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## ASSIGNMENT:2

## Build a smart home in Thinkercad with 2 sensors, an Led, buzzer and submit it.

```
// ***
LCD
Display
***

#include<LiquidCrystal.h>
LiquidCrystal lcd(2,3,4,5,6,7);

// *** Ultrasonic Sensor ***
int trigPin = 12;
int echoPin = 13;
float travelTime;
float level;
float speed;//miles per hour

float readStatusofContainer(int trigPin,int echoPin)
{
    //sending ping
    digitalWrite(trigPin,LOW);
    delayMicroseconds(100);
    digitalWrite(trigPin,HIGH);
    delayMicroseconds(10);
    digitalWrite(trigPin,LOW);
    //returns round trip time of container status
    return pulseIn(echoPin,HIGH);
}

// *** DC Motor ***
int motorPin = 8;
```

```
// *** PIR Sensor ***
int pirPin = 9;

// *** Light ***
int lightPin = 10;

// *** Gas Sensor ***
int gasPin = A0;
int threshold = 400;

// *** Piezo ***
int buzzPin = 11;

// *** LED ***
int ledPin = 0;

void setup()
{
    Serial.begin(9600);

    // *** LCD Display ***
    lcd.begin(16,2);

    // *** Ultrasonic Sensor ***
    pinMode(trigPin,OUTPUT);
    pinMode(echoPin,INPUT);

    // *** DC Motor ***
    pinMode(motorPin,OUTPUT);

    // *** PIR Sensor ***
    pinMode(pirPin,INPUT);

    // *** Light ***
    pinMode(lightPin,OUTPUT);

    // *** Gas Sensor ***
    pinMode(gasPin,INPUT);

    // *** Piezo ***
    pinMode(buzzPin, OUTPUT);
```

```

// *** LED ***
pinMode(ledPin,OUTPUT);
}

void loop()
{
    // *** Trash can monitoring ***
    // Trash can height 5 inches
    travelTime = readStatusofContainer(trigPin,echoPin);//microseconds
    travelTime = travelTime/1000000;//seconds
    travelTime = travelTime/3600;//hours
    speed = 60.0;//miles per hour(86.4 for 5 inches)
    level = speed * travelTime;//miles
    level = level/2;//because travelTime is round trip time
    level = level * 63360;//inch
    if(level <= 4.5)
    {
        //dispaly status
        lcd.clear();
        lcd.setCursor(0,0);
        lcd.print("Trash Level:");
        lcd.setCursor(0,1);
        lcd.print(level);
        lcd.print(" inches");
        delay(100);
    }
    else
    {
        //dispaly status
        lcd.clear();
        lcd.setCursor(0,0);
        lcd.print("Trash is full");
        lcd.setCursor(0,1);
        lcd.print(level);
        lcd.print(" inches away");
        delay(100);
    }

    // *** Water level monitoring ***
    // Water tank height 20 inches
    travelTime = readStatusofContainer(trigPin,echoPin);//microseconds
    travelTime = travelTime/1000000;//seconds
    travelTime = travelTime/3600;//hours
    speed = 240.1;//miles per hour(345.3 for 20 inches)

```

```

level = speed * travelTime;//miles
level = level/2;//because travelTime is round trip time
level = level * 63360;//inch
if(level <= 19.0)
{
    //display status and Turn on motor
    digitalWrite(motorPin,HIGH);
    lcd.clear();
    lcd.setCursor(0,0);
    lcd.print("Level:    Motor");
    lcd.setCursor(0,1);
    lcd.print(level);
    lcd.print(" in    On");
    delay(100);
}
else
{
    //display status and Turn off motor
    digitalWrite(motorPin,0);
    lcd.clear();
    lcd.setCursor(0,0);
    lcd.print("Level:    Motor");
    lcd.setCursor(0,1);
    lcd.print(level);
    lcd.print(" in    Off");
    delay(100);
}

// *** Motion Detection
if(digitalRead(pirPin)==HIGH)
    digitalWrite(lightPin, HIGH);
else
    digitalWrite(lightPin, LOW);
delay(100);

// *** Detects flammable gases ***
if(analogRead(gasPin) >= threshold)
{
    digitalWrite(ledPin,HIGH);
    digitalWrite(buzzPin,HIGH);
}
else
{
    digitalWrite(ledPin,LOW);
    digitalWrite(buzzPin,LOW);
}

```

```
delay(100);  
}
```