ASSIGNMENT 4

Ultrasonic sensor simulation in Wokwi

Question :

Write a code and connections in wokwi for the ultrasonic sensor. Whenever the distance is less than 100cms send an “Alert” to IBM cloud and display in the device recent events.

Code:

```
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 duration of
  //pulses coming 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
```

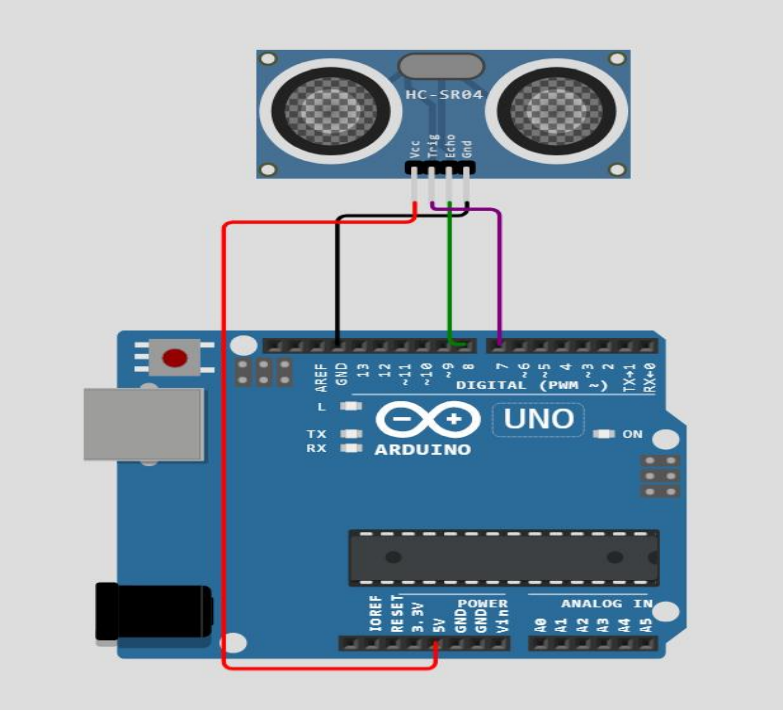
```
  while ( digitalRead(ECHO_PIN) == 0 );
  // Measure how long the echo pin was held high (pulse width)
  // Note: the micros() counter will overflow after ~70 min
  t1 = micros();
  while ( digitalRead(ECHO_PIN) == 1);
  t2 = micros();
  pulse_width = t2 - t1;
  // Calculate distance in centimeters 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.print(cm);
    Serial.print(" cm \t");
    Serial.print(inches);
    Serial.println(" in");
  }
  // Wait at least 60ms before next measurement
  delay(60);
}
```

Diagram(json):

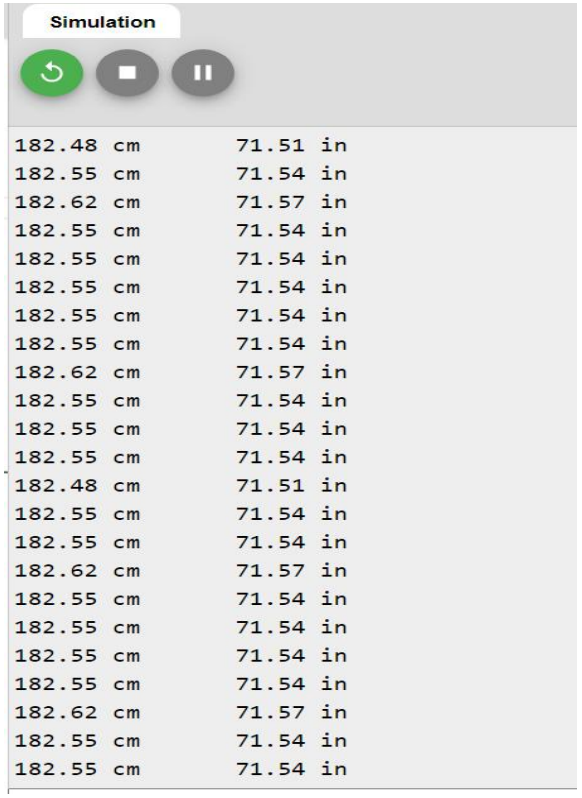
```
{
  "version": 1,
  "author": "yuvi",
  "editor": "wokwi",
  "parts": [
    {
      "type": "wokwi-arduino-uno",
      "id": "uno",
      "top": 259.31,
      "left": 31.06,
      "rotate": 0,
      "hide": false,
      "attrs": {}
    },
    {
      "type": "wokwi-hc-sr04",
      "id": "ultrasonic",
      "top": 86.99,
```

```
      "left": 109.89,
      "rotate": 0,
      "hide": false,
      "attrs": { "distance": "180" }
    }
  ],
  "connections": [
    [ "uno:GND.1", "ultrasonic:GND", "black", [ "v-8", "*", "v8" ] ],
    [ "uno:8", "ultrasonic:ECHO", "green", [] ],
    [ "uno:7", "ultrasonic:TRIG", "purple", [ "*", "v4" ] ],
    [ "uno:5V", "ultrasonic:VCC", "red", [ "v16", "h-96", "*", "v12" ] ]
  ]
}
```

CIRCUIT DIAGRAM:



OUTPUT:



Wokwisimulation link:

https://wokwi.com/projects/290962720810861064