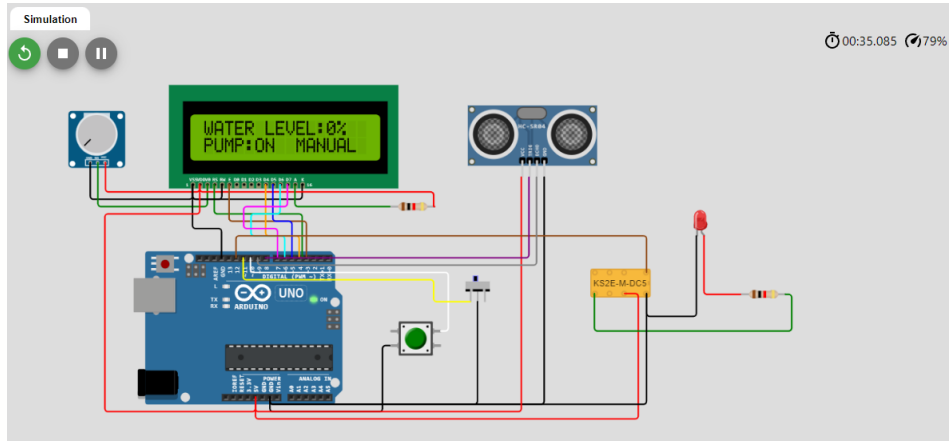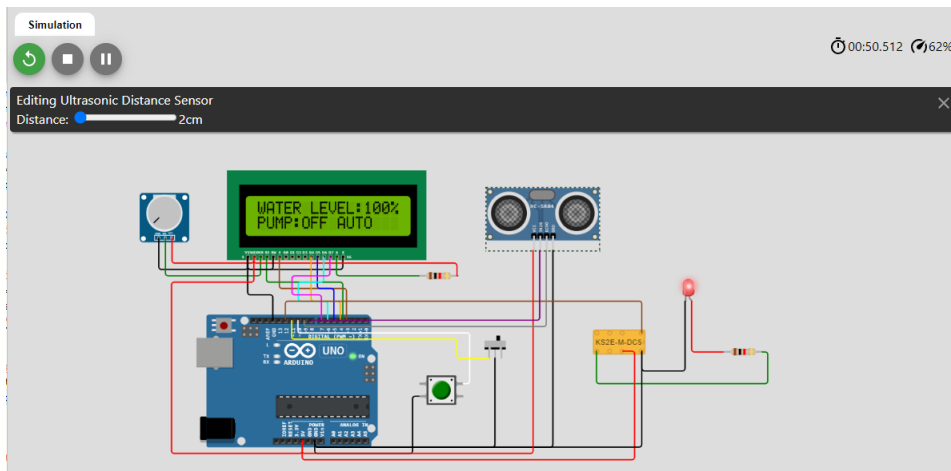
}

Output:

The pump is in manual mode, so we change the pump mode into auto-mode. In the beginning, the LCD display automatically displays 0% which means the tank is empty.


In the ultrasonic sensor we adjust the distance. If the distance is low then the water level is high. If the distance is high then the water level is low.

If the water level is 100% (the distance is less) then automatically the pump will be turned off. If the water level is 0% (the distance is high) then automatically the pump will be turned on.
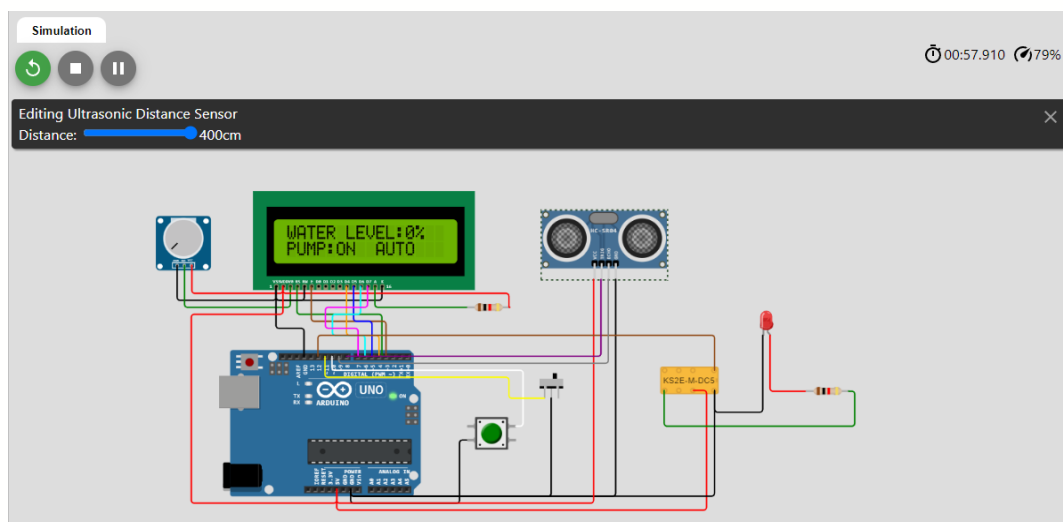
Similarly when we adjust the distances, the pump will automatically turn on and off.
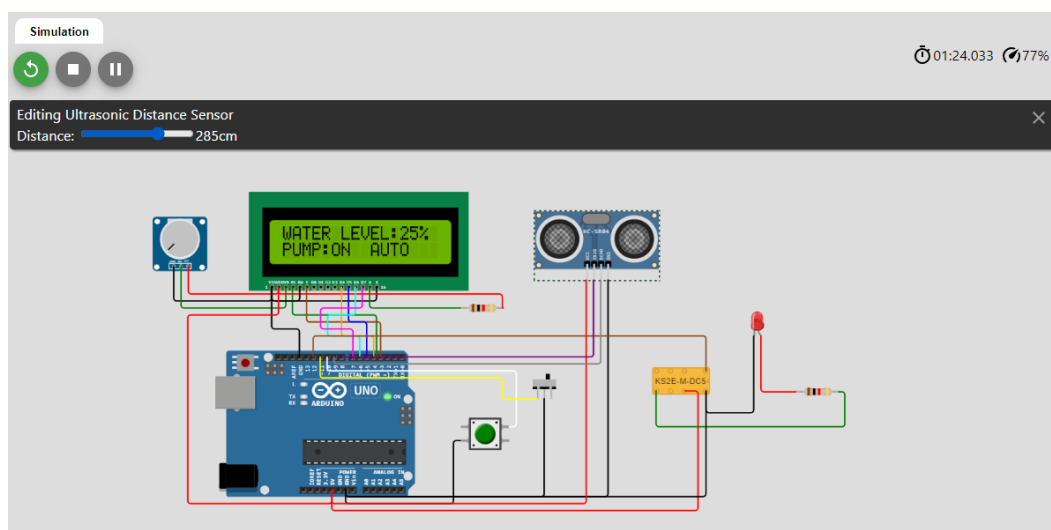
Conclusion:

In the smart water system and management there are many sectors like water level monitoring, monitoring the pH value, etc., In this phase, I have developed the water level monitoring by using Wokwi simulator by using the ultrasonic sensor. This sensor is used to calculate the distance between the water and the sensor.