Assignment 4

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Write code and connections in wokwi for the ultrasonic sensor.

Whenever the distance is less than 100 cms send an "alert" to the IBM cloud.

ABOUT THIS PROJECT:

This is a simple alarm system made with help of buzzer, LED and an Ultrasonic sensor also known asProximity/Distance Sensor (HC-SR04). One can stop the buzzer by pressing the button.

Steps:

Connect the +5V and GND of Arduino NO to the breadboard.

For LED: Connect the cathode (Shorter pin of LED) to ground and the Anode (longer pin of LED) witha 330 or 220 ohm resistor. Connect the second pin of resistor with pin 6 of the Arduino as shows in schematics.

For Buzzer: Connect the Positive terminal with pin 8 of Arduino and negative terminal to GND.

For Ultrasonic Sensor: Connect the VCC and GND . Connect the Trigger pin to pin 12 and Echo pin topin 13 of Arduino.

The setup is now ready. Now load the code in Arduino IDE and then Upload it to Arduino. Check the Serial Monitor readings.

Tip: You can fix this alarm near the door. The maximum distance measured by it 4 meters. So modifythe code accordingly and keep it such that if anyone comes within 2 meters of the door, the buzzer should ring!

Code:

```
/* This simple project describes how to make an ultrasonic alarm system usingLED,

Ultasonic Sensor(HC-SR04) and a buzzer.*/


//Firstly the connections of ultrasonic Sensor.Connect +5v and GND normally and trigger pin to 12 &echo pin to 13.
```

```
#define trigPin 12

#define echoPin 13

Int Buzzer = 8; // Connect buzzer pin to 8Int

ledPin= 6;  //Connect Led pin to 6

Int duration, distance;//to measure the distance and time taken


Void setup(){

        Serial.begin(9600);

        //Define the output and input objects(devices)

        pinMode(trigPin, OUTPUT);

        pinMode(echoPin, INPUT);

        pinMode(Buzzer, OUTPUT);

        pinMode(ledPin, OUTPUT);

}


Void loop(){


    digitalWrite(trigPin, HIGH);

    delayMicroseconds(10);

    digitalWrite(trigPin, LOW); duration

    = pulseIn(echoPin, HIGH);distance =

    (duration/2) / 29.1;

    //when distance is greater than or equal to 200 OR less than or equal to 0,the buzzer and LED areoff

  If (distance >= 200 || distance <= 0)

  {

  Serial.println("no object detected");

  digitalWrite(Buzzer,LOW);

  digitalWrite(ledPin,LOW);

  }
```

```
Else {
    Serial.println("object detected \n");
    Serial.print("distance= ");
    Serial.print(distance);          //prints the distance if it is between the range 0 to 200
    Tone(Buzzer,400);                // play tone of 400Hz for 500 ms
    digitalWrite(ledPin,HIGH);
  }
}
```

Output: