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.

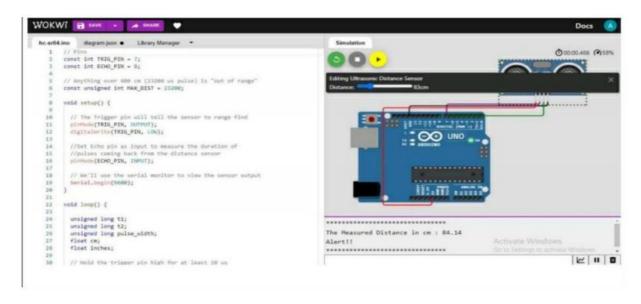
```
Solution:
//Pins
const int TRIG_PIN = 7;
const int ECHO_PIN = 8;
//Anything over 400 cm (23200 us pulse) is "out of range"
const unsigned int MAX_DIST = 23200;
void setup() {
// The Trigger pin will tell the sensor to range find
Pin Mode(TRIG_PIN, OUTPUT);
digital Write(TRIG_PIN, LOW);
//Set Echo 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 cms ,it alerts.



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

```
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                                                                                           Simulation
    1 // Pins
                                                                                                                                                              Q00:00:599 (962%
     2 const int TRIG_PIN = 7;
     3 const int ECHO PIN = 8;
    5 // Anything over 400 cm (23200 us pulse) is "out of range"
    6 const unsigned int MAX_DIST - 23280;
    B void setup() {
          // The Irigger pin will tell the sensor to runge find
pinvode(TRIG_PIN, CMTPUT);
digitalerite(TRIG_PIN, LCM);
   11
                                                                                                                    OO UNO .
          //Set Echo pin as input to measure the duration of 
//pulses coming back from the distance sensor
   14
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17
          pinFlode(ECHO_PIN, INPUT);
           // We'll use the serial monitor to view the sensor output
   19 20 }
          Serial.begin(9600);
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   22
23
       yoid loop() {
          unsigned long ti;
          unsigned long t2;
unsigned long pulse_width;
                                                                                        The Measured Distance in cm : 227.10
                                                                                        Activate Windows
         float inches;
                                                                                                                                           Go to Settings to activate Windows.
```

## 3. Simulation and code execution

