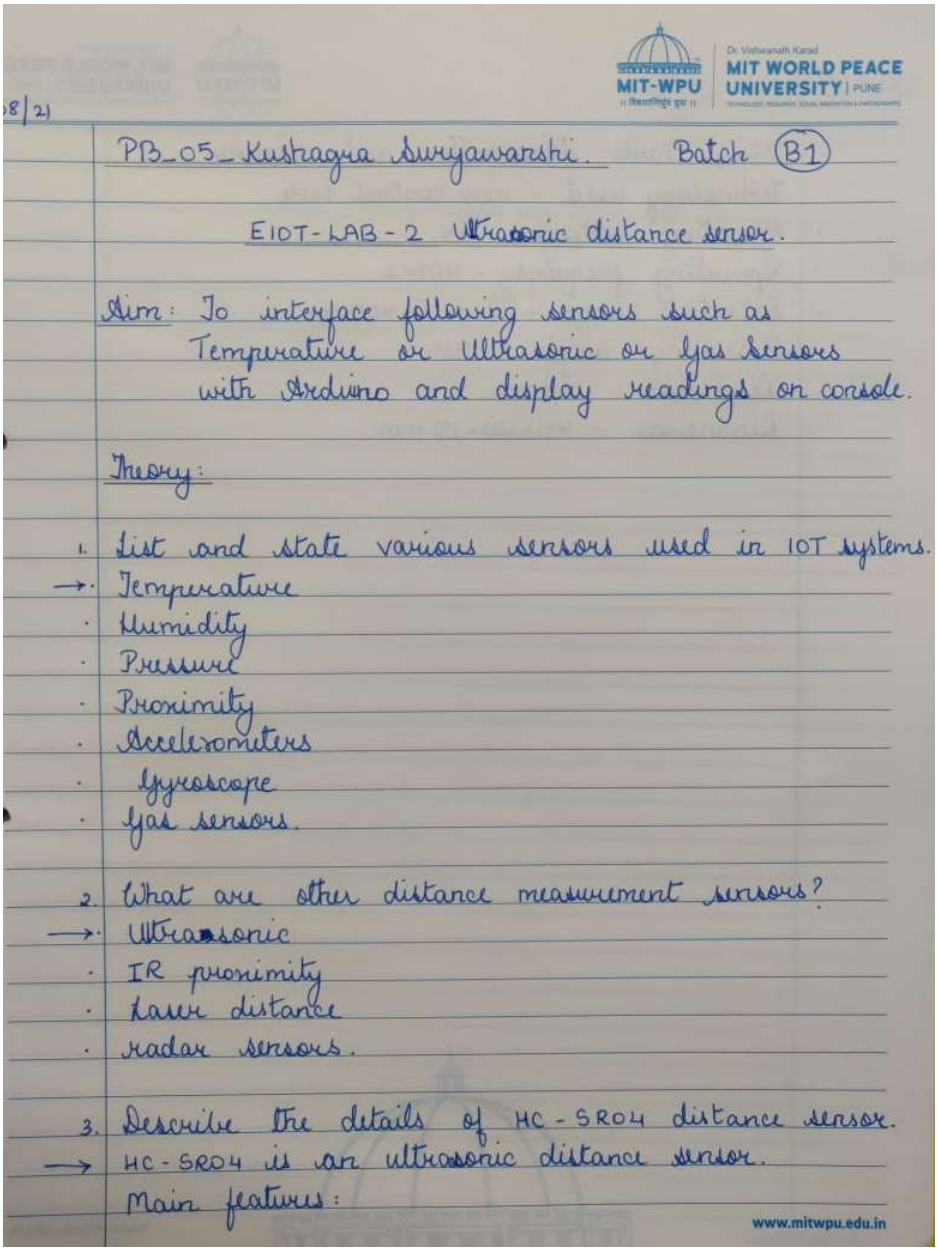
PB_05_Kushagra Suryawanshi Sub: EIOT Batch: B1 Date: 18/08/2021

# Lab 02 - Ultrasound distance sensor using Tinker CAD Arduino

***Aim:*** To Interface following sensors such as Temperature or Ultrasonic or Gas sensors with Raspberry-Pi/Beagle board/ TinkerCAD Arduino etc. and display readings on console.

***Theory:***



PB_05_Kushagra Suryawanshi. Batch (B1)

EIOT-LAB-2 Ultrasonic distance sensor.

Aim: To interface following sensors such as Temperature or Ultrasonic or Gas sensors with Arduino and display readings on console.

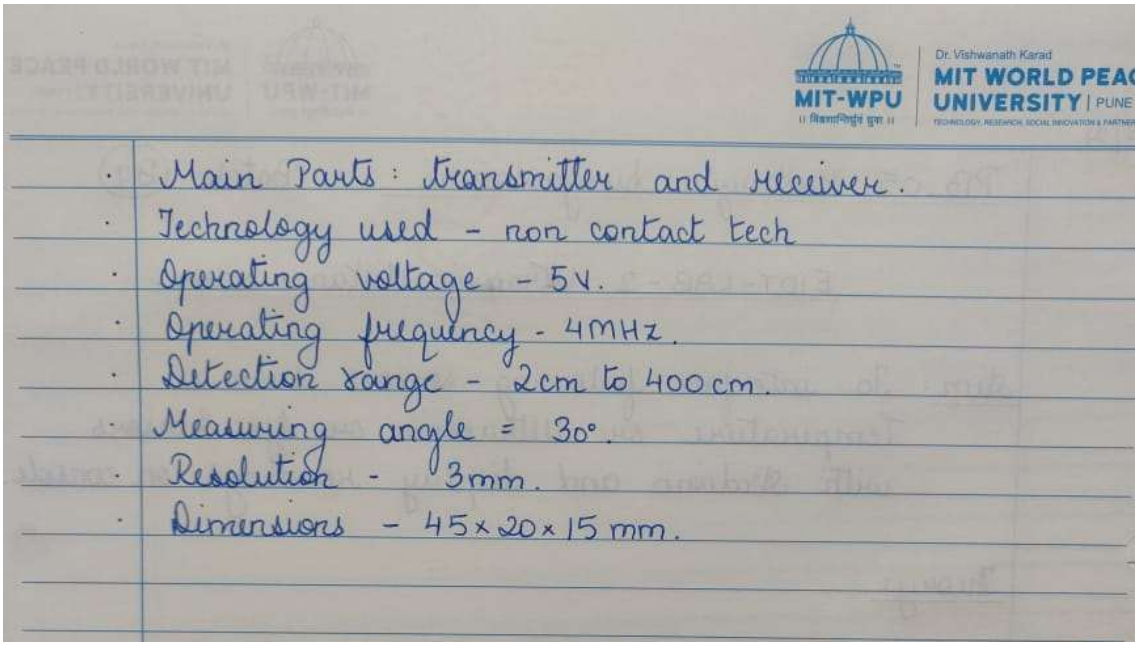
Theory:

1. List and state various sensors used in IOT systems.
→ · Temperature
· Humidity
· Pressure
· Proximity
· Accelerometers
· Gyroscope
· Gas sensors.

2. What are other distance measurement sensors?
→ · Ultrasonic
· IR proximity
· Laser distance
· radar sensors.

3. Describe the details of HC-SR04 distance sensor.
→ HC-SR04 is an ultrasonic distance sensor.
Main features:

www.mitwpu.edu.in

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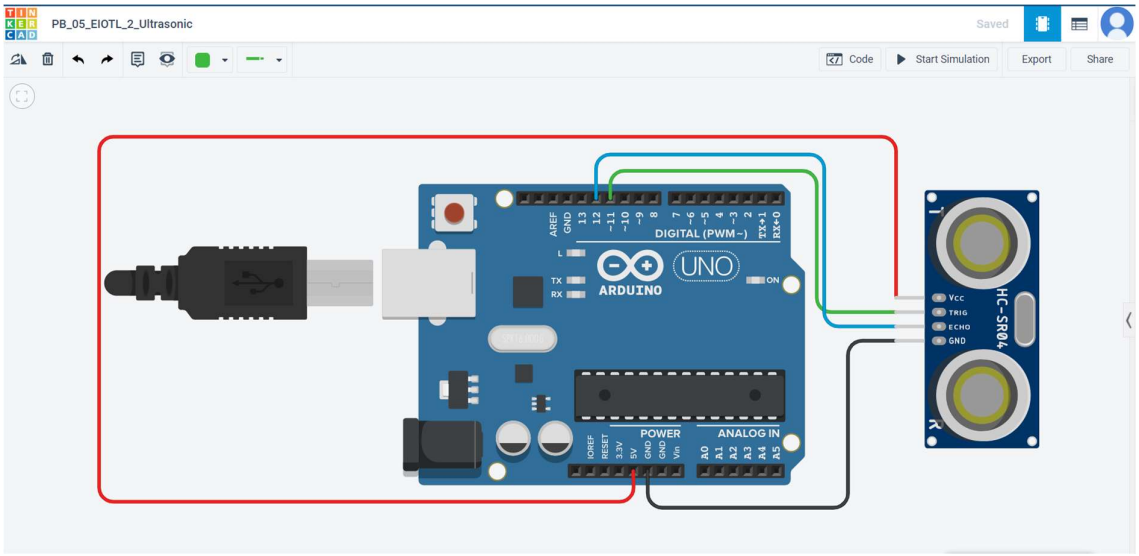
***Ultrasonic distance sensor:***

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***Explanation:*** In this experiment I have made a distance sensor circuit using an Arduino uno board, HC-SR04 Ultrasonic distance sensor. The VCC and GND pins of sensor are connected to Arduino's 5V supply and GND respectively. Input/Output of sensor, i.e, transmitter and receiver are connected to ports 11 and 12.

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***Code:***

```
// C++ code
// PB_05_Kushagra Suryawanshi
//
const int trigPin = 11;
const int echoPin = 12;
int duration;
long distance;
void setup()
{
  pinMode(trigPin, OUTPUT);
  pinMode(echoPin, INPUT);
  Serial.begin(9600);
}
void loop()
{
  //clear trigPin
  digitalWrite(trigPin, LOW);
  delayMicroseconds(2);
  digitalWrite(trigPin, HIGH);
  delayMicroseconds(10);
  digitalWrite(trigPin, LOW);
  //blue is echopin...read echopin, returns sound wave travel time in microsecs
  duration = pulseIn(echoPin, HIGH);
  //calculating distance
  Serial.print("Round trip time from the object = ");
```

```
  Serial.print(duration);
  Serial.println(" microsec");
  distance = (duration *0.000001 * 34000)/2;
  //print distance on serial monitor
  Serial.print("Distance from the object = ");
  Serial.print(distance);
  Serial.println(" cm");
  delay(1000); // Wait for 1000 millisecond(s)
}
```

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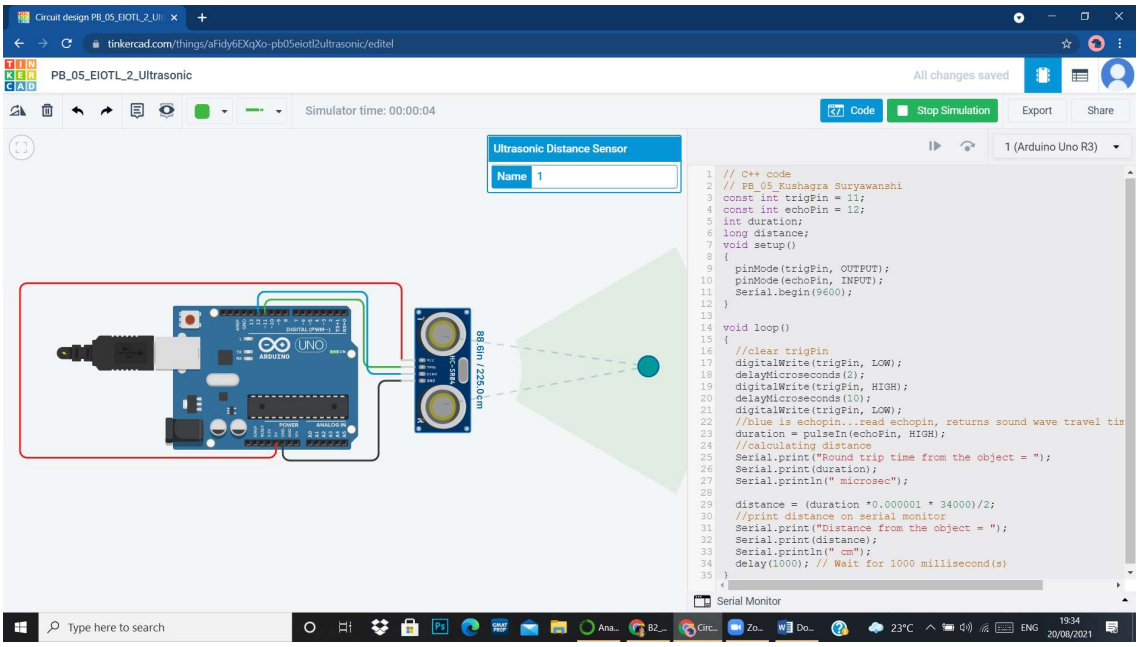


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***Conclusion:*** Thus, we learnt about Ultrasonic distance sensor and temperature sensor and how to interface them with Arduino uno board.

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***Simulation Link:*** https://www.tinkercad.com/things/aFidy6EXqXo-pb05eiotl2ultrasonic/editel?sharecode=PLZ1yBKLehd7loZLZPzMPj0WkiQwHja2aD3eLsamxyg