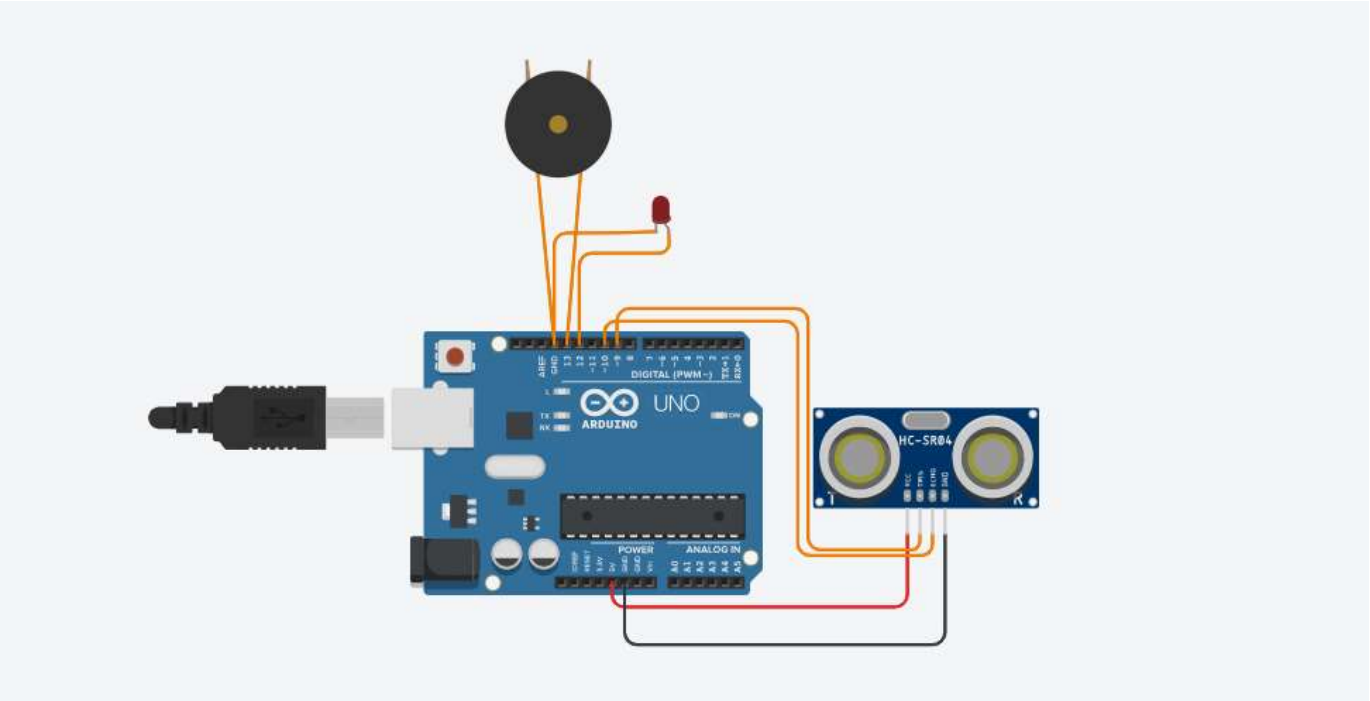
Exp 6:- Design an obstacle detector and distance measuring device.

Circuit Diagram:-



Theory: -

Concept used:-

- The Arduino board can supply a power of 5V as digital output signals through the 14 pins (namely 0-13) present in it as digital input or output pins. The GND pin of the Arduino board acts as ground (It provide 0V).

- Ultra-sonic Sensor is used to detect the distance of the closest object in front of the sensor (from 3 cm up to 400 cm). It works by sending out a burst of ultrasound and listening for the echo when it bounces off of an object. It pings the obstacles with ultrasound.

- The Arduino or Genuino board sends a short pulse to trigger the detection, then listens for a pulse on the same pin using the pulseIn() function. The duration of this second pulse is equal to the time taken by the ultrasound to travel to the object and back to the sensor. Using the speed of sound, this time can be converted to distance.

- Distance=speed/time : this formula is used to find the distance .

Learning and Observation: -

Learnings:

- Learned how to use ultrasonic with arduino.
- Learned how to make obstacle detector.

Observations:-

- When the code is uploaded to the Arduino broad it worked accordingly i.e. the led and buzzer become active whenever the ultrasonic sensor detect any obstacle within a range of 1m.

Problem and Troubleshooting:-

- The code was not uploading to the Arduino because of the wrong port selection. Make sure to choose the correct port just after connecting Arduino with the PC.
- Problem in compilation due to syntax error. So make sure to write the correct code

- Problem in sketching i.e. code uploading due to problem in Arduino IDE. If this problem is encountered start the IDE again.
- Make sure the connections are correct.

Precautions:-

- Make sure the circuit is closed
- The connections at different points should not be loose and the pins should be inserted properly.
- Make sure ultrasonic sensor is not damaged.
- Handle ultrasonic pins with care and don't bend the PINS of the ultrasonic.

Learning Outcomes:-

• I have learned how to use a Ultrasonic sensor with arduino.

• Through this experiment I have gained the skill of making a circuit using different hardware and controlling the functions done by that circuit with the help of codes.

• I have learned how to create obstacle detector using ultra sonic sensor which can also be used to make intruder detector along with a Led and a buzzer using if/else statement.