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);
```
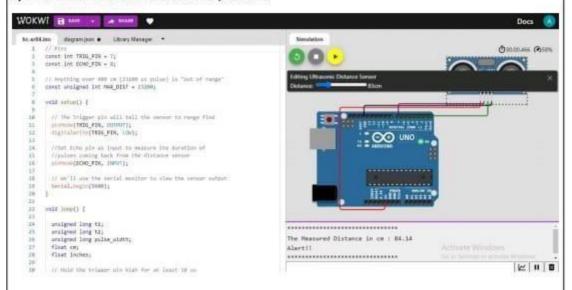
```arduino
  // We'll use the serial monitor to view the sensor output
  Serial.begin(9600);
  }


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;
```
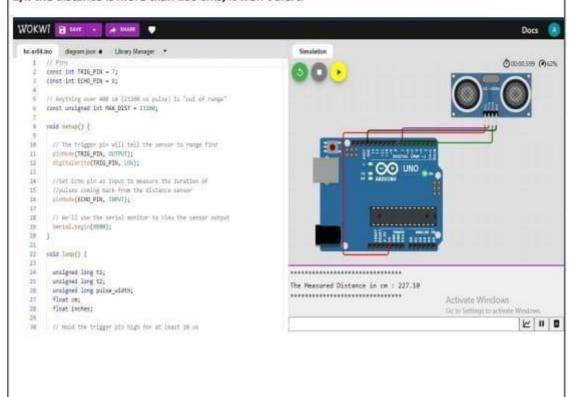
```
  // Calculate distance in centimeters and inches. The constants // are found in
the datasheet, and calculated from the assumed speed  //of sound in air at sea
level (~340 m/s).  cm = pulse_width / 58.0;  inches = pulse_width / 148.0;
 // Print out results if (
pulse_width > MAX_DIST ) {
Serial.println("Out of range");
 } else {
Serial.println("*****************************");
Serial.print("The Measured Distance in cm : ");
Serial.println(cm); if(cm<100){
  // while(true){
  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 !!
********************************
```