

Assignment - 04

Distance Measuring Alarm

Date	08 October 2022
Name	Hari R
Project Name	Smart Solution For Railways
Maximum Marks	2 Marks

Write a wokwi platform code to detect the object distance using ultrasonic distance sensor and ESP32.

Code:

```
const int trigPin = 5;
const int echoPin = 18;
//define sound speed in cm/uS
#define SOUND_SPEED 0.034
#define CM_TO_INCH 0.393701

long duration;
float distance;

void setup() {
  Serial.begin(115200); // Starts the serial communication
  pinMode(trigPin, OUTPUT); // Sets the trigPin as an Output
  pinMode(echoPin, INPUT); // Sets the echoPin as an Input
}

void loop() {
  // Clears the trigPin
  digitalWrite(trigPin, LOW);
  delayMicroseconds(2);
  // Sets the trigPin on HIGH state for 10 micro seconds
  digitalWrite(trigPin, HIGH);
  delayMicroseconds(10);
  digitalWrite(trigPin, LOW);
```

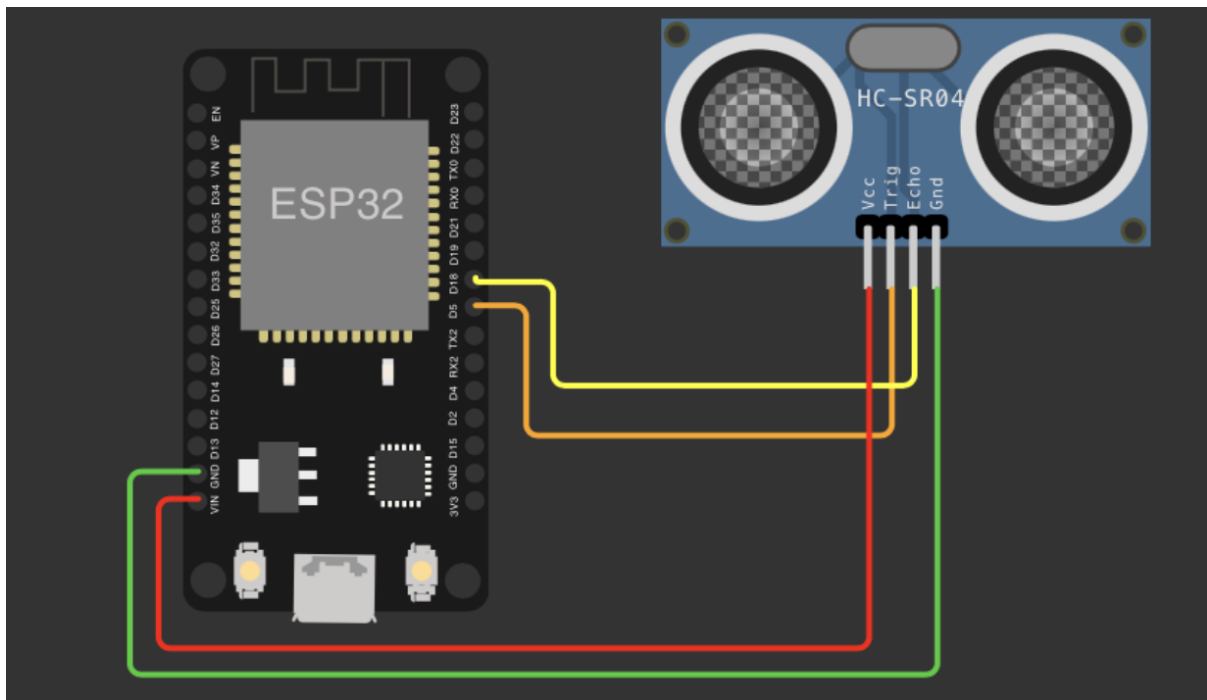
```

// Reads the echoPin, returns the sound wave travel time in microseconds
duration = pulseIn(echoPin, HIGH);
// Calculate the distance
distance = duration * SOUND_SPEED/2;
// Prints the distance in the Serial Monitor
Serial.print("Distance (cm): ");
Serial.println(distance);

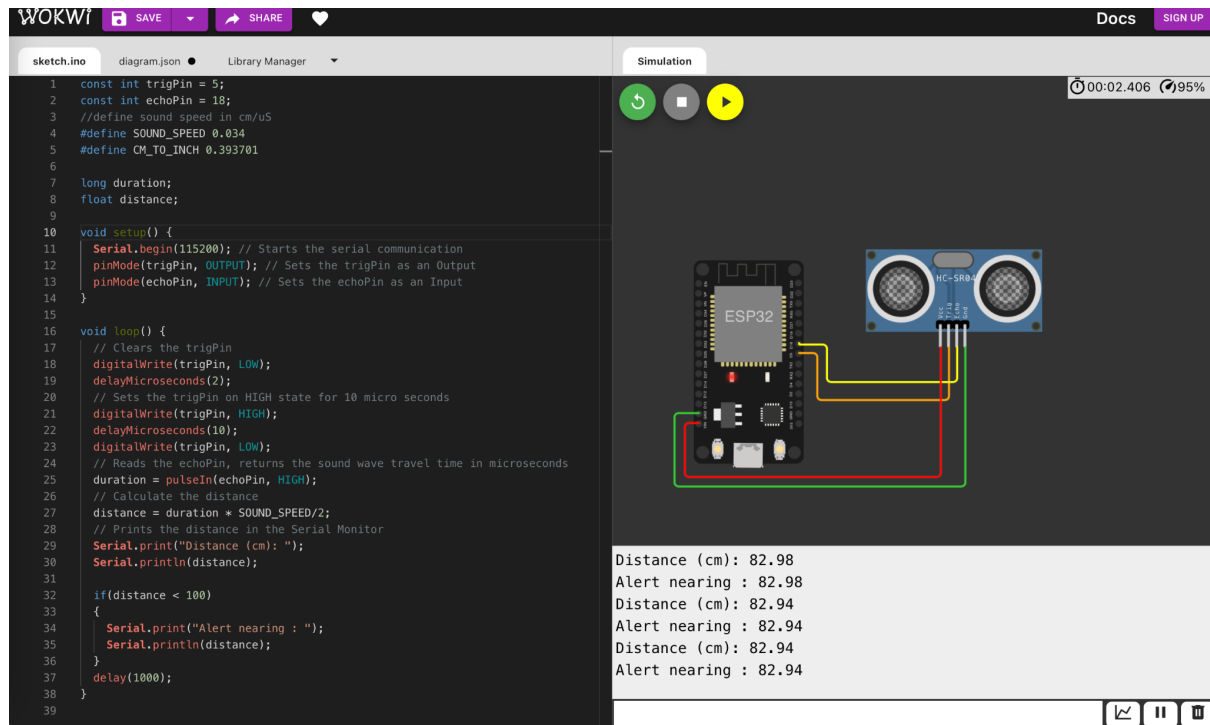
if(distance < 100)
{
    Serial.print("Alert nearing : ");
    Serial.println(distance);
}
delay(1000);
}

```

Circuit layout:



Output screen:



The screenshot displays the Wokwi IDE interface. On the left, the 'sketch.ino' file contains the following C++ code:

```
1  const int trigPin = 5;
2  const int echoPin = 18;
3  //define sound speed in cm/uS
4  #define SOUND_SPEED 0.034
5  #define CM_TO_INCH 0.393701
6
7  long duration;
8  float distance;
9
10 void setup() {
11   Serial.begin(115200); // Starts the serial communication
12   pinMode(trigPin, OUTPUT); // Sets the trigPin as an Output
13   pinMode(echoPin, INPUT); // Sets the echoPin as an Input
14 }
15
16 void loop() {
17   // Clears the trigPin
18   digitalWrite(trigPin, LOW);
19   delayMicroseconds(2);
20   // Sets the trigPin on HIGH state for 10 micro seconds
21   digitalWrite(trigPin, HIGH);
22   delayMicroseconds(10);
23   digitalWrite(trigPin, LOW);
24   // Reads the echoPin, returns the sound wave travel time in microseconds
25   duration = pulseIn(echoPin, HIGH);
26   // Calculate the distance
27   distance = duration * SOUND_SPEED/2;
28   // Prints the distance in the Serial Monitor
29   Serial.print("Distance (cm): ");
30   Serial.println(distance);
31
32   if(distance < 100)
33   {
34     Serial.print("Alert nearing : ");
35     Serial.println(distance);
36   }
37   delay(1000);
38 }
39
```

On the right, the 'Simulation' window shows a virtual circuit with an ESP32 microcontroller and an HC-SR04 ultrasonic sensor. Below the circuit, the serial monitor displays the following output:

```
Distance (cm): 82.98
Alert nearing : 82.98
Distance (cm): 82.94
Alert nearing : 82.94
Distance (cm): 82.94
Alert nearing : 82.94
```

Wokwi platform:

<https://wokwi.com/projects/346828654517420626>