Experiment 5

Student Name: Praduman Kumar **UID:** 20BCS9446
Branch: CSE **Section/Group:** DM714-A
Semester: 6
Subject Name: IOT Lab **Subject Code:** 20CSP-358

1. Aim:
To measure the distance of an object using an ultrasonic sensor.

2. Components Required:

- Arduino Uno R3 board
- Ultrasonic sensor (HC-SR04)
- Breadboard
- 4x Jumper Wires

3. Theory:

Ultrasonic Sensor:
An ultrasonic Sensor is a device used to measure the distance between the sensor and an object without physical contact. This device works based on time-to-distance conversion.

Working Principle:
We know that the speed of sound in air is nearly 344 m/s,

Using these parameters, we can calculate the distance traveled by the sound wave.

Formula: Distance = Speed * Time

4. Script:

```
long duration,distance;
void setup() {
  // put your setup code here, to run once:
  Serial.begin(9600);
```

```
  pinMode(9,OUTPUT);
  pinMode(4,INPUT);

}

void loop() {
  // put your main code here, to run repeatedly:
  digitalWrite(9,LOW);
  delayMicroseconds(10);
  digitalWrite(9,HIGH);
  delayMicroseconds(10);
  digitalWrite(9,LOW);
  duration=pulseIn(4,HIGH);
  distance=0.0343*duration/2;
  Serial.print("Distance:");
  Serial.println(distance);
}
```

5. Output:

```
Distance:10
Distance:10
Distance:11
Distance:11
Distance:11
Distance:11
Distance:11
Distance:12
Distance:12
Distance:13
Distance:14
Distance:14
Distance:14
Distance:15
Distance:16
Distance:16
Distance:16
Distance:17
```

6. Learning Outcome:

- Use of ultrasonic sensor
- Connection using breadboard
- Use of Arduino