Assignment- 4

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1. Write Code and connections in wokwi for ultrasonic sensor. whatever distance is less than 100 cm send "Alert" to IBM cloud and display in device recent events.

Solution:

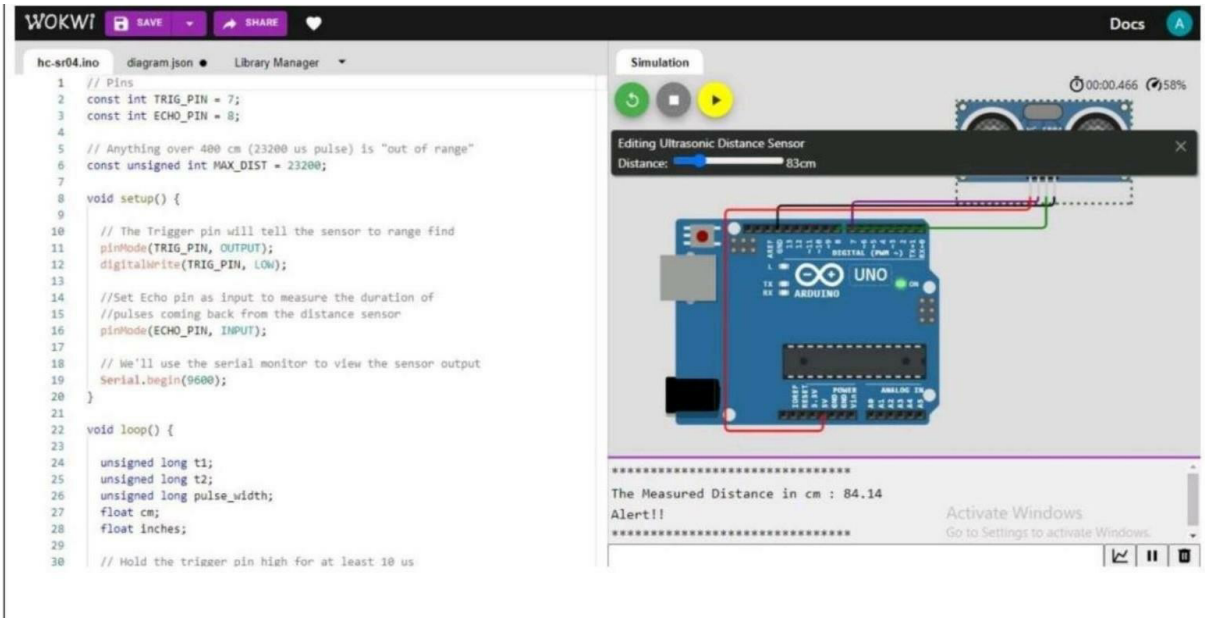
```
//Pins
const int TRIG_PIN = 7; const int
ECHO_PIN = 8;

//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
```

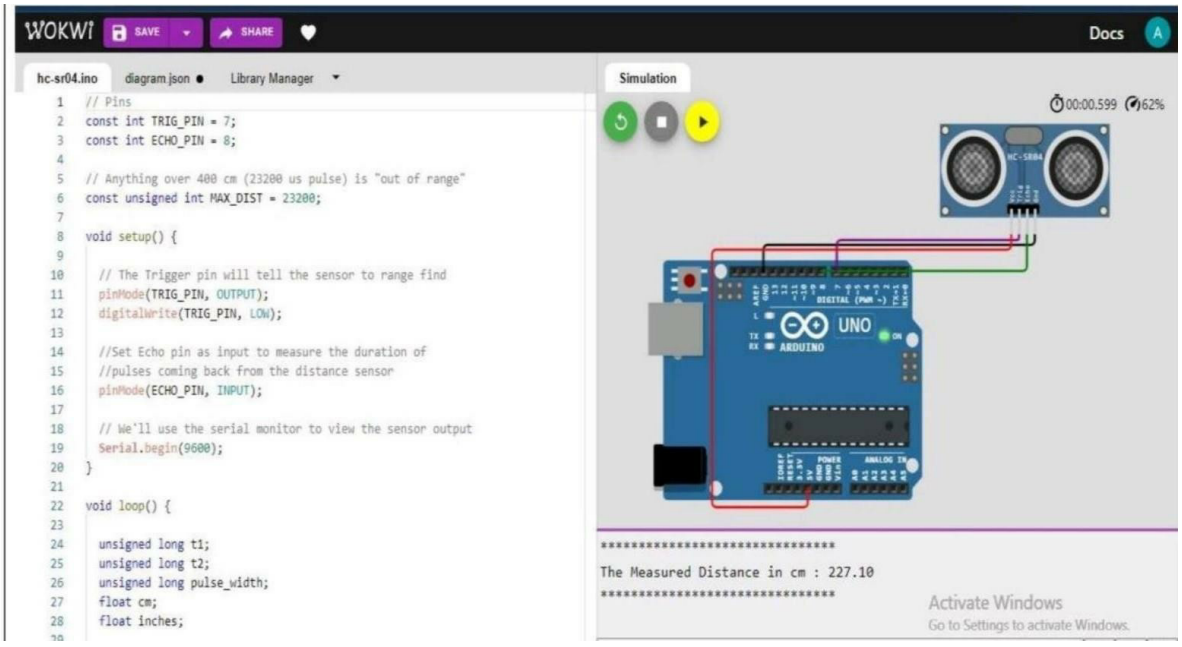
```
 //are found in the datasheet, and calculated from the assumed speed
 // of sound in air at sea level (~ 340m/s)
 cm=pulse_Width / 58;
 inches= pulse_width/148.0;
// Print out results
 if (pulse_width>MAX_ DIST
 ){ Serial.println("Out of range");
 } else{
 Serial.println("*************************"); 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 cm, it alerts



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



3. Simulation and code execution