Arduino - Ultrasonic Sensor - Piezo Buzzer

We are going to learn how to:

- If the object is close to ultrasonic sensor, make sound
- If the object is far from ultrasonic sensor, stop making sound
- If the object is close to ultrasonic sensor, make melody of song

Hardware Required

1 × Arduino UNO or Genuino UNO

1 × USB 2.0 cable type A/B

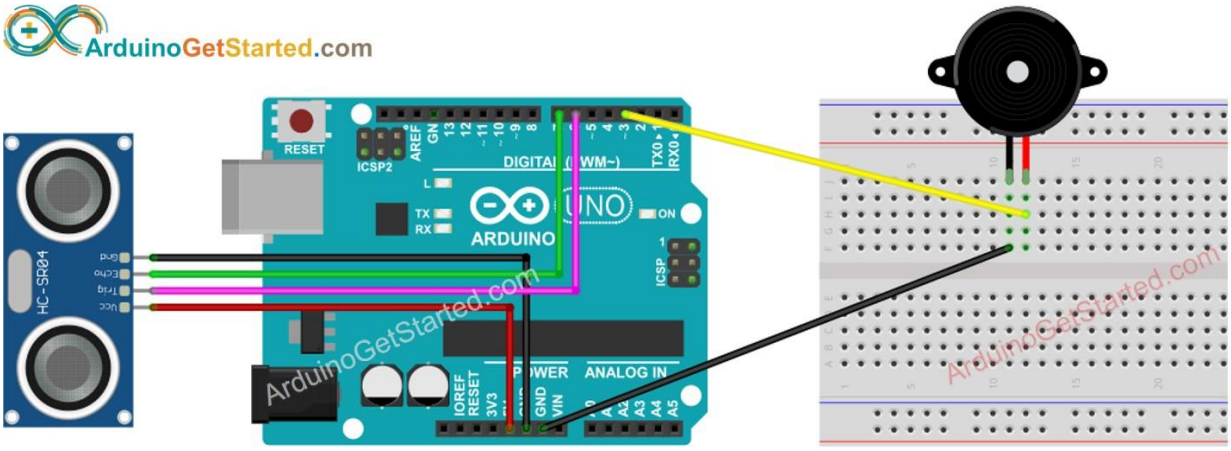
1 × Ultrasonic Sensor

1 × Piezo Buzzer

1 × Breadboard

n × Jumper Wires

Schematic:



Quick Steps

- Connect Arduino to PC via USB cable
- Open Arduino IDE, select the right board and port
- Copy the above code and open with Arduino IDE
- Click **Upload** button on Arduino IDE to upload code to Arduino
- Move your hand in front of sensor
- Listen to piezo buzzer's sound

Code Explanation

Read the line-by-line explanation in comment lines of source code!

Arduino Code - Simple Sound

```
/*
 * Created by ArduinoGetStarted.com
 *
 * This example code is in the public domain
 *
 * Tutorial page: https://arduinogetstarted.com/tutorials/arduino-ultrasonic-sensor-piezo-buzzer
 */

// constants won't change
const int TRIG_PIN   = 6; // Arduino pin connected to Ultrasonic Sensor's TRIG pin
const int ECHO_PIN   = 7; // Arduino pin connected to Ultrasonic Sensor's ECHO pin
const int BUZZER_PIN = 3; // Arduino pin connected to Piezo Buzzer's pin
const int DISTANCE_THRESHOLD = 50; // centimeters

// variables will change:
float duration_us, distance_cm;

void setup() {
```

```
  Serial.begin (9600);        // initialize serial port
  pinMode(TRIG_PIN, OUTPUT);   // set arduino pin to output mode
  pinMode(ECHO_PIN, INPUT);    // set arduino pin to input mode
  pinMode(BUZZER_PIN, OUTPUT); // set arduino pin to output mode
}

void loop() {
  // generate 10-microsecond pulse to TRIG pin
  digitalWrite(TRIG_PIN, HIGH);
  delayMicroseconds(10);
  digitalWrite(TRIG_PIN, LOW);

  // measure duration of pulse from ECHO pin
  duration_us = pulseIn(ECHO_PIN, HIGH);
  // calculate the distance
  distance_cm = 0.017 * duration_us;

  if(distance_cm < DISTANCE_THRESHOLD)
    digitalWrite(BUZZER_PIN, HIGH); // turn on Piezo Buzzer
  else
    digitalWrite(BUZZER_PIN, LOW);  // turn off Piezo Buzzer

  // print the value to Serial Monitor
  Serial.print("distance: ");
  Serial.print(distance_cm);
  Serial.println(" cm");

  delay(500);
}
```