About Project:

As The name of the project, this device can measure Height, width, length of any object without any physical touch. This device can measure Area and Volume also, so we can we can say this is an Dimension measurement device.

Required parts to implement "Area measurement of any object":

1. One Arduino Uno
2. Three Hc-SR04 Ultrasonic sensor
3. One 16x2 LCD Display
4. Jumper wire
5. Plastic board

Working Procedure of "Area Measurement":

When we put an object to the layout, then the sensor will read, sensor to upper side of every side of the object.

Suppose, the distance of sensor to length surface of object and wide surface of object respectively X and Y. So, we can measure the length and wide of the object by these formula:

Length= (200-X) cm

Wide= (100-Y) cm Let,

X=180 and Y=90

Then Length = 200-180 =20 cm

Wide = 100-90 = 10 cm

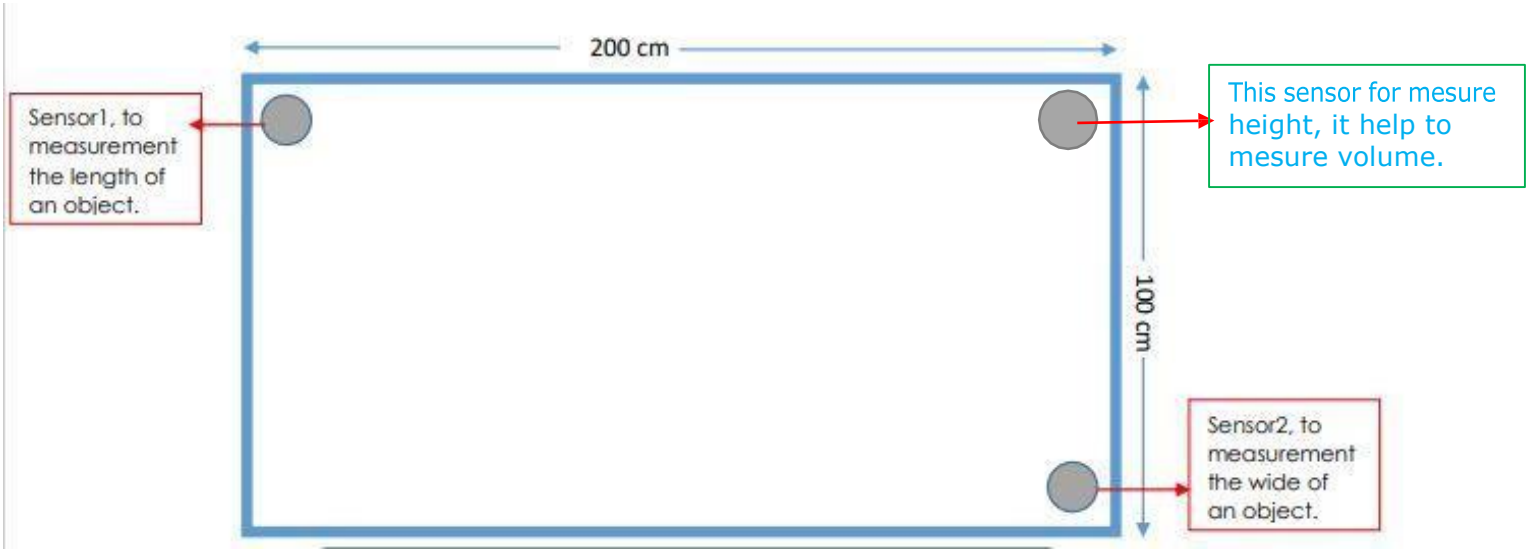
By Length and Wide we can measure Area: Area

= Length x Wide

= 20 cm x 10 cm

= 200 cm2

Before implement we design our Project by drawing:



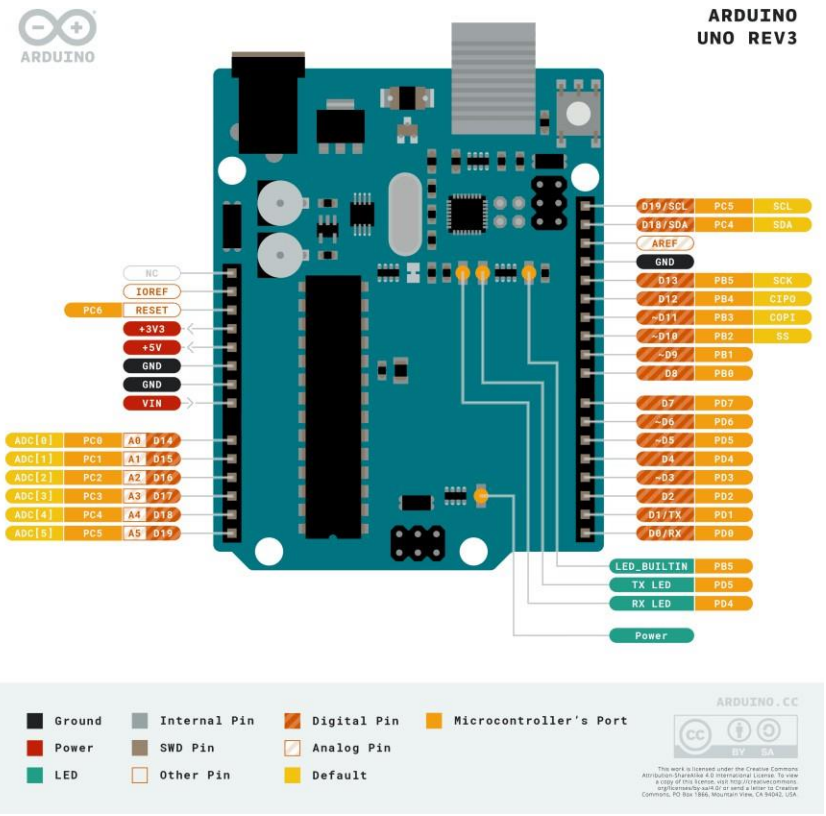
Our project was just area measurement, but we tried to measure height and volume also. Finally we did it by adding another sensor and some extra functions.

Required parts to implement this project:

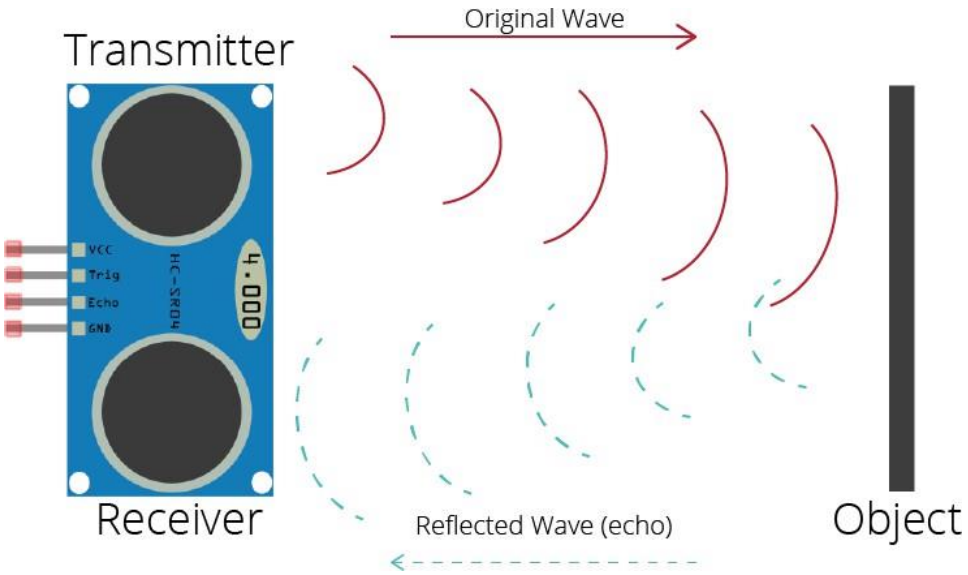
- At first we need A Arduino Uno:

The Arduino Uno is an open-source microcontroller board based on the Microchip ATmega328P microcontroller and developed by Arduino.cc and initially released in 2010. The word "uno" means "one" in Italian and was chosen to mark the initial release of Arduino Software.

Pin details of 'Arduino Uno' given below:

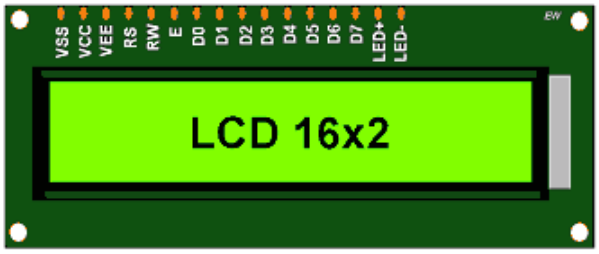


Details About HC-SR04 Ultrasonic sensor given below:



It's have 4 pin.one for VCC one For Ground and other two for Trigger and echo. Trigger transmit a wave to space if the wave reflect with any object, then the reflected wave will receive by receiver/Echo. By the process of wave motion, we can measure the distance of any object without touching. The Range of this Sensor is 2cm-450cm.

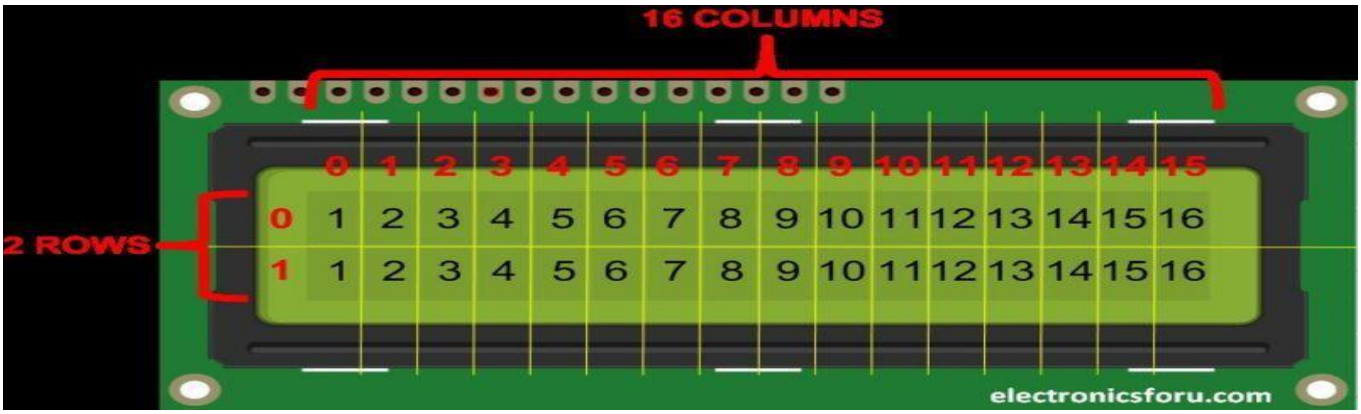
Details About 16x2 LCD Display given below:



No.	PIN	Function
1	VSS	Ground
2	VCC	+5 Volt
3	VEE	Contrast control 0 Volt: High contrast.

No.	PIN	Function
4	RS	Register Select 0: Commannd Reg. 1: Data Reg.
5	RW	Read / write 0: Write 1: Read
6	E	Enable H-L pulse
7-14	D0 - D7	Data Pins D7: Busy Flag Pin
15	LED+	+5 Volt
16	LED-	Ground

EW

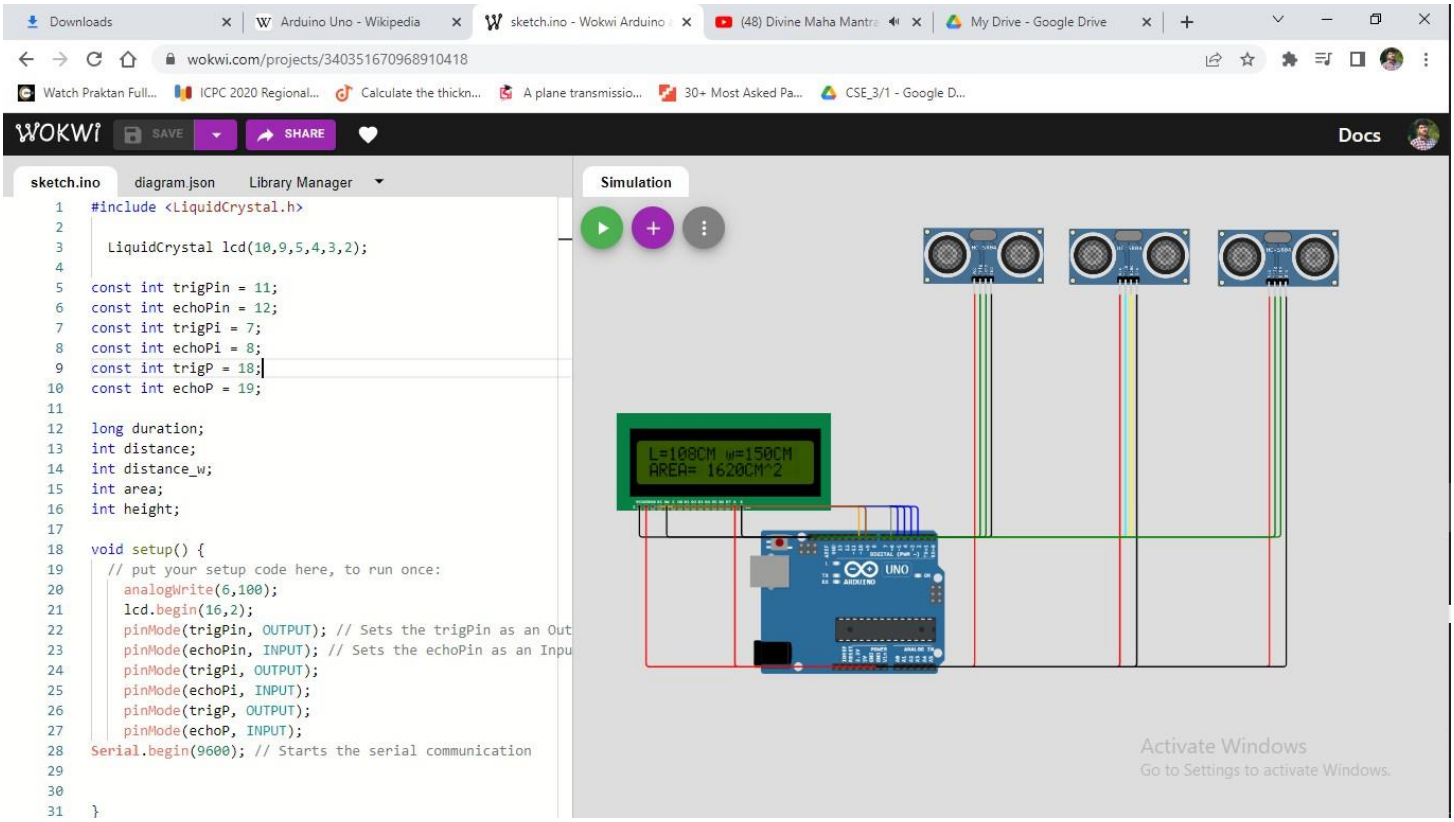


To connect All these parts we need a Bread board, But for Reduce the cost we make a alternate way of bread board by jumper wire.

Before physical implementation, We was design and run the full project in a simulator.

The simulation of this project we have save in online.

Anyone can check it by this link: https://wokwi.com/projects/340348199568933459



Finally our Project physically looks:

It can measure height, wide, length, Area, Volume of any object.