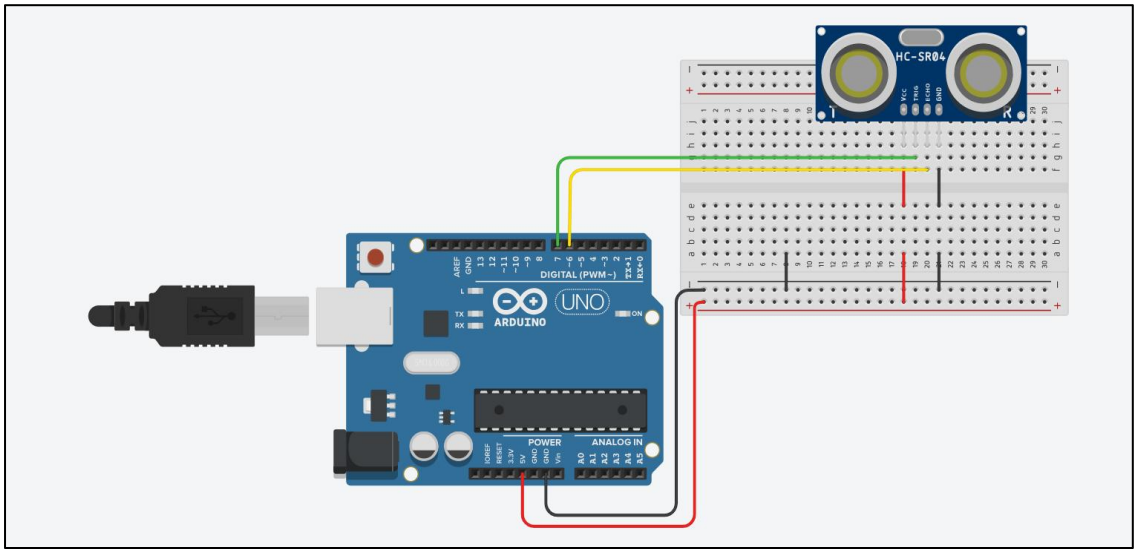
Experiment-5 Distance measurement with Ultrasonic Sensor

Aim:- **Measure the distance of an object using an Ultrasonic sensor and display it on serial monitor.**

Apparatus:-



Software Code:-

```
int trigPin = 7;
int echoPin = 6;
long time;
float distance;

void setup()
{
  pinMode(trigPin, OUTPUT);
  pinMode(echoPin, INPUT);
  Serial.begin(9600);
}

void loop()
{
  digitalWrite(trigPin,LOW);
```

```
delayMicroseconds(10);
  digitalWrite(10, LOW);

  time=pulseIn(echoPin , HIGH);
  Serial.print("time: ");
  Serial.println(time);
  distance = time * 0.0343/2;

  Serial.print("Distance:");
  Serial.println(distance);
  delay(1000);
}
```

New Commands Used:-

i. **void setup() :** This function is called once when the program starts. It is used to initialize settings, such as pin modes and serial communication.

ii. **pinMode() :** This command configures the specified pin to behave either as an input or an output.

iii. **void loop() :** This function runs continuously after the setup() function. It contains the main logic of the program.

iv. **digitalWrite(trigPin, LOW):** Sets the trigPin to LOW to ensure a clean pulse signal before triggering

v. **pulseIn(echoPin, HIGH):**Measures the time duration for which the echoPin remains HIGH.

vi. **delayMicroseconds(2):** Pauses the program for 2 microseconds to stabilize the signal.

vii. **digitalWrite():** This command sets the specified digitalpin to either HIGH (turns on the LED) or LOW (turns off the LED).

viii. **delay() :** This command pauses the program for the specified number of milliseconds (1000 ms = 1 second). It is used to create a delay between readings.

Conclusion:-

This Arduino program uses an **ultrasonic sensor** to measure distance by sending a pulse and detecting its echo. The time taken for the echo is converted into distance and displayed on the **Serial Monitor**. It continuously repeats this process every second, making it useful for distance sensing in robotics and automation.