

Assignment-I

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Problem:

Build a smart home in Thinkercad with 2 sensors, an Led, buzzer

Program:

```
RIG_PIN const int T = 10; // Arduino pin connected to Ultrasonic Sensor's TRIG pin
const int ECHO_PIN = 9; // Arduino pin connected to Ultrasonic Sensor's ECHO pin
const int BUZZER_PIN = 2; // Arduino pin connected to Piezo Buzzer's pin
const int LED_PIN = 7;
const int DISTANCE_THRESHOLD_MAX = 40; // centimeters
const int DISTANCE_THRESHOLD_MIN = 0;
const int TEMP_THRESHOLD = 10;
const int TEMP_THRESHOLD1 = 70;

// variables will change:
float duration_us, distance_cm;
int sensorPin = 0;
void setup() {
    Serial.begin(9600); // initialize serial port
    pinMode(TRIG_PIN, OUTPUT); // set arduino pin to output mode
    pinMode(ECHO_PIN, INPUT); // set arduino pin to input mode
```

```
pinMode(BUZZER_PIN, OUTPUT); // set arduino pin to output mode
}

void loop() {

    digitalWrite(TRIG_PIN, HIGH);
    delayMicroseconds(10);
    digitalWrite(TRIG_PIN, LOW);

    duration_us = pulseIn(ECHO_PIN, HIGH);

    distance_cm = 0.017 * duration_us;

    if(distance_cm >= DISTANCE_THRESHOLD_MIN&&distance_cm <
DISTANCE_THRESHOLD_MAX)
    {
        int reading = analogRead(sensorPin);

        float voltage = reading * 5.0;
        voltage /= 1024.0;

        Serial.print(voltage); Serial.println(" volts");

        digitalWrite(BUZZER_PIN, HIGH);

        float temperatureC = (voltage - 0.5) * 100 ;

        Serial.println(" degrees C");
        if(temperatureC<TEMP_THRESHOLD){
            digitalWrite(BUZZER_PIN, HIGH);
        }
    }
}
```

```
digitalWrite(LED_PIN, HIGH);
Serial.print("Temperature is below average \n");
}

else if(temperatureC>TEMP_THRESHOLD1){
    digitalWrite(BUZZER_PIN, HIGH);
    digitalWrite(LED_PIN, HIGH);
    Serial.print("Temperature is above average \n");
}

else{
    digitalWrite(BUZZER_PIN, LOW);
    digitalWrite(LED_PIN, LOW);
}

}

else if(distance_cm>=40&&distance_cm<=120){
    digitalWrite(BUZZER_PIN, HIGH);
    digitalWrite(LED_PIN, HIGH);

    Serial.print("Distance: ");
    Serial.print(distance_cm);
    Serial.println(" cm");

    delay(500);
}

else{
```

```
digitalWrite(BUZZER_PIN,LOW);  
digitalWrite(LED_PIN, LOW);  
}  
}
```

Circuit Diagram:

