

1. Write Code and connections in wokwi for ultrasonic sensor. whatever 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
  Pin Mode(TRIG_PIN, OUTPUT);
  digital Write(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 (~ 340m/s)
cm=pulse_Width / 58 ;
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);

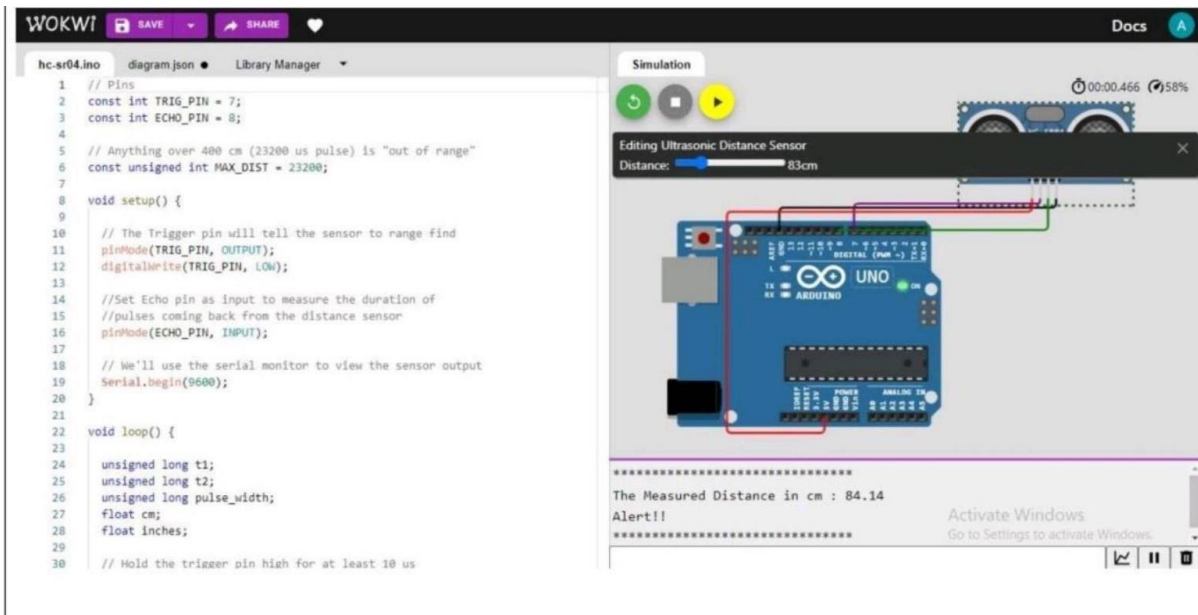
if( cm < 100 ){
    //while(true){
        Serial.println("Alert!!");
        //}
    }
Serial.print("*****");
}

//wait at least 1000ms before next measurement
Delay(1000);
}

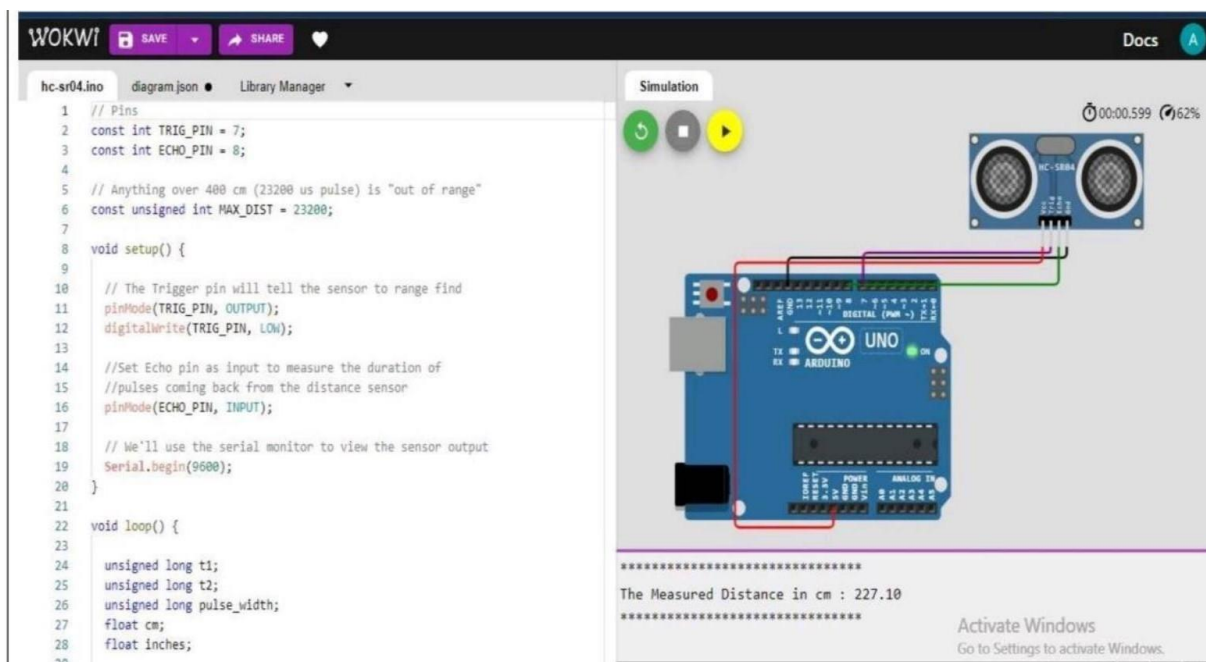
```

Output:

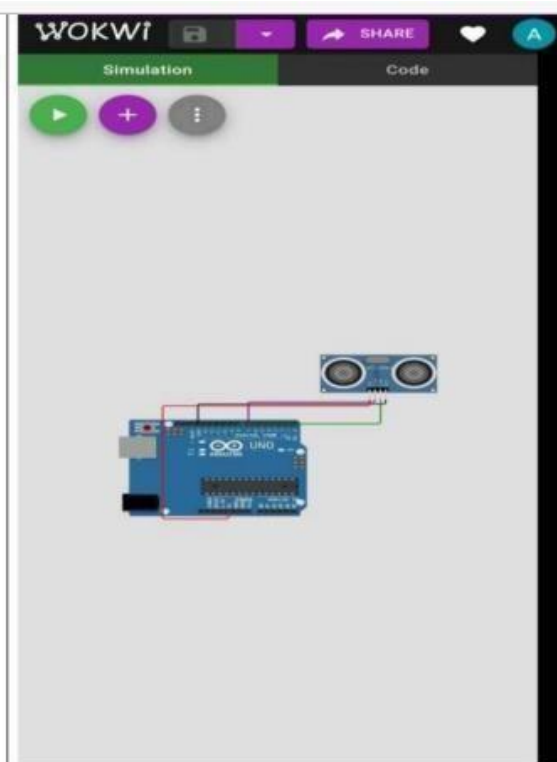
1.If the distance is less than 100 cms ,it alerts.



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



3.Simulation and code execution



The recent events listed show the live stream of data that is coming and going from this device.

Event	Value	Format	Last Received
event_1	"distance":7,"Alert":"Distance less than 10"	json	a few seconds ago
event_1	"distance":9,"Alert":"Distance less than 10"	json	a few seconds ago
event_1	"distance":8,"Alert":"Distance less than 10"	json	a few seconds ago
event_1	"distance":9,"Alert":"Distance less than 10"	json	a few seconds ago

Event	Value	Format	Last Received
event_1	["distance":7,"Alert":"Distance less than 10"]	json	a few seconds ago
event_1	["distance":9,"Alert":"Distance less than 10"]	json	a few seconds ago
event_1	["distance":8,"Alert":"Distance less than 10"]	json	a few seconds ago
event_1	["distance":9,"Alert":"Distance less than 10"]	json	a few seconds ago