ASSIGNMENT-4

DISTANCE DETECTION USING ULTRASONIC SENSOR

Date	04.11 2022
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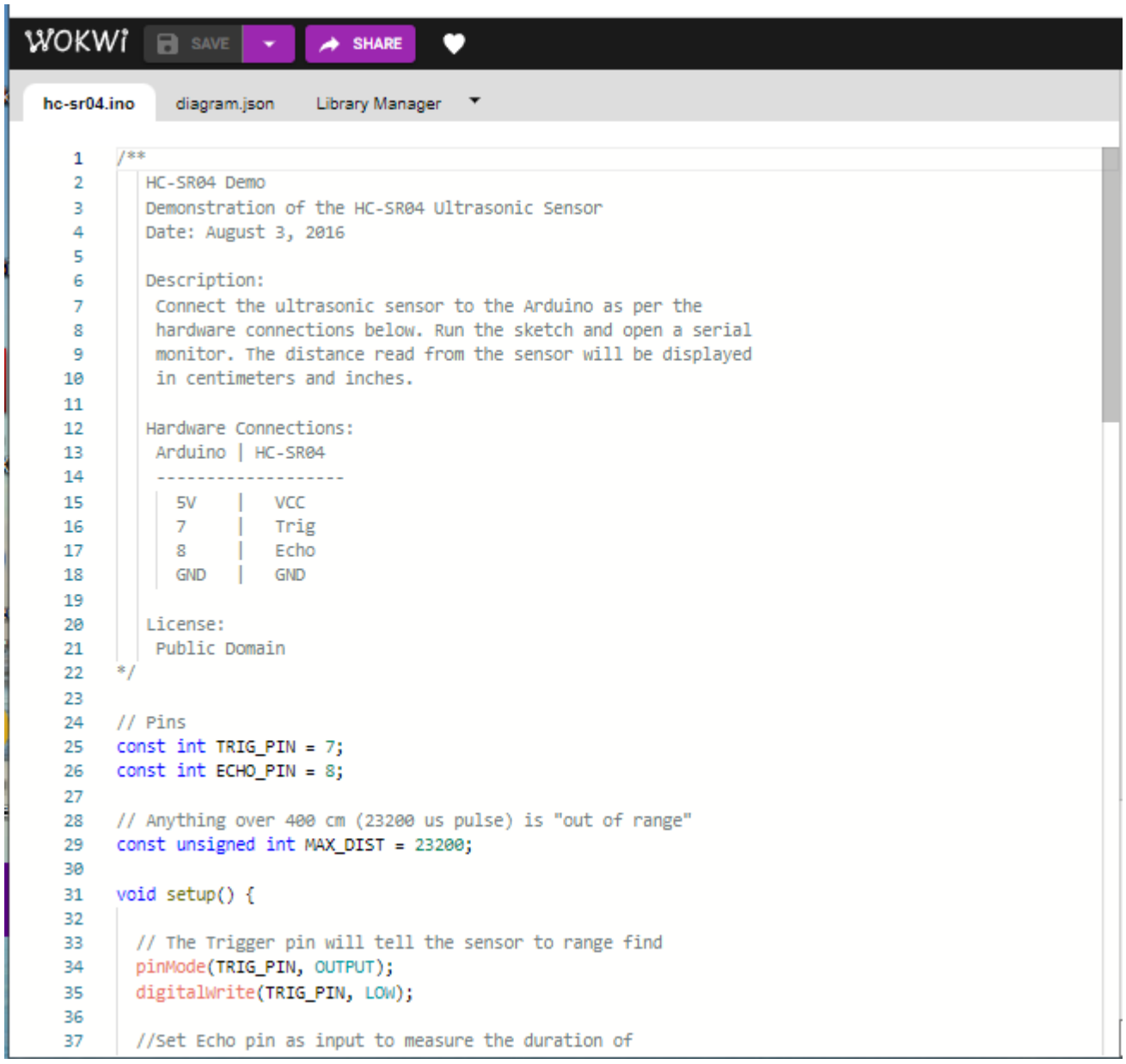
Mark	2Marks

Question1 :

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/290962720810861064**

CODE:



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hc-sr04.ino | diagram.json | Library Manager

```
/**
 HC-SR04 Demo
 Demonstration of the HC-SR04 Ultrasonic Sensor
 Date: August 3, 2016

 Description:
  Connect the ultrasonic sensor to the Arduino as per the
  hardware connections below. Run the sketch and open a serial
  monitor. The distance read from the sensor will be displayed
  in centimeters and inches.

 Hardware Connections:
  Arduino | HC-SR04
  -------------------
    5V    |   VCC
    7     |   Trig
    8     |   Echo
    GND   |   GND

 License:
  Public Domain
*/

// 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
```

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```
  //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;

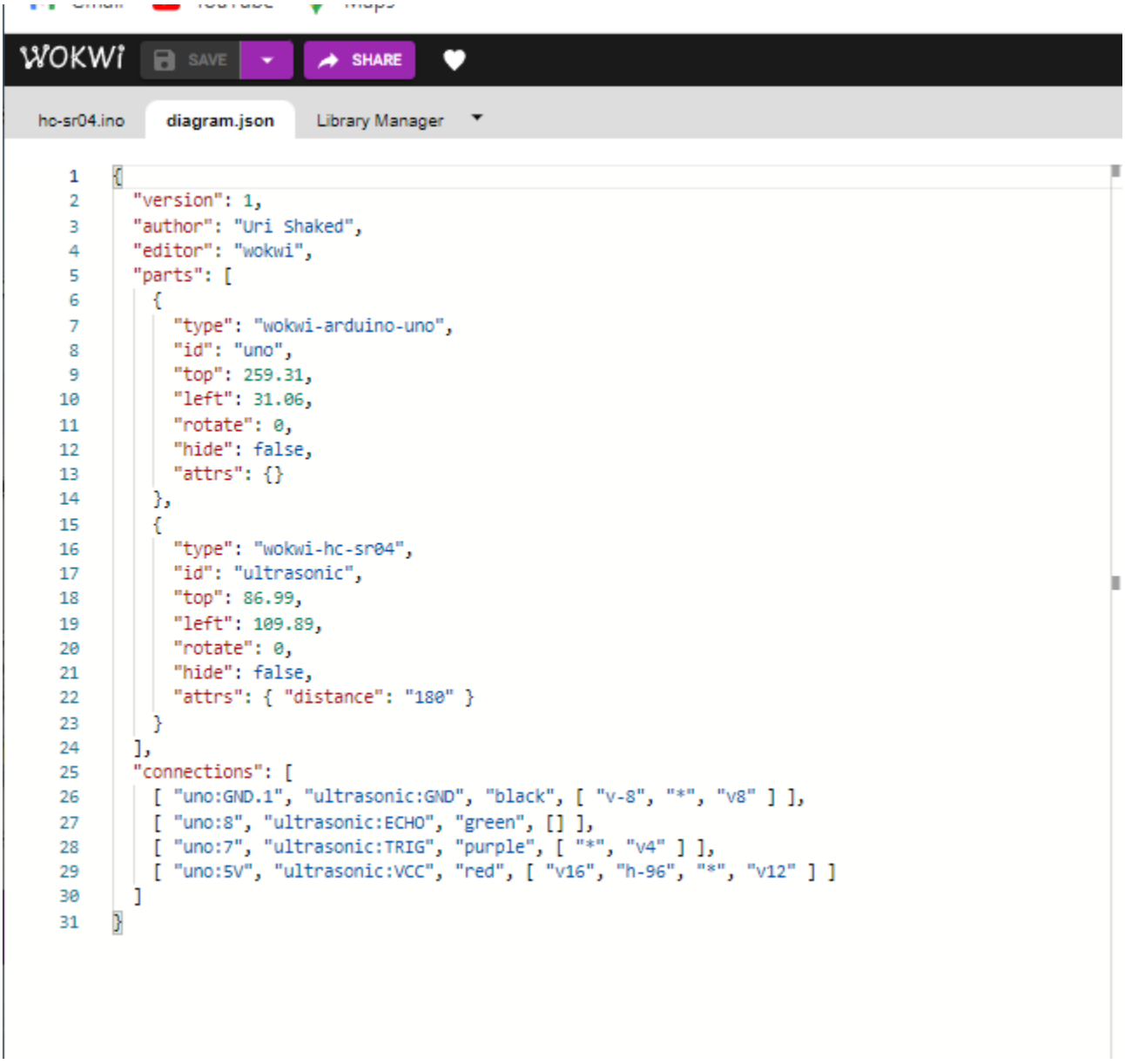
  // Hold the trigger pin high for at least 10 us
  digitalWrite(TRIG_PIN, HIGH);
  delayMicroseconds(10);
  digitalWrite(TRIG_PIN, LOW);

  // 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 (~340 m/s).
  cm = pulse_width / 58.0;
  inches = pulse_width / 148.0;

```

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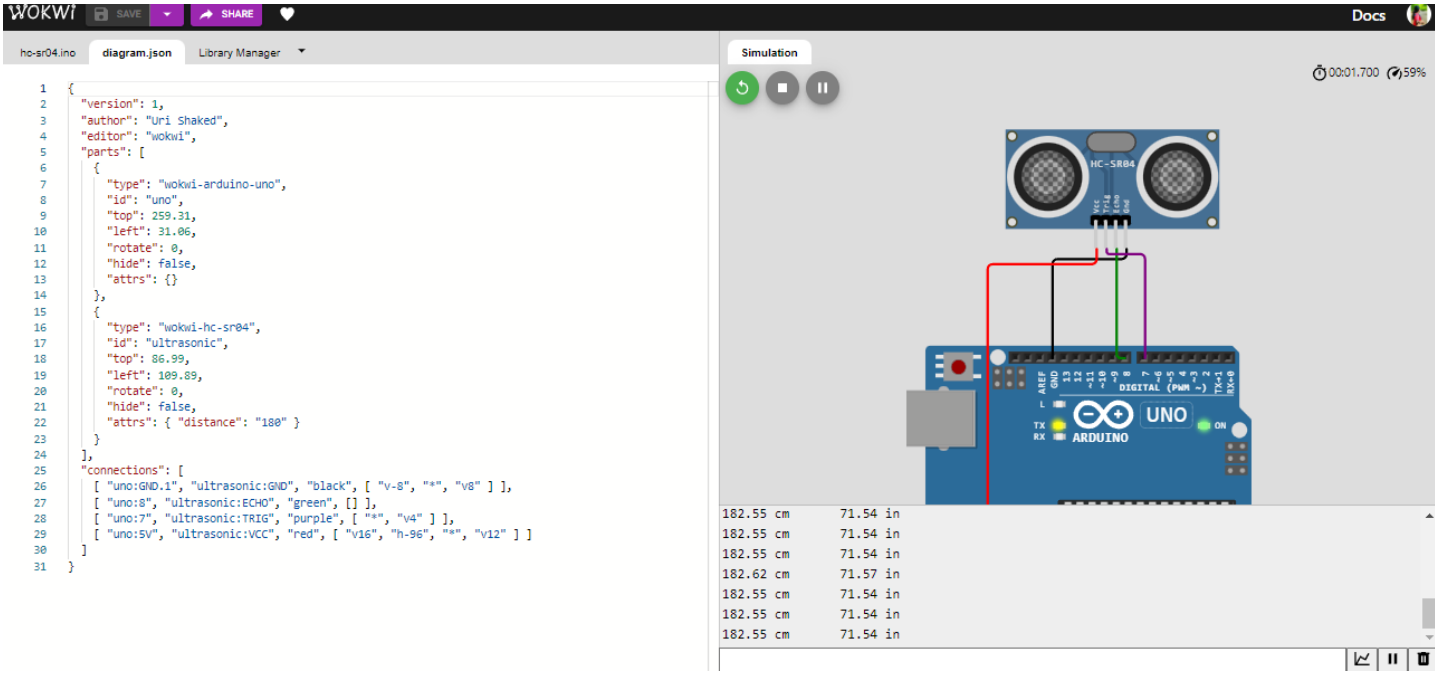
    [ "uno:8", "ultrasonic:ECHO", "green", [] ],
    [ "uno:7", "ultrasonic:TRIG", "purple", [ "*", "v4" ] ],
    [ "uno:5V", "ultrasonic:VCC", "red", [ "v16", "h-96", "*", "v12" ] ]
  ]
}
```

OUTPUT:




```
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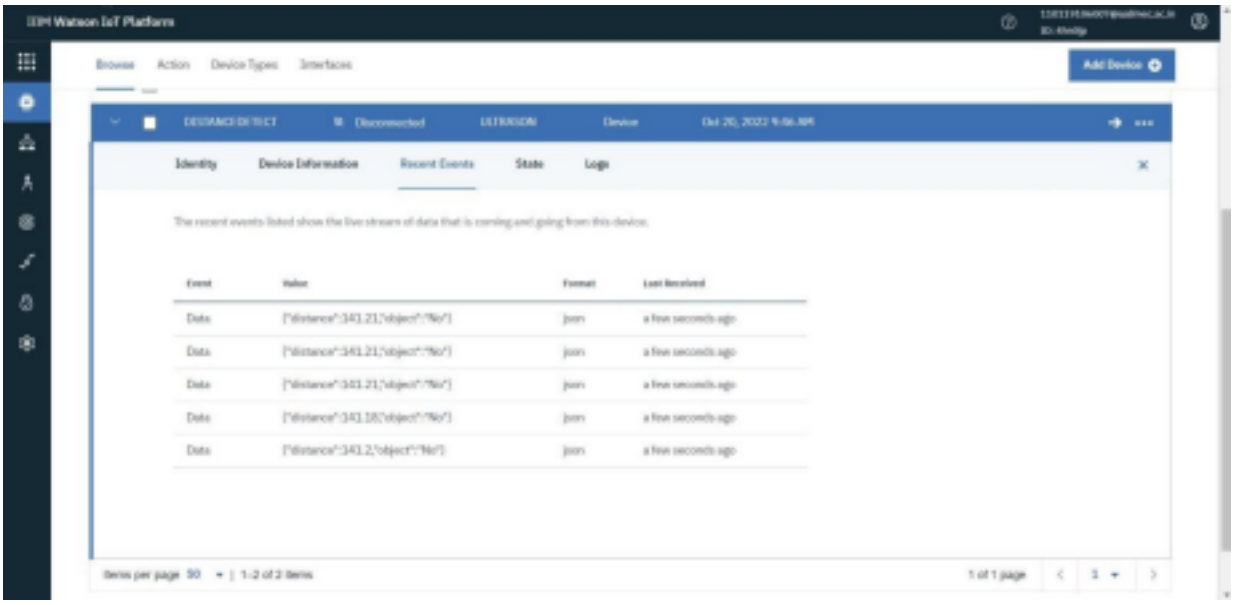
  ]
}
```

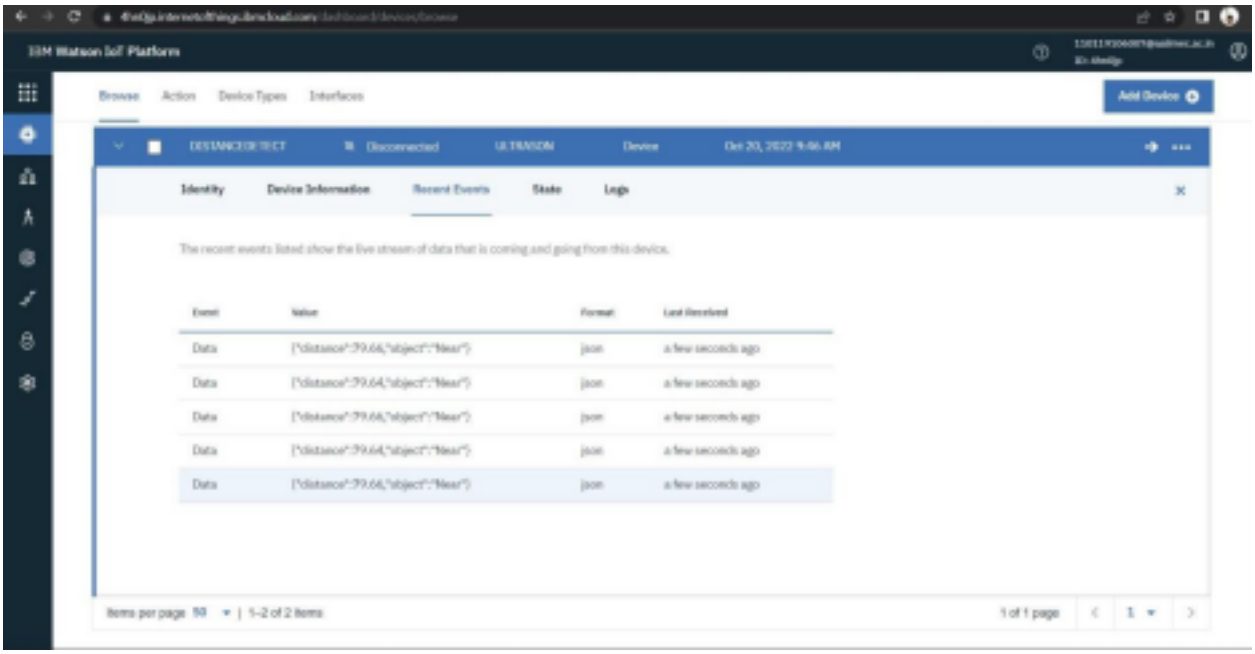
Data send to the IBM cloud device when the object is far



when object is near to the ultrasonic sensor

when object is near to the ultrasonic sensor

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


IBM Watson IoT Platform
Browse
Action
Device Types
Interfaces
Add Device
Disconnected
ULTRASON
Device
Identity
Device Information
Recent Events
State
Logs
The recent events listed show the live stream of data that is coming and going from this device.
Event
Value
Format
Last Received
Data
{"distance":39.64,"object":"Near"}
json
a few seconds ago
Items per page: 50
1–2 of 2 items
1 of 1 page