

# ASSIGNMENT-4

## DISTANCE DETECTION USING ULTRASONIC SENSOR

Date	24 October 2022
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### 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.

### Wokwi Link:

<https://wokwi.com/projects/348389389622051411>

### Code:

```
#define TRIG_PIN 21
#define ECHO_PIN 19
#define LED_PIN 5
#define DISTANCE_THRESHOLD 100

float duration_us, distance_cm;

void setup() {
  Serial.begin(9600);
  pinMode(TRIG_PIN, OUTPUT);
  pinMode(ECHO_PIN, INPUT);
  pinMode(LED_PIN, OUTPUT);
}

void loop() {

  digitalWrite(TRIG_PIN, HIGH);
  delayMicroseconds(10);
  digitalWrite(TRIG_PIN, LOW);
```

```

duration_us = pulseIn(ECHO_PIN, HIGH);

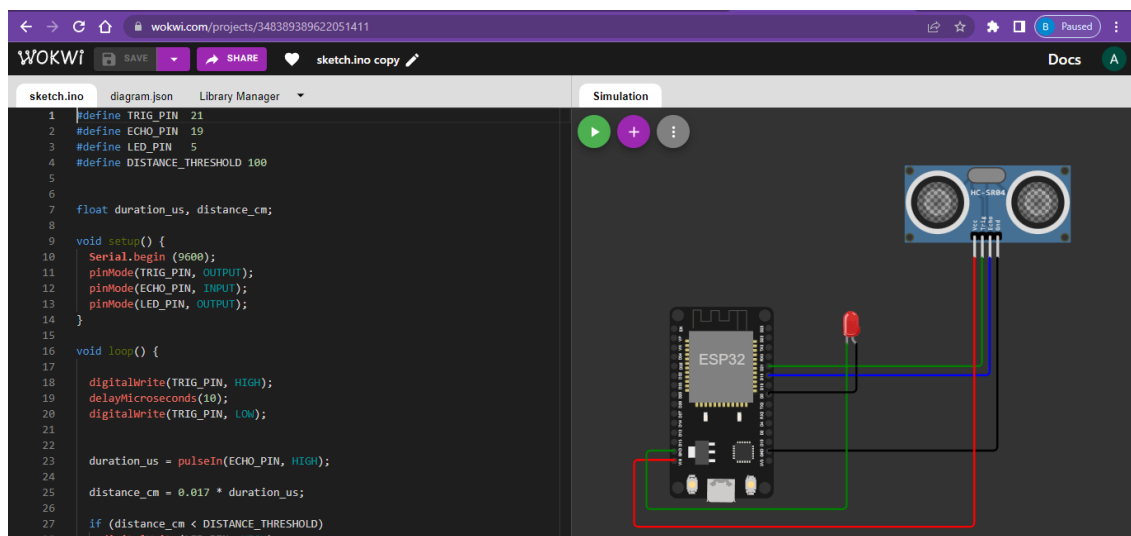
distance_cm = 0.017 * duration_us;

if (distance_cm < DISTANCE_THRESHOLD)
    digitalWrite(LED_PIN, HIGH);
else
    digitalWrite(LED_PIN, LOW);

Serial.print("distance: ");
Serial.print(distance_cm);
Serial.println(" cm");

delay(500);
}

```



## Data send to the IBM cloud device when the object is far

The screenshot shows the IBM Cloud IoT Platform console for a device named DESVMSDETECT. The device is in a 'Disconnected' state. The 'Recent Events' tab is selected, displaying a table of five data events. Each event is a JSON object with 'distance' and 'object' fields, both set to 'far'. The events are listed in descending order of time, with the most recent at the top. The table has columns for Event, Value, Format, and Last Received.

Event	Value	Format	Last Received
Data	{"distance":343.21,"object":"far"}	json	a few seconds ago
Data	{"distance":343.21,"object":"far"}	json	a few seconds ago
Data	{"distance":343.21,"object":"far"}	json	a few seconds ago
Data	{"distance":343.21,"object":"far"}	json	a few seconds ago
Data	{"distance":343.2,"object":"far"}	json	a few seconds ago

## Data sent to the IBM Cloud Device when the object is near

The screenshot shows the IBM Cloud IoT Platform console for the same device, DESVMSDETECT. The device is still in a 'Disconnected' state. The 'Recent Events' tab is selected, displaying a table of five data events. Each event is a JSON object with 'distance' and 'object' fields, both set to 'near'. The events are listed in descending order of time, with the most recent at the top. The table has columns for Event, Value, Format, and Last Received.

Event	Value	Format	Last Received
Data	{"distance":79.66,"object":"near"}	json	a few seconds ago
Data	{"distance":79.64,"object":"near"}	json	a few seconds ago
Data	{"distance":79.66,"object":"near"}	json	a few seconds ago
Data	{"distance":79.64,"object":"near"}	json	a few seconds ago
Data	{"distance":79.66,"object":"near"}	json	a few seconds ago