Assignment – 4

Date	19 November 2022
Team ID	PNT2022TMID18648
Project Name	IoT Based Smart Crop Protection System for Agriculture
Maximum Marks	4 Marks

PROGRAM :

```
// ARDUINO PINS (TRIGGER PIN, ECHO PIN)
const int TRIG_PIN = 7;
const int ECHO_PIN = 8;

// Anything over 400 cm (23200 us pulse) is "out of range"
const unsigned int max_dist = 23200;

void setup() {

  // The Trigger pin will tell the sensor to range find
  pinMode(TRIG_PIN, OUTPUT);
  digitalWrite(TRIG_PIN, LOW);

  //Set Echo pin as input to measure the time duration of pulse returning back from the distance sensor
  pinMode(ECHO_PIN, INPUT);

  // We'll use the serial monitor to view the sensor output
  Serial.begin(9600);
```

```
}

void loop() {

  unsigned long t1;
  unsigned long t2;
  unsigned long pulse_width;
  float cm;
  float inches;

  // Hold the trigger pin high for at least 10 us
  digitalWrite(TRIG_PIN, HIGH);
  delayMicroseconds(10);
  digitalWrite(TRIG_PIN, LOW);

  // Wait for pulse on echo pin
  while ( digitalRead(ECHO_PIN) == 0 );

  // Measure how long the echo pin was held high (pulse width)
  // Note: the micros() counter will overflow after ~70 min
  t1 = micros();
  while ( digitalRead(ECHO_PIN) == 1);
  t2 = micros();
  pulse_width = t2 - t1;

  // Calculate distance in centimeters and inches. The constants
  // are found in the datasheet, and calculated from the assumed speed
  //of sound in air at sea level (~340 m/s).
  cm = pulse_width / 58.0;
  inches = pulse_width / 148.0;

  // Print out results
```

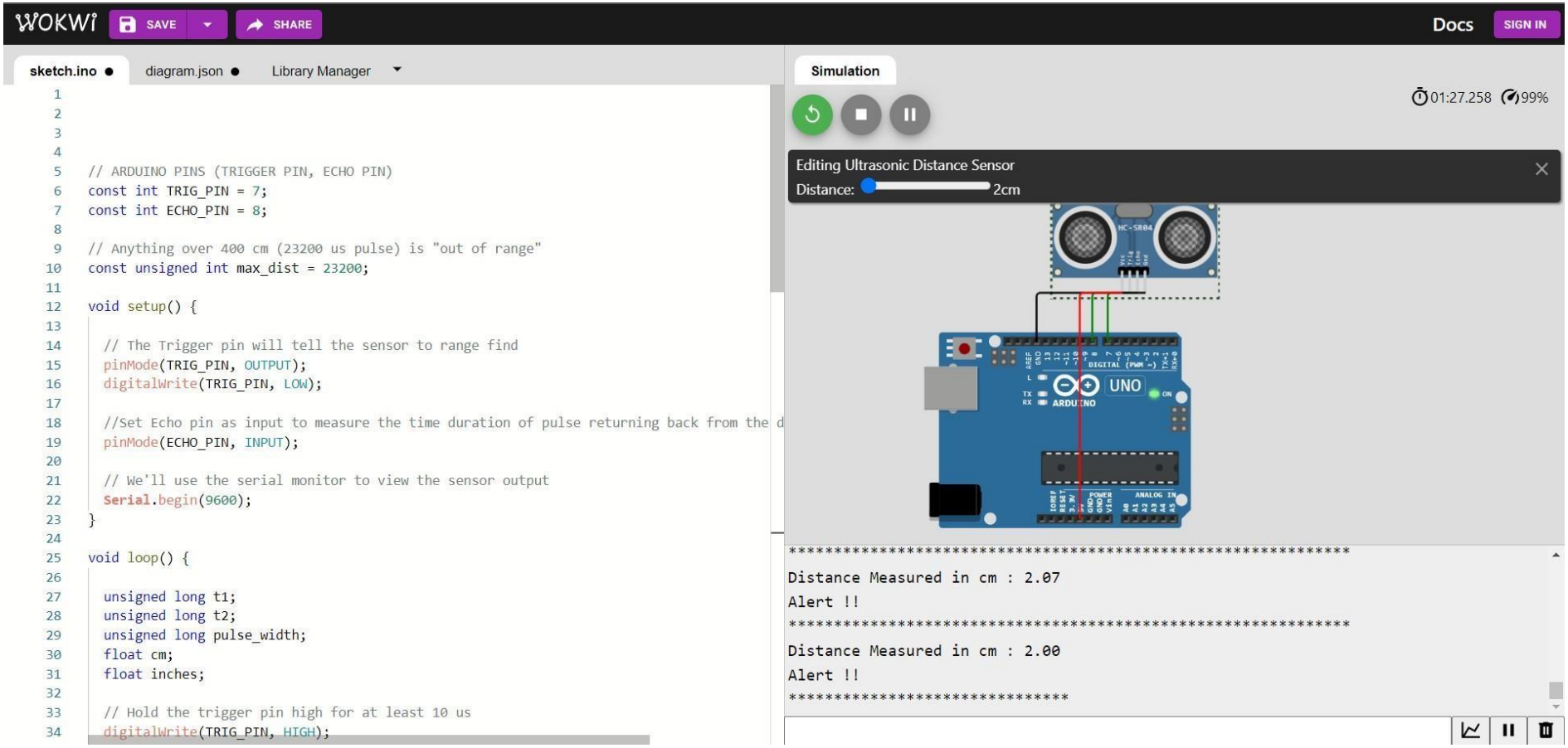
```
  if ( pulse_width > max_dist ) {
    Serial.println("Out of range");
  } else {
    Serial.println("*****************************");
    Serial.print("Distance Measured in cm : ");
    Serial.println(cm);

    if(cm<100){
      // while(true){
      Serial.println("Alert !!");
      // }
    }

    Serial.print("*****************************");
  }

  // Wait at least 1000ms before next measurement
  delay(1000);
}
```

OUTPUT :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sketch.ino
diagram.json
Library Manager
Simulation
01:27.258
99%
Editing Ultrasonic Distance Sensor
Distance:
2cm
HC-SR04
UNO
ARDUINO
// ARDUINO PINS (TRIGGER PIN, ECHO PIN)
const int TRIG_PIN = 7;
const int ECHO_PIN = 8;
// Anything over 400 cm (23200 us pulse) is "out of range"
const unsigned int max_dist = 23200;
void setup() {
// The Trigger pin will tell the sensor to range find
pinMode(TRIG_PIN, OUTPUT);
digitalWrite(TRIG_PIN, LOW);
//Set Echo pin as input to measure the time duration of pulse returning back from the d
pinMode(ECHO_PIN, INPUT);
// We'll use the serial monitor to view the sensor output
Serial.begin(9600);
}
void loop() {
unsigned long t1;
unsigned long t2;
unsigned long pulse_width;
float cm;
float inches;
// Hold the trigger pin high for at least 10 us
digitalWrite(TRIG_PIN, HIGH);
****
Distance Measured in cm : 2.07
Alert !!
****
Distance Measured in cm : 2.00
Alert !!
****

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sketch.ino ● diagram.json ● Library Manager

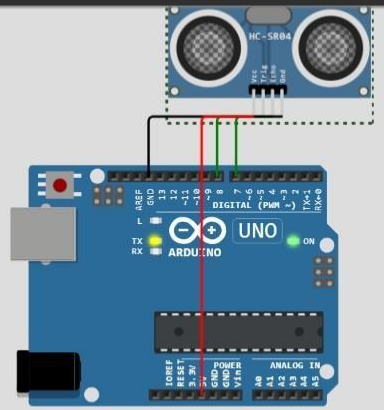
```
1
2
3
4
5   // ARDUINO PINS (TRIGGER PIN, ECHO PIN)
6   const int TRIG_PIN = 7;
7   const int ECHO_PIN = 8;
8
9   // Anything over 400 cm (23200 us pulse) is "out of range"
10  const unsigned int max_dist = 23200;
11
12  void setup() {
13
14    // The Trigger pin will tell the sensor to range find
15    pinMode(TRIG_PIN, OUTPUT);
16    digitalWrite(TRIG_PIN, LOW);
17
18    //Set Echo pin as input to measure the time duration of pulse returning back from the d
19    pinMode(ECHO_PIN, INPUT);
20
21    // We'll use the serial monitor to view the sensor output
22    Serial.begin(9600);
23  }
24
25  void loop() {
26
27    unsigned long t1;
28    unsigned long t2;
29    unsigned long pulse_width;
30    float cm;
31    float inches;
32
33    // Hold the trigger pin high for at least 10 us
34    digitalWrite(TRIG_PIN, HIGH);
```

Simulation

00:47.106 100%

Editing Ultrasonic Distance Sensor

Distance: 268cm




```
Distance Measured in cm : 271.79
************************************************************
Distance Measured in cm : 271.72
************************************************************
Distance Measured in cm : 271.72
************************************************************
Distance Measured in cm : 271.79
```