

PANIMALAR ENGINEERING COLLEGE

Department of Electronics and Communication Engineering IOT Assignment

Assignment -4

Python Programming

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Question:

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.

Code:

```
const int TRIG_PIN = 7;

const int ECHO_PIN = 8;

const unsigned int MAX_DIST = 5800;

void setup()

{

    pinMode(TRIG_PIN, OUTPUT);
    digitalWrite(TRIG_PIN, LOW);
    pinMode(ECHO_PIN, INPUT);
    Serial.begin(9600);
}

void loop()
{

    unsigned long t1;
    unsigned long t2;
    unsigned long pulse_width;
```

```

float cm;
float inches;
digitalWrite(TRIG_PIN,HIGH);
delayMicroseconds(10);
digitalWrite(TRIG_PIN, LOW);

while ( digitalRead(ECHO_PIN) == 0 );

t1 = micros();
while ( digitalRead(ECHO_PIN) == 1);

t2 = micros();
pulse_width = t2 - t1;
cm= pulse_width / 58.0;
inches = pulse_width / 148.0;

if ( pulse_width < MAX_DIST )
{
  Serial.println("Out of range");setup1();
  loop1();
}
else
{
  Serial.print(cm);
  Serial.print(" cm \t");
  Serial.print(inches);
  Serial.println(" in");
}

delay(60);
}

```

```

void setup1() { pinMode(10,
  OUTPUT); }
void loop1() {
  digitalWrite(10, HIGH);

  delay(500);

  digitalWrite(10, LOW);
  delay(500);
}

```

Output (Distance less than 100m):

WOKWI

SAVE SHARE

Docs SIGN UP

sketch.ino diagram.json Library Manager

```
1 const int TRIG_PIN = 7;
2 const int ECHO_PIN = 8;
3 const unsigned int MAX_DIST = 5800;
4 void setup() {
5   pinMode(TRIG_PIN, OUTPUT);
6   digitalWrite(TRIG_PIN, LOW);
7   pinMode(ECHO_PIN, INPUT);
8   Serial.begin(9600);
9 }
10 void loop() {
11   unsigned long t1;
12   unsigned long t2;
13   unsigned long pulse_width;
14   float cm;
15   float inches;
16   digitalWrite(TRIG_PIN, HIGH);
17   delayMicroseconds(10);
18   digitalWrite(TRIG_PIN, LOW);
19   while ( digitalRead(ECHO_PIN) == 0 );
20   t1 = micros();
21   while ( digitalRead(ECHO_PIN) == 1);
22   t2 = micros();
23   pulse_width = t2 - t1;
24   cm = pulse_width / 58.0;
25   inches = pulse_width / 148.0;
26   if ( pulse_width < MAX_DIST ) {
27     Serial.println("Out of range");
28     setup1();
29     loop1();
30   }
31   } else {
32     Serial.print(cm);
33     Serial.print(" cm \t");
34     Serial.print(inches);
35     Serial.println(" in");
```

Simulation

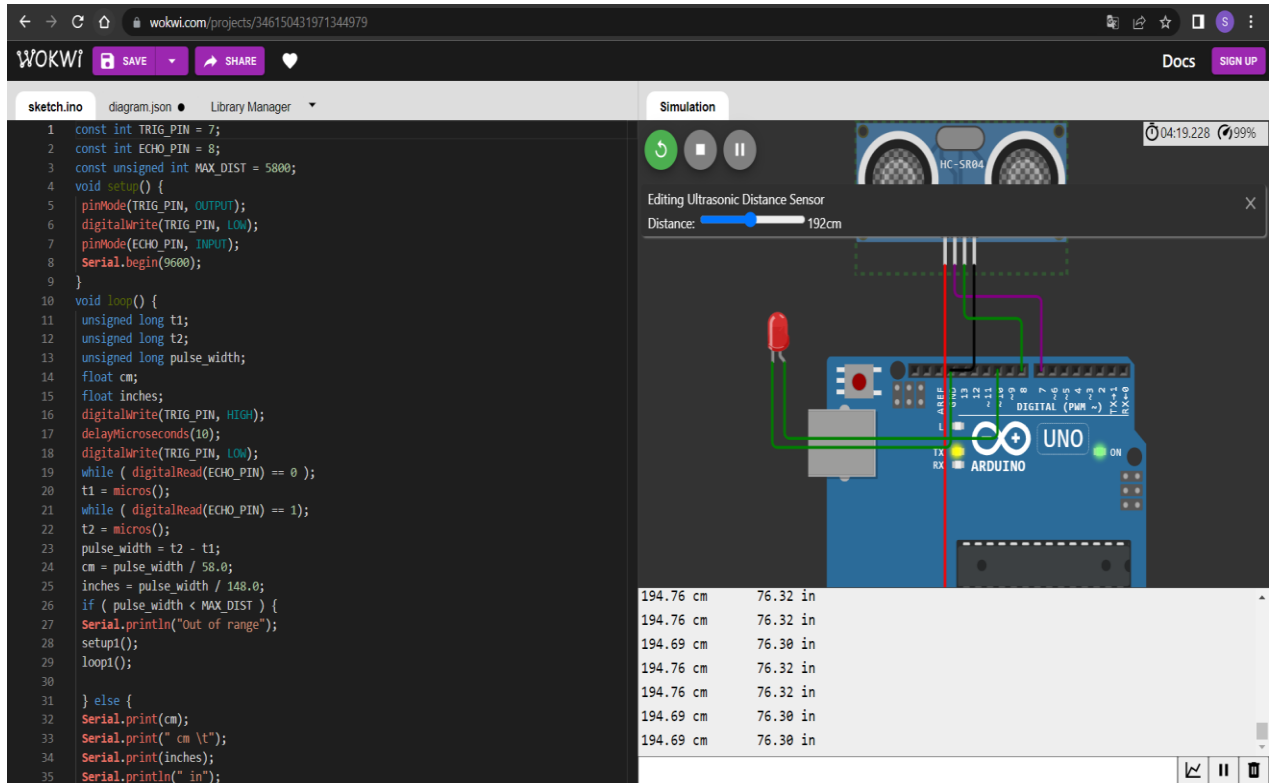
HC-SR04

Editing Ultrasonic Distance Sensor

Distance: 82cm

Out of range
Out of range
Out of range
Out of range
Out of range
Out of range
Out of range

Output (Distance greater than 100m):



The screenshot shows a Wokwi simulation environment. On the left, the 'sketch.ino' file contains the following code:

```
1 const int TRIG_PIN = 7;
2 const int ECHO_PIN = 8;
3 const unsigned int MAX_DIST = 5800;
4 void setup() {
5   pinMode(TRIG_PIN, OUTPUT);
6   digitalWrite(TRIG_PIN, LOW);
7   pinMode(ECHO_PIN, INPUT);
8   Serial.begin(9600);
9 }
10 void loop() {
11   unsigned long t1;
12   unsigned long t2;
13   unsigned long pulse_width;
14   float cm;
15   float inches;
16   digitalWrite(TRIG_PIN, HIGH);
17   delayMicroseconds(10);
18   digitalWrite(TRIG_PIN, LOW);
19   while ( digitalRead(ECHO_PIN) == 0 );
20   t1 = micros();
21   while ( digitalRead(ECHO_PIN) == 1);
22   t2 = micros();
23   pulse_width = t2 - t1;
24   cm = pulse_width / 58.0;
25   inches = pulse_width / 148.0;
26   if ( pulse_width < MAX_DIST ) {
27     Serial.println("Out of range");
28     setup();
29     loop();
30   } else {
31     Serial.print(cm);
32     Serial.print(" cm \t");
33     Serial.print(inches);
34     Serial.println(" in");
35   }
```

On the right, the 'Simulation' window shows an Arduino Uno connected to an HC-SR04 ultrasonic sensor. The sensor's distance is set to 192cm. Below the simulation, the serial monitor displays the following output:

194.76 cm	76.32 in
194.76 cm	76.32 in
194.69 cm	76.30 in
194.76 cm	76.32 in
194.76 cm	76.32 in
194.69 cm	76.30 in
194.69 cm	76.30 in

Wokwi link: <https://wokwi.com/projects/346150431971344979>