Assignment - 4

Question-1:

Write code and connections in wokwi for ultrasonic sensor.Whenever distance is less than 100 cms send "Alert" to ibm cloud and display in device recent events.

Solution:

// Pins

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 tl;

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 tl = micros();

while ( digitalRead(ECHO\_PIN) == 1);

t2 = micros();

pulse\_width = t2 - tl;

// 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("The Measured Distance in cm :");

Serial.println(cm);

if(cm<100){

// while(true) {

Seri al.println(" Alert!!");

// }"

Serial pnnt(’’\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*” } // Wait at least 1000ms before next measurement delay(lOOO);

}

Output:

1) If the distance is less than 100 cms, it alerts.

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1. // Pins
2. const int TRIG\_PIN = 7;
3. const int ECH0\_PIN ■ 8;

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1. // Anything over 400 cm (23200 us pulse) is "out of range"
2. const unsigned int MAX\_DIST - 23280;

7

1. void setup() {

9

18 // The Trigger pin will tell the sensor to range find

1. pinMode(TRIG\_PIN, OUTPUT);
2. digltall.’ ：te(TRIG\_PIN, LOW);

13

1. //Set Echo pin as input to measure the duration of
2. "pulses coning back from the distance sensor
3. pipHode(ECHO\_PIN, INPUT);

17

1. // We'll use the serial nonltor to view the sensor output
2. Serial.begin(96ee);
3. }

21

1. void loop() {
2. I
3. unsigned long tl;
4. unsigned long t2;
5. unsigned long pulse\_width;
6. float cm;
7. float inches;

29

1. // Hold the triaaer pin high for at least 10 us

Simulation

The Measured Distance in cm : 84.14 Alert!!

2) If the distance is more than 100 cms, it won't alert.

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1. // Pins
2. const int TRIGPIN = 7;
3. const int ECHO\_PIN = 8;

4

1. // Anything over 400 an (23200 us pulse) is "out of range'
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7

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23

1. unsigned long tl;
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5. float inches;

29

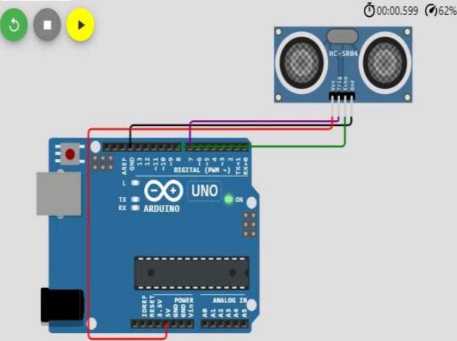
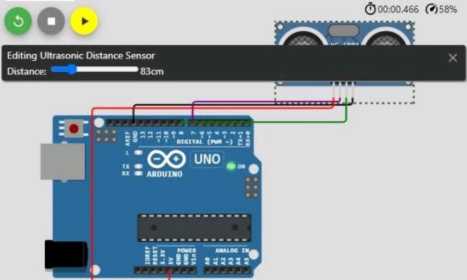
1. // Hold the trigger pin high for at least 10 us

Simulation

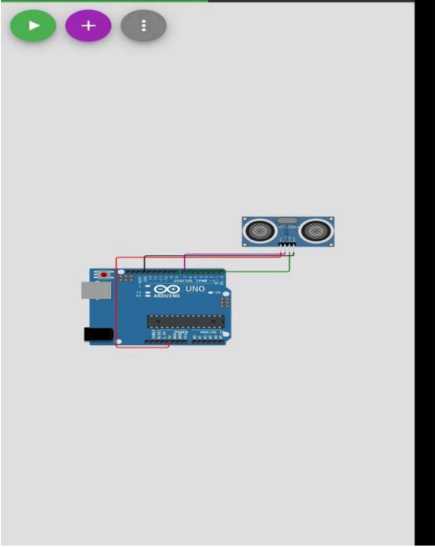
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The Measured Distance in cm : 227.10 **»\*\*\*\*\*\*\*»\*:««\*\*««\*\*\*\*\*\*»«»\*\*\*\*4：4：**

Activate Windows



3) Simulation and code execution



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const unsigned int MAX.OIST • 232M; void MtupO <

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// We'll use the »rial aanlto\* tn vim the lense' output Serial.I»fin(9eoo);

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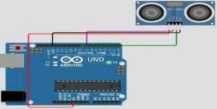
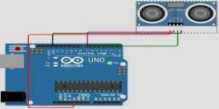
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Editing Ultrasonic Distance Sensor Distance: 1 99cm



The Measured Distance in cm : 201.79

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The Measured Distance in cm 57.79 Alert it !!

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