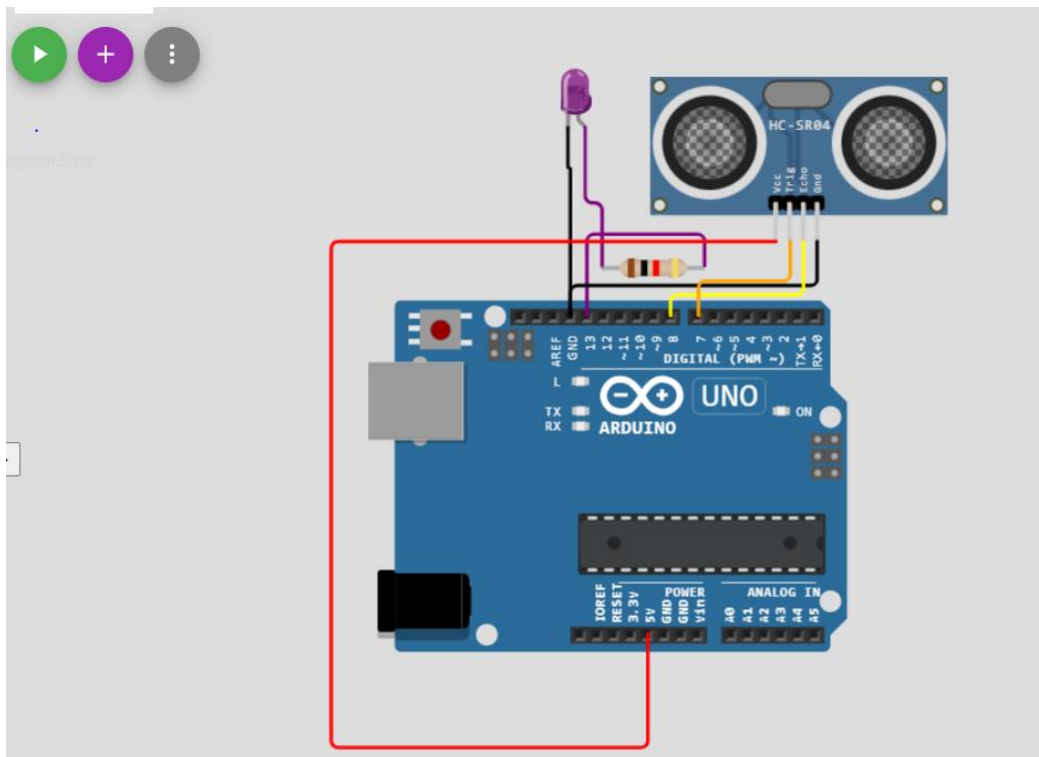# ASSIGNMENT – 4

TEAM ID : PNT2022TMID22485

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.

CIRCUIT:

1.Distance is less than 100 cm- **"ALERT"**

sketch.ino   diagram.json   Library Manager ▼   Simulation

```
 2   const int TRIG_PIN = 7;
 3   const int ECHO_PIN = 8;
 4   //anything over 400cm(23200 us pulse)is "out of range"
 5   const unsigned int MAX_DIST = 23200;
 6   void setup() {
 7   //The Trigger pin will tell the sensor to range find
 8   pinMode(TRIG_PIN, OUTPUT);
 9   digitalWrite(TRIG_PIN, LOW);
10   pinMode(LED_BUILTIN, OUTPUT);
11   //Set Echo pin as input to measure the duration of pulse coming back from
12   //distance sensor
13   pinMode(ECHO_PIN, INPUT);
14   //We'll use the serial monitor to view the sensor output
15   Serial.begin(9600);
16   }
17   void loop() {
18   unsigned long t1;
19   unsigned long t2;
20   unsigned long pulse_width;
21   float cm;
22   float inches;
23   bool near = cm <100;
24
25   //Hold the trigger pin high for at least 10us
26   digitalWrite(TRIG_PIN, HIGH);
27   delayMicroseconds(10);
28   digitalWrite(TRIG_PIN, LOW);
29   //wait for pulse on echo pin
30   while (digitalRead(ECHO_PIN) == 0);
31   //Measure how long the echo pin was held high (pulse width)
32   //note the micros()counter will overflow after -70min
33   t1 = micros();
34   while (digitalRead(ECHO_PIN) == 1);
35   t2 = micros();
```
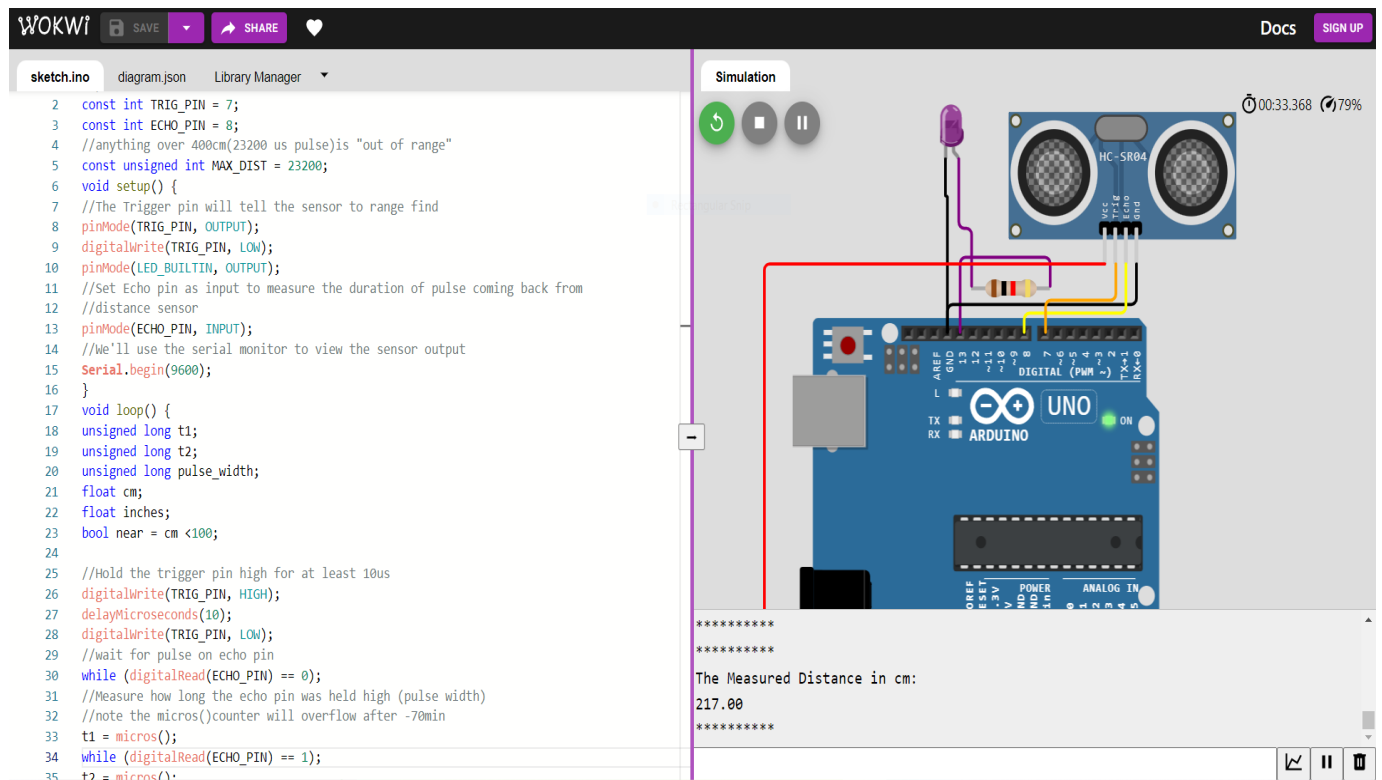
```
**********
The Measured Distance in cm:
97.00
Alert!
**********
```

2. Distance more than 100 - **"ALERT NOT SHOWN"**

Wokwi link :-

https://wokwi.com/projects/346738956583305810

CODE:

```
//pins

const int TRIG_PIN = 7;

const int ECHO_PIN = 8;

//anything over 400cm(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);

pinMode(LED_BUILTIN, OUTPUT);
```

```
//Set Echo pin as input to measure the duration of pulse coming back from
//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;
bool near = cm <100;


//Hold the trigger pin high for at least 10us
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 -70min
t1 = micros();
while (digitalRead(ECHO_PIN) == 1);
t2 = micros();
pulse_width = t2 - t1;
//calculate distance in centimeters and inches. The constantsare found in
//datasheet,and calculated from the assumed speed of sound in air at sea level(-340m/s)
```

```arduino
cm = pulse_width / 58;

inches = pulse_width / 148.0;

//print out results

if (pulse_width > MAX_DIST) {

Serial.println("Out of range");

digitalWrite(LED_BUILTIN,LOW);

}

else

{

Serial.println("**********");

Serial. println("The Measured Distance in cm:");

Serial.println(cm);

digitalWrite(LED_BUILTIN,LOW);

if (cm < 100)

{

//while (true)

{

Serial.println("Alert!");

digitalWrite(LED_BUILTIN,near);

}

}

Serial.println("**********");

}

//wait at least 1000ms before next measurement

delay(1000);

}
```