

*Total duration
20 mins*

Ultra Sonic – Ping Test

Ultrasonic HC-SR04 Sensor Interfacing with ESP32



Overview



Ultrasonic HC-SR 04 Sensor

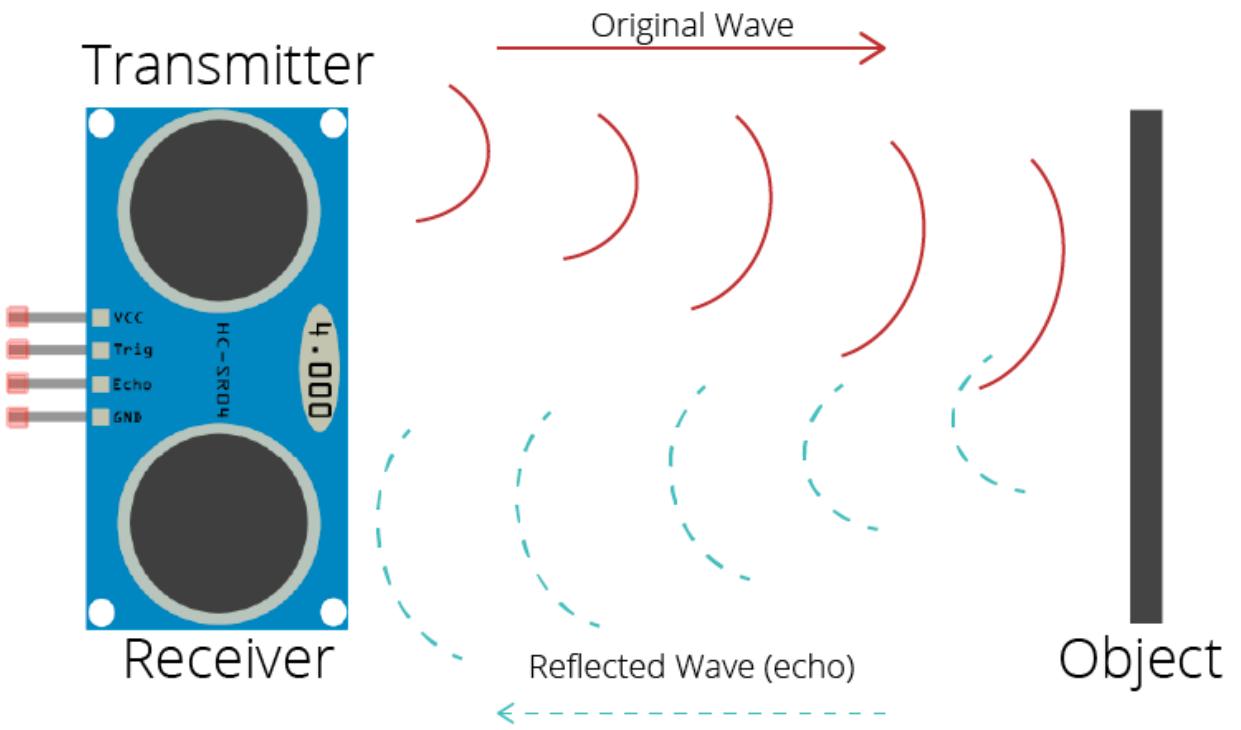
- Ultrasonic Module HC-SR04 works on the principle of SONAR and RADAR systems. It can be used to determine the distance of an object in the range of 2 cm – 400 cm.



How HC-SR04 Sensor Works?

An HC-SR04 ultrasonic distance sensor actually consists of two Ultrasonic Transducers.

- One acts as a transmitter that converts the electrical signal into 40 KHz ultrasonic sound pulses. The other acts as a receiver and listens for the transmitted pulses.
- When the receiver receives these pulses, it produces an output pulse whose width is proportional to the distance of the object in front.



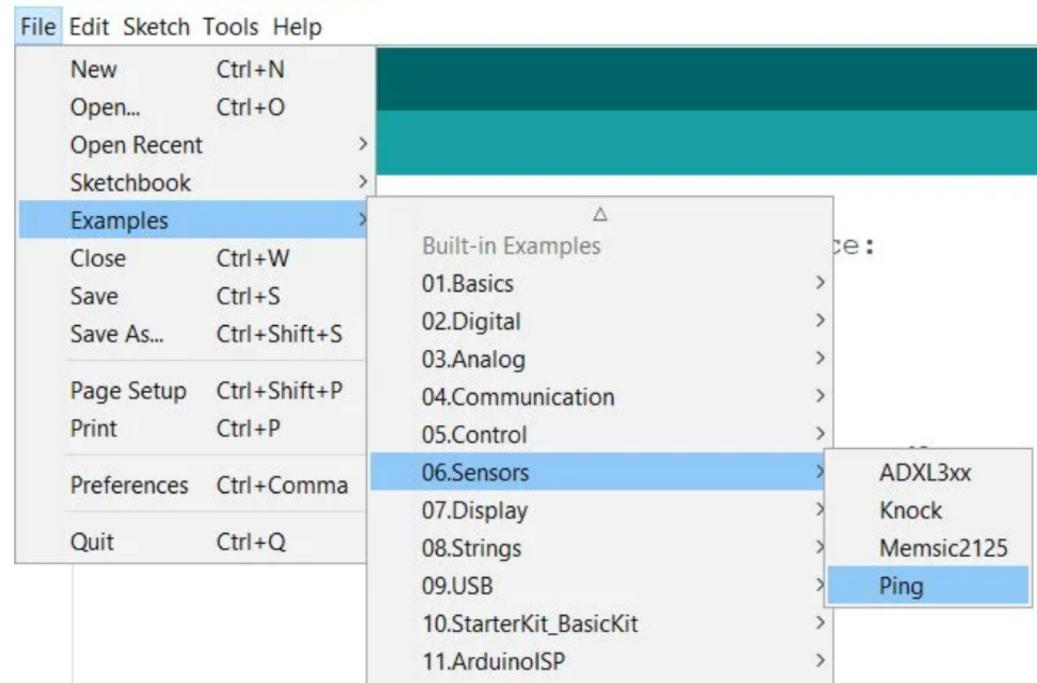
Ultrasonic HC-SR04 Sensor Interfacing with ESP32

Project Description: **Measuring Distance – Part I**

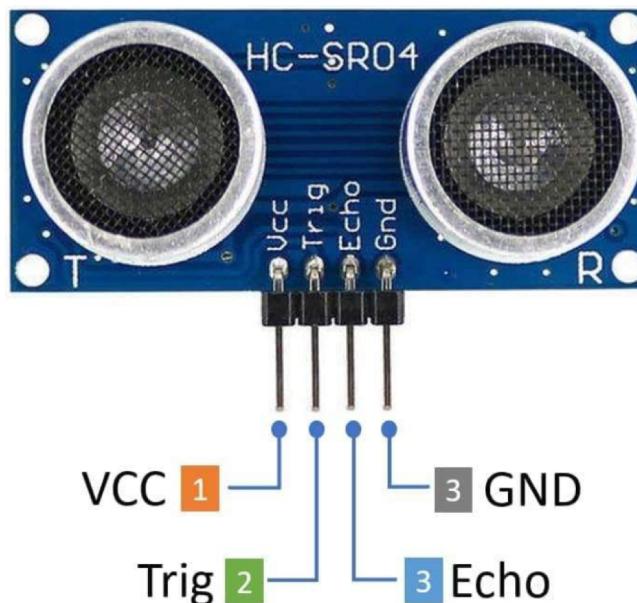


- Let us interface the Ultrasonic sensor to ESP32 and display the distance in Centimeter and Inch on the serial monitor.
- In this hands-on, we are using the Ping example that comes with Arduino IDE in the sensors library.

You can find this example
by following the direction
as shown in the image



HC-SR04 Ultrasonic Sensor Pinout



Pin description and specification:

- VCC: It operated on +5V DC
- GND: Connect to the ground
- Trig: Trigger as an input Pin
- Echo: Echo Pin as an output pin
- Working current: 15mA
- Ranging Distance: 2-400 cm
- Measuring Angle: 30°
- Trigger Input Pulse width: 10uS

Hardware Required



ESP32 Broad



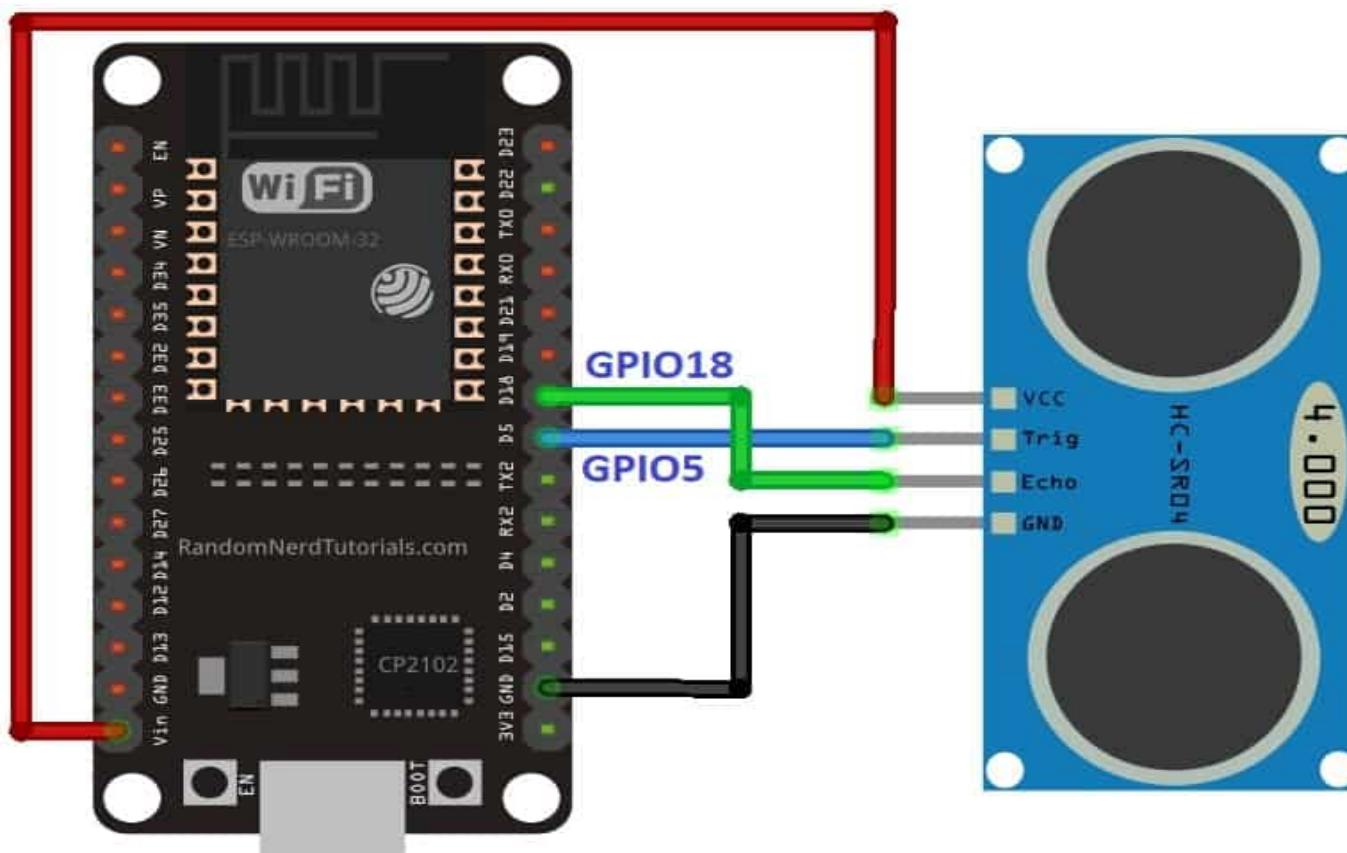
Micro USB Cable

Ultrasonic Sensor –HC-SR04



Jumper wires

Connection Diagram of HC-SR04 Ultrasonic Sensor with ESP32



Connection Diagram

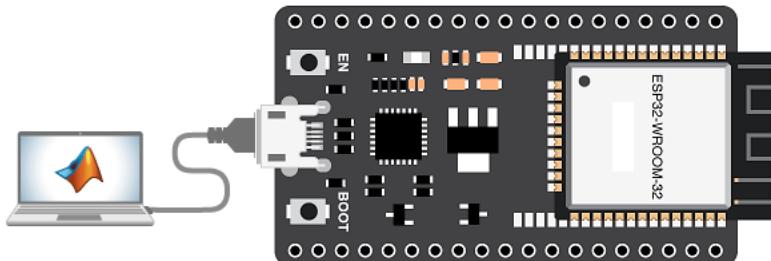
HC-SR04	ESP32
Vcc	V _{in}
GND	GND
Trigger	GPIO5
Echo	GPIO18

Connection Chart

Now, the follow the direction to complete assignment

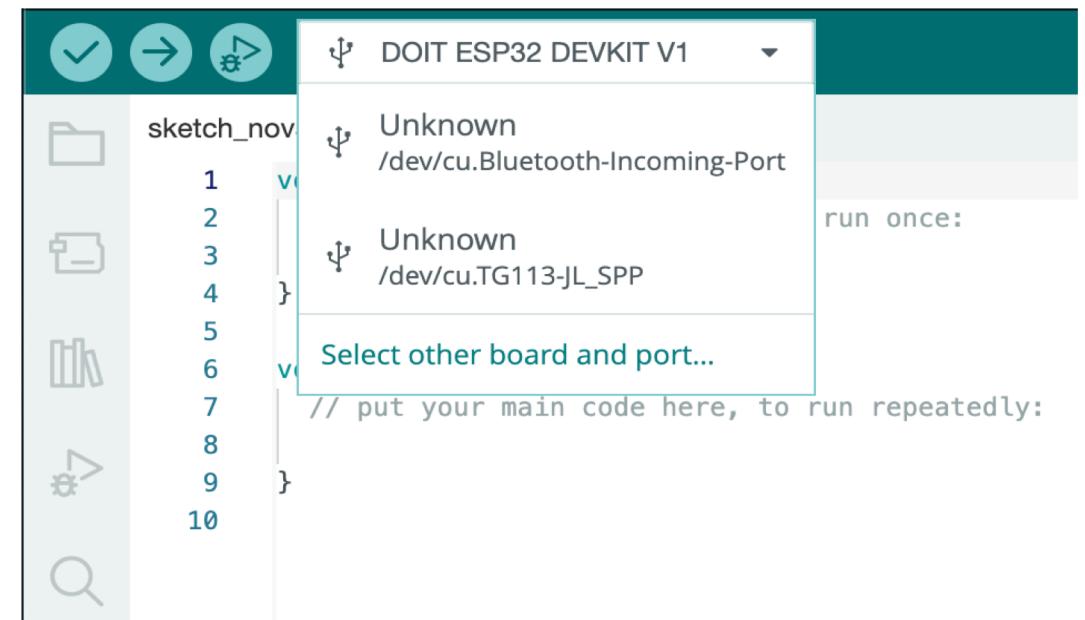
1

Connect ESP32 board with MicroUSB cable



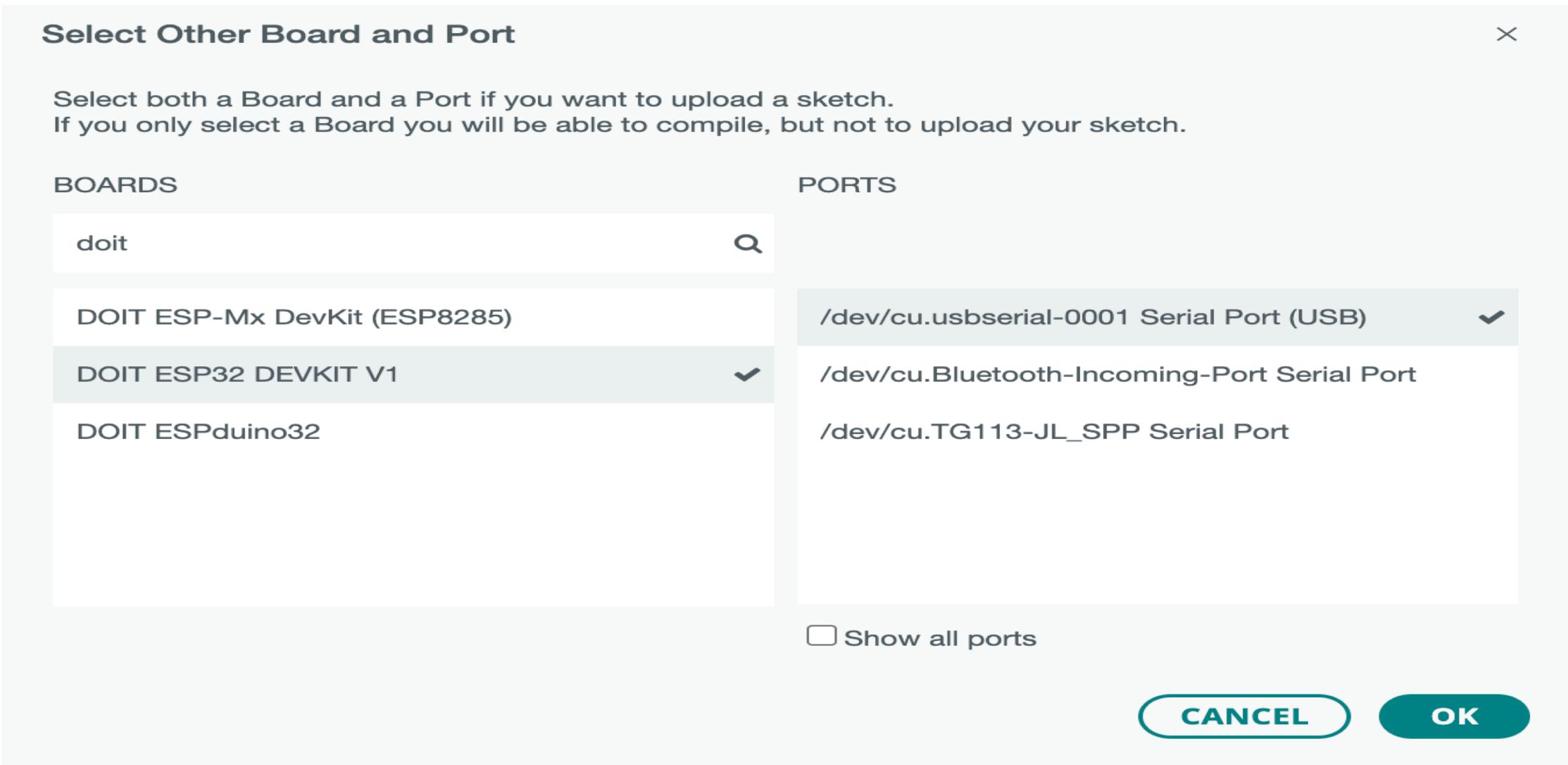
2

Open Arduino IDE and click “Select other board and port”



3

At the following screen type “DO IT ESP32 DEVKIT V1” under BOARDS and then select the USB port for communication



4

**Open Google Chrome browser type the following URL (Uniform Resource Locator)
<https://github.com/aetosgit/IOT> at the address bar**

5

Open “Ultrasonic_PingTest.in” sketch among the list the codes

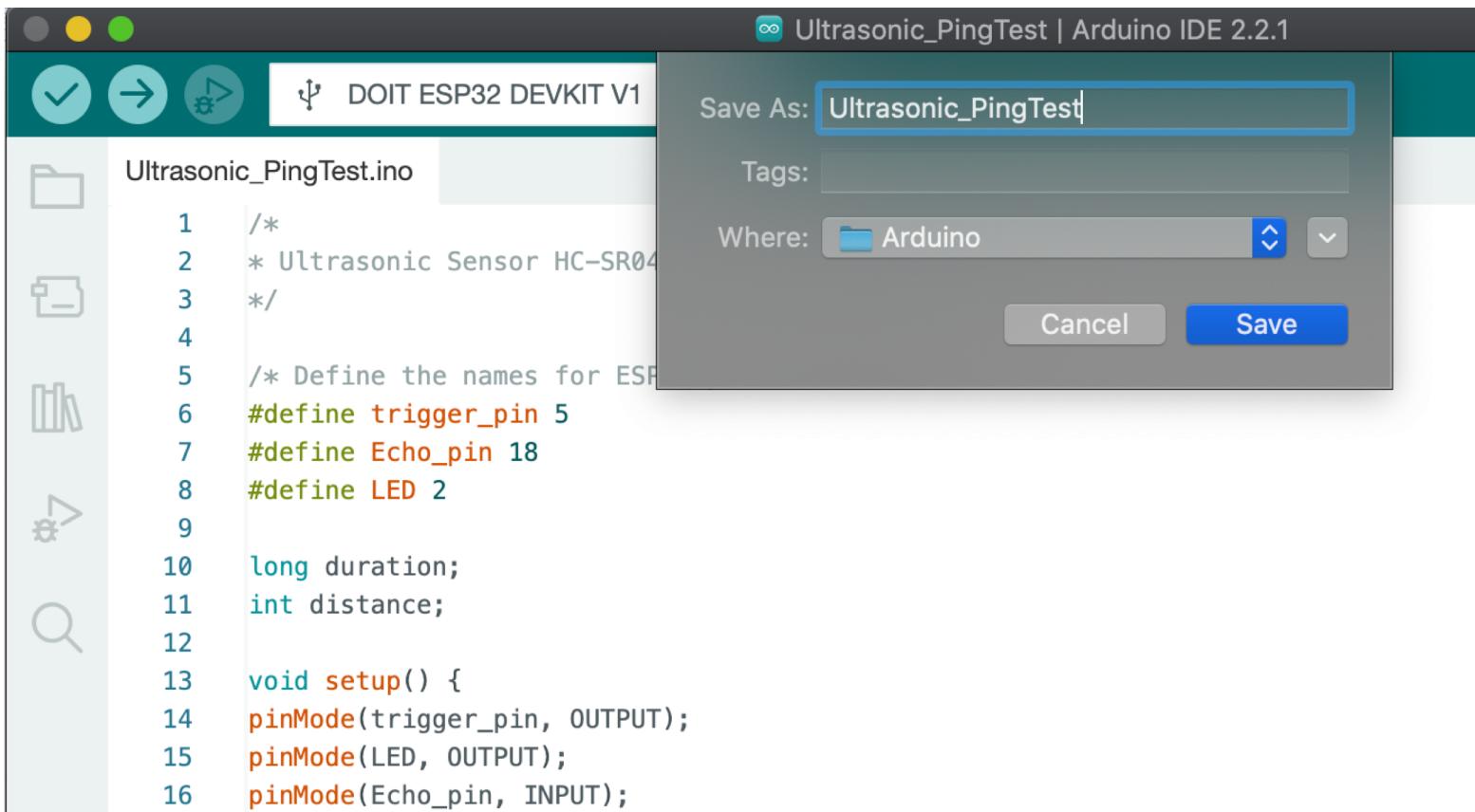
 ESP32-DHT-Webserver.ino	Add files via upload
 ESP32_Clock.ino	Add files via upload
 ESP32_DHT11_Basic.ino	Add files via upload
 INSTALLING_ESP32.docx	Add files via upload
 LED_WEB SERVER.ino	Add files via upload
 Offset_Time_IST.ino	Update Offset_Time_IST.ino
 README.md	Update README.md
 SG90_Stepper_Motor.ino	Add files via upload
 Setup_Webserver_ESP32_In...	Add files via upload
 Ultrasonic_PingTest.ino	Add files via upload

6

Copy “Ultrasonic_PingTest.ino” sketch

7

Paste sketch on to the new Arduino IDE and click *File -> Save as...* and then name as “Ultrasonic_PingTest”



8

Upload the sketch, while holding the “boot”

9

After successful upload (without any errors) click on “Serial Monitor”



10

After opening the Serial Monitor, now press “EN /Rest” button once view the output

Testing tips:

- *Move any object in front of the ultrasonic sensor, both forward and backward.*
- *Make sure to keep an eye on the Serial Monitor for the Output as you move the object.*
- *The object's movement's distance is shown in "Centimeter – CM."*
- *Additionally, if the object is closer than 15 cm, a blue LED alerts us.*

