PES UNIVERSITY

END SEMESTER ASSESSMENT (ESA)
B.TECH. (CSE)
IV SEMESTER

UE18CS256 – MICROPROCESSOR AND COMPUTER ARCHITECTURE LABORATORY

MINI PROJECT REPORT

ON

Water tank level detector

SUBMITTED BY

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ABSTRACT OF THE PROJECT:

Through this project we aim to build an automated water tank that notifies you when your water tank fills up. An ultrasonic distance sensor takes note of the water level in a water tank at every instance, and when the water level crosses a particular level(limit), the piezo buzzer goes on and the motor stops fetching water.

The components used in this project are:
- Ultrasonic distance sensor
- Piezo buzzer
- Arduino Uno R3
- DC motor
- L239D H motor bridge driver
- Bread board and wires

CIRCUIT DIAGRAM:
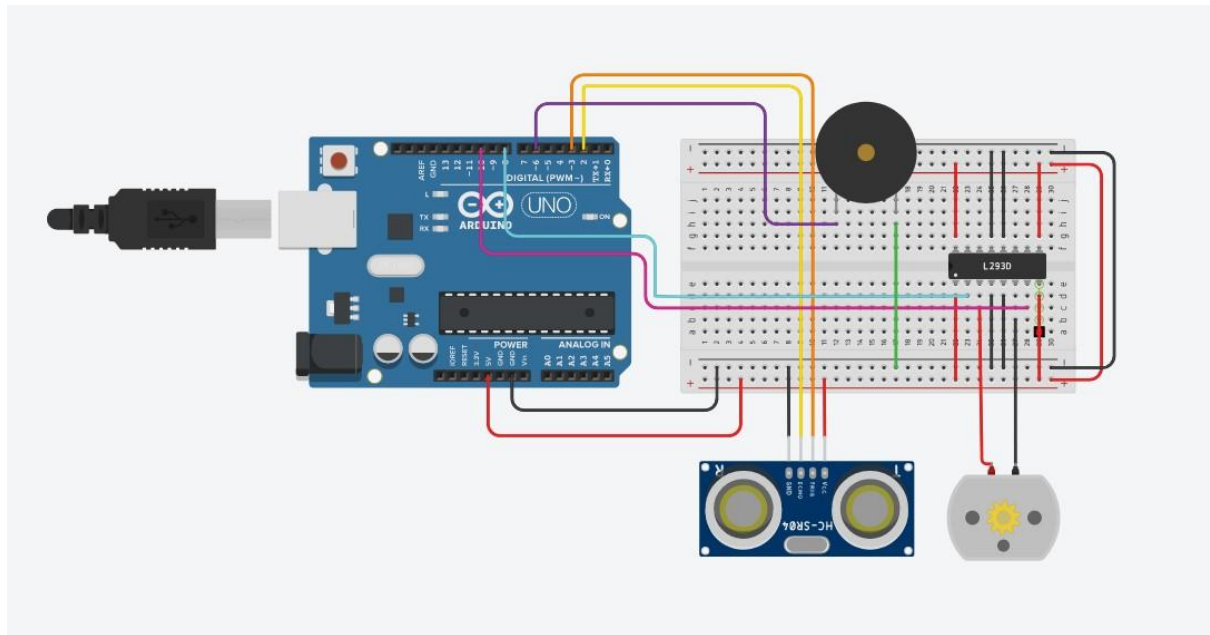
ARDUINO CODE:

```arduino
int waterLevel = 0;

long readUltrasonicDistance(int triggerPin, int echoPin)
{
  pinMode(triggerPin, OUTPUT);  // Clear the trigger
  digitalWrite(triggerPin, LOW);
  delayMicroseconds(2);
  // Sets the trigger pin to HIGH state for 10 microseconds
  digitalWrite(triggerPin, HIGH);
  delayMicroseconds(10);
  digitalWrite(triggerPin, LOW);
  pinMode(echoPin, INPUT);
  // Reads the echo pin, and returns the sound wave travel time in microseconds
  return pulseIn(echoPin, HIGH);
}

void setup()
{
  Serial.begin(9600);

  pinMode(8, OUTPUT);
  pinMode(10, OUTPUT);
  pinMode(6, OUTPUT);
}

void loop()
{
  waterLevel = 0.01723 * readUltrasonicDistance(3, 2);
  Serial.println(waterLevel);
  if (waterLevel > 200) {
    digitalWrite(8, HIGH);
    digitalWrite(10, LOW);
  }
  if (waterLevel < 100) {
    digitalWrite(8, HIGH);
    digitalWrite(10, HIGH);
    digitalWrite(6, HIGH);
  }
  digitalWrite(6, LOW);
  delay(10); // Delay a little bit to improve simulation performance
}
```
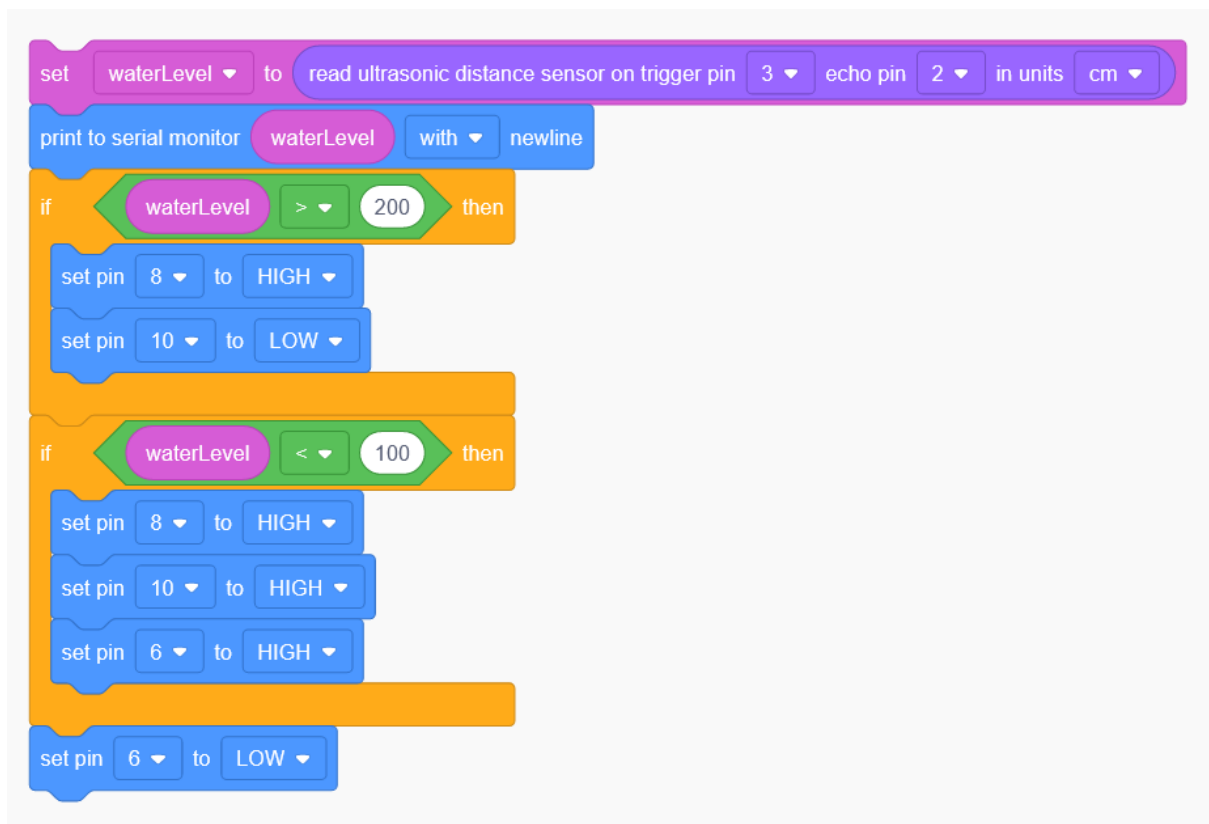
- Code in the form of blocks

```
set waterLevel to read ultrasonic distance sensor on trigger pin 3 echo pin 2 in units cm

print to serial monitor waterLevel with newline

if  waterLevel > 200  then
    set pin 8 to HIGH
    set pin 10 to LOW

if  waterLevel < 100  then
    set pin 8 to HIGH
    set pin 10 to HIGH
    set pin 6 to HIGH

set pin 6 to LOW
```
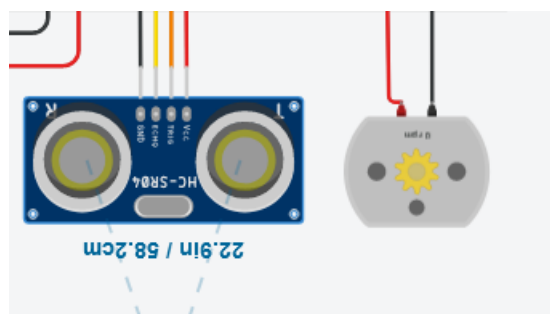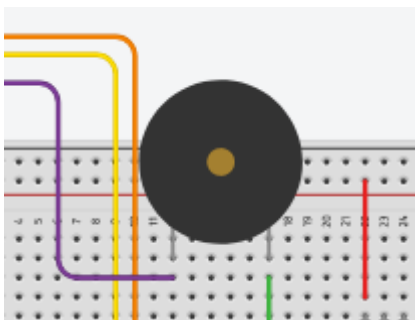
SCREEN SHOTS OF THE OUTPUT:

- When the water level is within the limits and the tank is yet to fill.
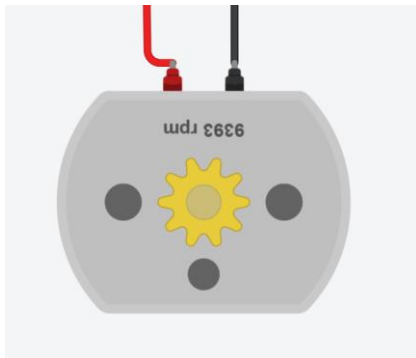 - The buzzer is off.
  - The DC motor is running too.
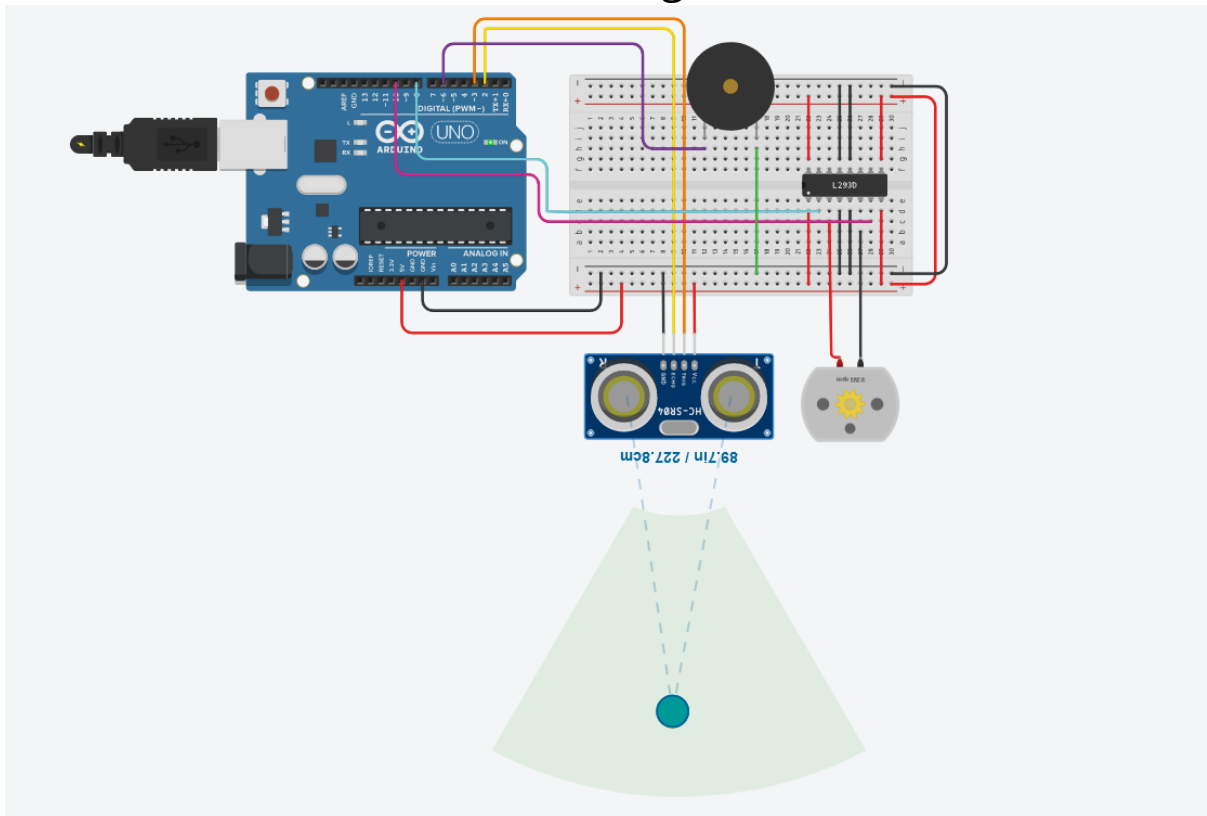
- The buzzer goes on and the DC motor stops working when the water level in the tank is below the limits. (100 to 200cm in this case)

- Serial monitor output:


```
87
87
85
106
108
113
127
137
```

- DC motor while in working condition.

REFERENCES

- Reference video on water tank level detector: https://www.youtube.com/watch?v=nmb4qhOKgso

- TinkerCad basics via TinkerCad YouTube channel: https://youtube.com/tinkercad

- Working with sensors and other TinkerCad components by MPCA Lab faculty: https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&cad=rja&uact=8&ved=2ahUKEwjbtI_b8YrwAhXGdCsKHd1FBQcQFjARegQIEBAD&url=https%3A%2F%2Fwww.instructables.com%2FWater-Level-Indicator-Using-Arduino-in-TinkerCad%2F&usg=AOvVaw0Lj40fVYqeN25bX5r7tMyK

- TinkerCad project demo video by seniors: https://drive.google.com/file/d/1Yt-koNVotj5KRSpaso-_2C-4saZrLsZx/view?usp=drive_web