

# Assignment -4

```
#include <stdio.h>
#include <stdbool.h>
#include <freertos/FreeRTOS.h>
#include <freertos/task.h>
#include <esp_err.h>
#include "ultrasonic.h"
#define ECHO_GPIO 12
#define TRIGGER_GPIO 13
#define MAX_DISTANCE_CM 500 // Maximum of 5 meters
void ultrasonic_test(void *pvParameters)
{
    float                distance;
    ultrasonic_sensor_t sensor = {
        .trigger_pin = TRIGGER_GPIO,
        .echo_pin = ECHO_GPIO
    };
    ultrasonic_init(&sensor);
    while (true) {
        esp_err_t res = ultrasonic_measure(&sensor, MAX_DISTANCE_CM, &distance);
        if (res == ESP_OK) {
            printf("Distance: %0.04f m\n", distance);
        } // Print error else
        {
            printf("Error %d: ", res); switch (res) {
                case
                ESP_ERR_ULTRASONIC_PING:
                    printf("Cannot ping (device is in invalid state)\n");
                    break; case
                ESP_ERR_ULTRASONIC_PING_TIMEOUT:
                    printf("Ping timeout (no device found)\n"); break;
                case
                ESP_ERR_ULTRASONIC_ECHO_TIMEOUT:
                    printf("Echo timeout (i.e. distance too
                    big)\n"); break; default:
                    printf("%s\n", esp_err_to_name(res));
            }
        }
        vTaskDelay(pdMS_TO_TICKS(500));
    }
}

void app_main()
```

```

{
xTaskCreate(ultrasonic_test, "ultrasonic_test", configMINIMAL_STACK_SIZE * 3,
NULL, 5, NULL);
}

```

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Ultrasonic\_sensor.ino diagram.json Library Manager

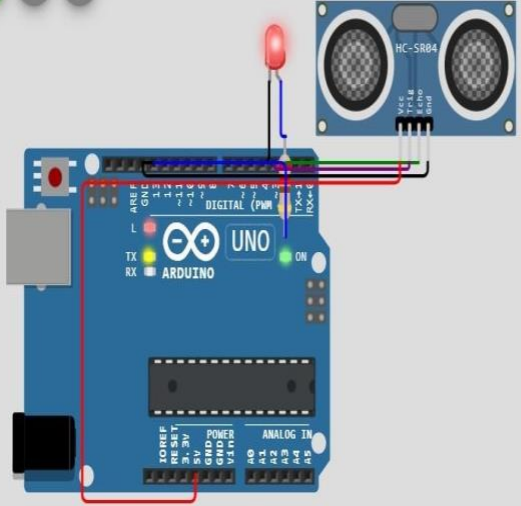
```

8
9 #define ECHO_PIN 2
10 #define TRIG_PIN 3
11
12 void setup() {
13   Serial.begin(115200);
14   pinMode(LED_BUILTIN, OUTPUT);
15   pinMode(TRIG_PIN, OUTPUT);
16   pinMode(ECHO_PIN, INPUT);
17 }
18
19 float readDistanceCM() {
20   digitalWrite(TRIG_PIN, LOW);
21   delayMicroseconds(2);
22   digitalWrite(TRIG_PIN, HIGH);
23   delayMicroseconds(10);
24   digitalWrite(TRIG_PIN, LOW);
25   int duration = pulseIn(ECHO_PIN, HIGH);
26   return duration * 0.034 / 2;
27 }
28
29 void loop() {
30   float distance = readDistanceCM();
31
32   bool isNearby = distance < 100;
33   digitalWrite(LED_BUILTIN, isNearby);
34
35   Serial.print("Measured distance: ");
36   Serial.println(readDistanceCM());
37
38   delay(100);
39 }
40

```

Simulation

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Measured distance: 96.68  
Measured distance: 96.68  
Measured distance: 96.76  
Measured distance: 96.76  
Measured distance: 96.66  
Measured distance: 96.68  
Measured distance: 96.68

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