1.Write Code and connections in wokwi for ultrasonic sensor. whatever distance is less than 100 cms send "Alert" to ibm cloud aand 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);

}
```
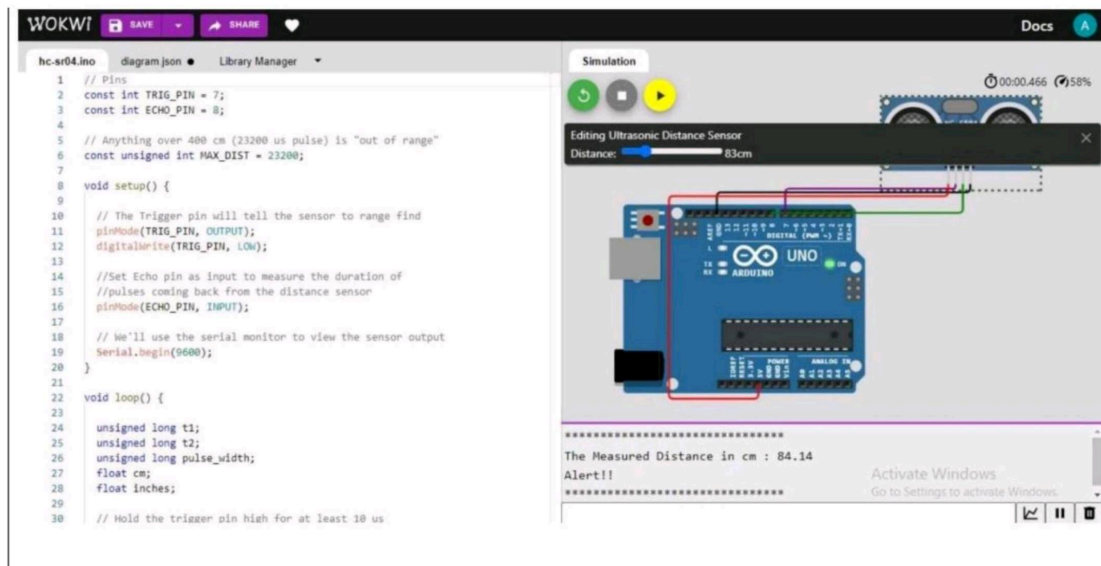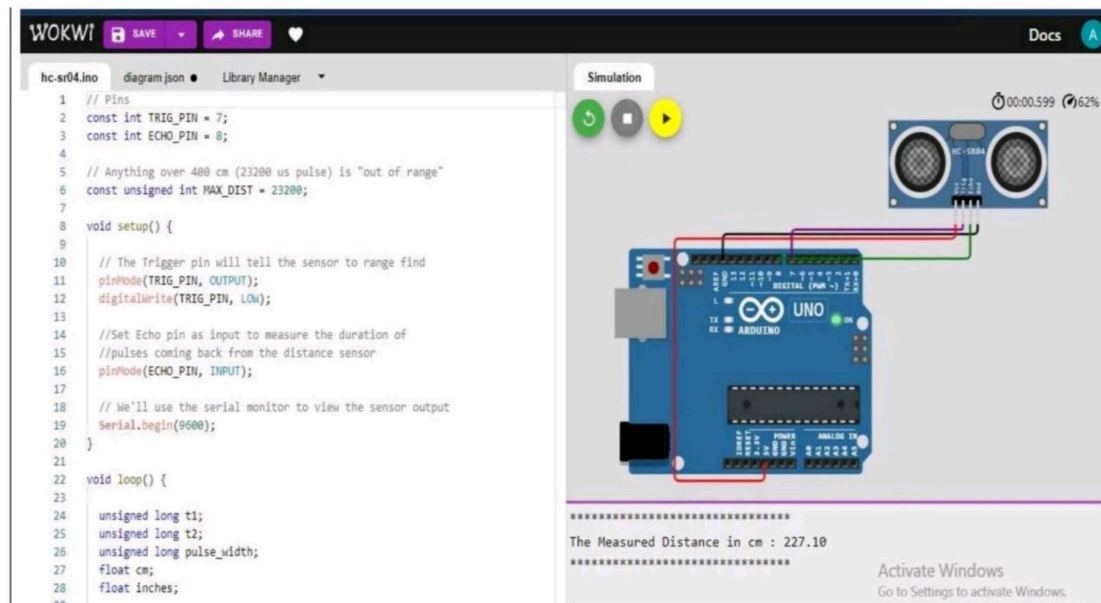
Output:

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

Editing Ultrasonic Distance Sensor
Distance: 199cm

****
The Measured Distance in cm : 201.79
****

****
The Measured Distance in cm : 57.79
Alert it !!
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