# B2-2M4E

| | |
|---|---|
| **Title** | Hazardous Area Monitoring for Industrial Plant powered by IoT |
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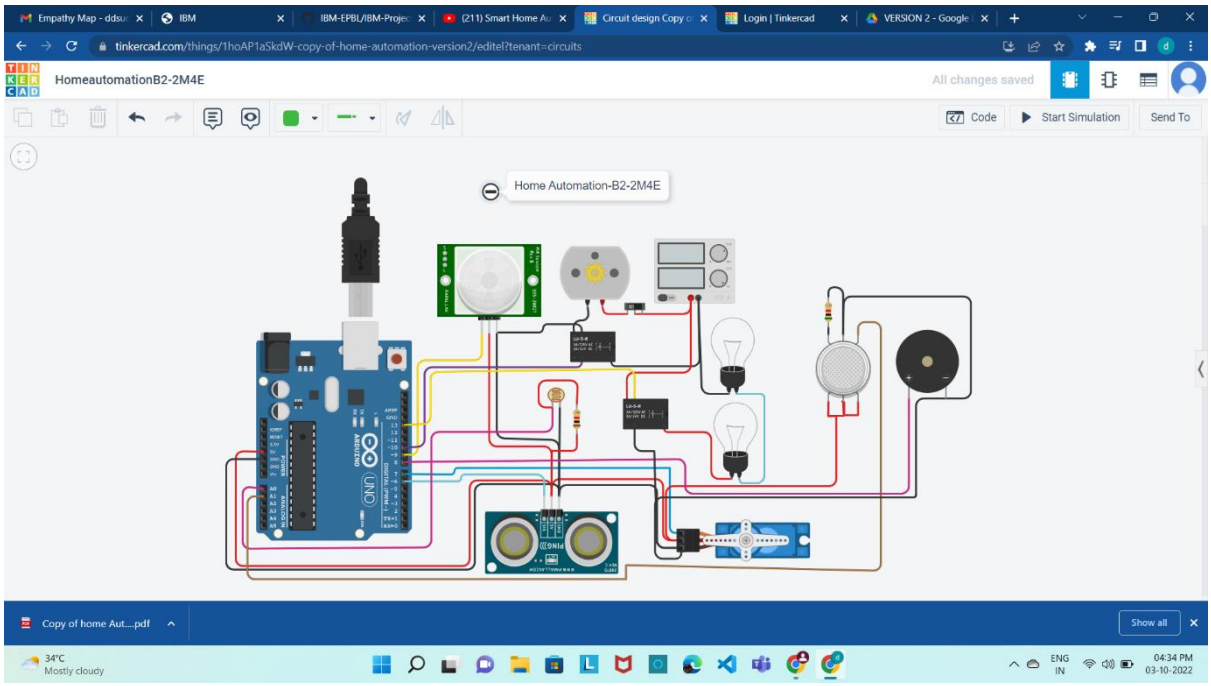
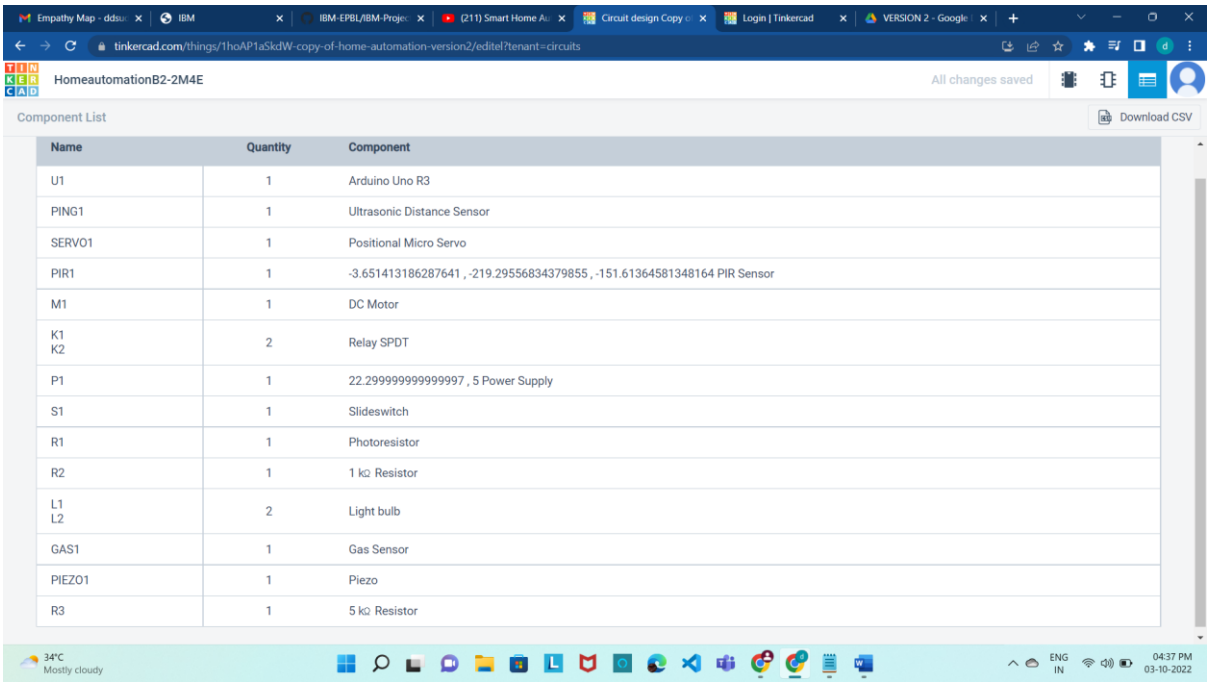
| **Assignment** | Home Automation in Tinkercad |

## Circuit Diagram:




**Component List:**

Components Needed:




## Simulation Code:

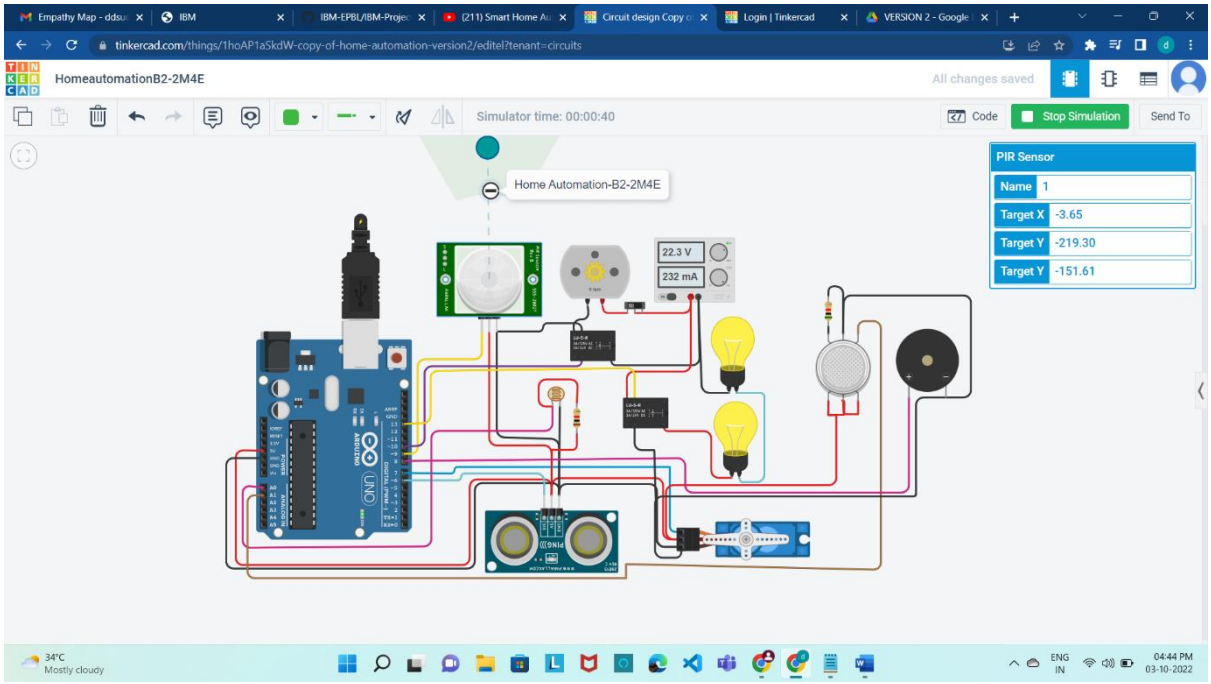
```
#include <Servo.h>

int output1Value = 0;

int sen1Value = 0;

int sen2Value = 0;

int const gas_sensor = A1;

int const LDR = A0;

int limit = 400;

long readUltrasonicDistance(int triggerPin, int echoPin)

{

  pinMode(triggerPin, OUTPUT);  // Clear the trigger

  digitalWrite(triggerPin, LOW);

  delayMicroseconds(2);

// Sets the trigger pin to HIGH state for 10 microseconds

  digitalWrite(triggerPin, HIGH);

  delayMicroseconds(10);

  digitalWrite(triggerPin, LOW);

  pinMode(echoPin, INPUT);
```

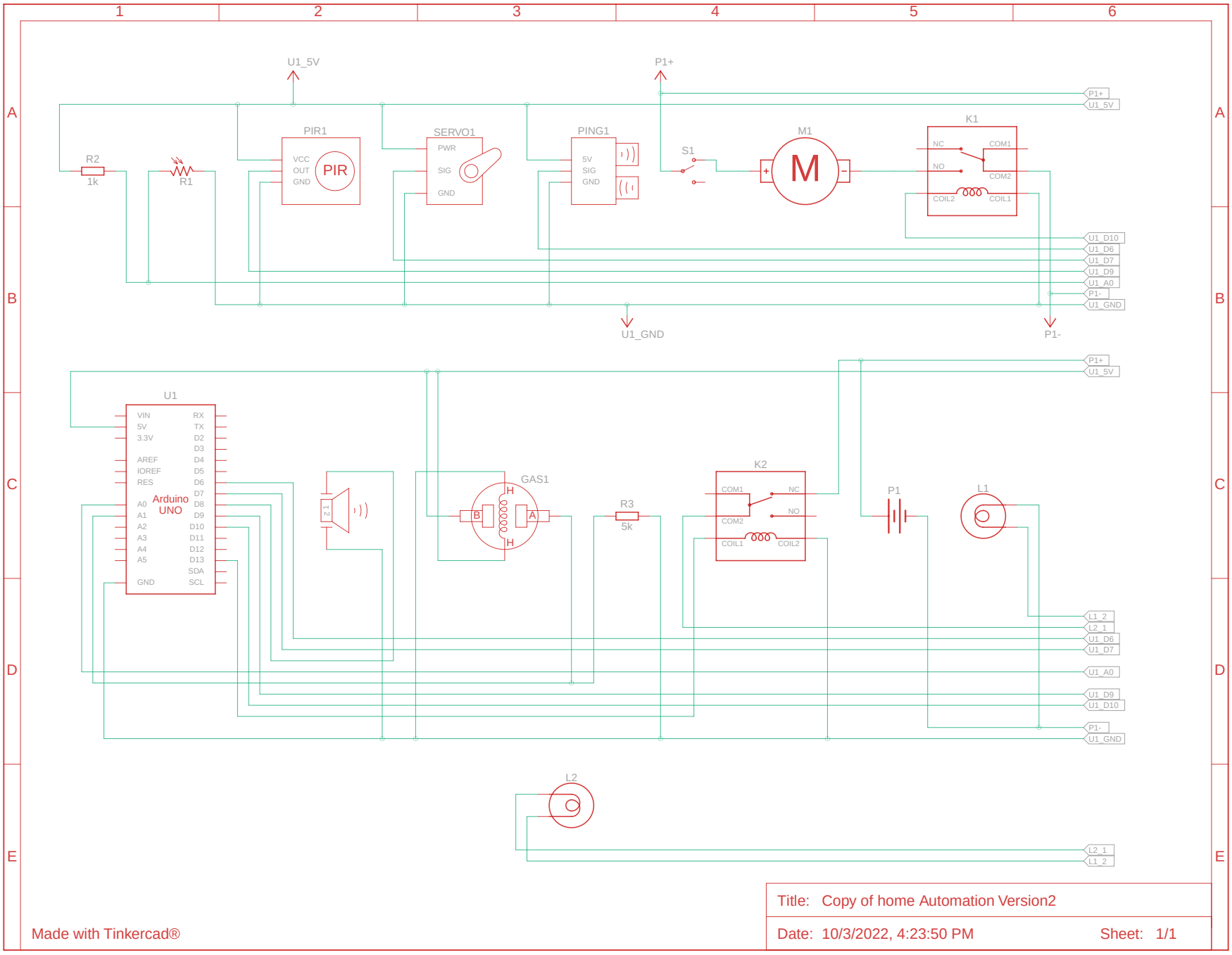
```
  // Reads the echo pin, and returns the sound wave travel time in microseconds
  return pulseIn(echoPin, HIGH);
}
Servo servo_7;
void setup()
{
   Serial.begin(9600);                //initialize serial communication
  pinMode(A0, INPUT);                 //LDR
  pinMode(A1,INPUT);                  //gas sensor
  pinMode(13, OUTPUT);                        //connected to relay
  servo_7.attach(7, 500, 2500); //servo motor

  pinMode(8,OUTPUT);                  //signal to piezo buzzer
  pinMode(9, INPUT);                  //signal to PIR
  pinMode(10, OUTPUT);                        //signal to npn as switch
  pinMode(4, OUTPUT);                 //Red LED
  pinMode(3, OUTPUT);                 //Green LED

}
void loop()
{

    //------light intensity control------//
//-------------------------------------------------------------
   int val1 = analogRead(LDR);
  if (val1 > 500)
            {
            digitalWrite(13, LOW);
   Serial.print("Bulb ON = ");
   Serial.print(val1);
            }
```

```
 else
          {
          digitalWrite(13, HIGH);
   Serial.print("Bulb OFF = ");
  Serial.print(val1);
          }

//-------------------------------------------------------------
      //------ light & fan control --------//
//-------------------------------------------------------------
 sen2Value = digitalRead(9);
 if (sen2Value == 0)
          {
          digitalWrite(10, LOW); //npn as switch OFF
          digitalWrite(4, HIGH); // Red LED ON,indicating no motion
          digitalWrite(3, LOW); //Green LED OFF, since no Motion detected
  Serial.print("     || NO Motion Detected    " );
          }

 if (sen2Value == 1)
          {
          digitalWrite(10, HIGH);//npn as switch ON
  delay(5000);
          digitalWrite(4, LOW); // RED LED OFF
          digitalWrite(3, HIGH);//GREEN LED ON , indicating motion detected
   Serial.print("    || Motion Detected!      " );
          }
 //-------------------------------------------------------------
     // ------- Gas Sensor --------//
//-------------------------------------------------------------
int val = analogRead(gas_sensor);     //read sensor value
```

```
 Serial.print("|| Gas Sensor Value = ");
 Serial.print(val);                                    //Printing in serial monitor
//val = map(val, 300, 750, 0, 100);
 if (val > limit)
          {
          tone(8, 650);
          }
          delay(300);
          noTone(8);

 //-------------------------------------------------------------
    //-------  servo motor  ---------//
 //-------------------------------------------------------------
 sen1Value = 0.01723 * readUltrasonicDistance(6, 6);
 if (sen1Value < 100)
          {
          servo_7.write(90);
   Serial.print("    || Door Open!  ; Distance = ");
   Serial.print(sen1Value);
  Serial.print("\n");

          }
 else
          {
          servo_7.write(0);
   Serial.print("    || Door Closed! ; Distance =  ");
   Serial.print(sen1Value);
   Serial.print("\n");
 }
 delay(10); // Delay a little bit to improve simulation performance
}
```

# Simulation


tinkercad.com/things/1hoAP1aSkdW-copy-of-home-automation-version2/editel?tenant=circuits
HomeautomationB2-2M4E
All changes saved
Simulator time: 00:00:40
Code
Stop Simulation
Send To
Home Automation-B2-2M4E
22.3 V
232 mA
PIR Sensor
Name 1
Target X -3.65
Target Y -219.30
Target Y -151.61
34°C
Mostly cloudy
ENG
IN
04:44 PM
03-10-2022


1
2
3
4
5
6
A
B
C
D
E
U1_5V
P1+
R2
1k
R1
PIR1
VCC
OUT
GND
PIR
SERVO1
PWR
SIG
GND
PING1
5V
SIG
GND
S1
M1
M
K1
NC
COM1
NO
COM2
COIL2
COIL1
U1_D10
U1_D6
U1_D7
U1_D9
U1_A0
P1-
U1_GND
U1
VIN
5V
3.3V
AREF
IOREF
RES
A0
A1
A2
A3
A4
A5
RX
TX
D2
D3
D4
D5
D6
D7
D8
D9
D10
D11
D12
D13
SDA
SCL
GND
Arduino
UNO
P1
GAS1
H
B
A
H
R3
5k
K2
COM1
NC
NO
COM2
COIL1
COIL2
P1
L1
L1_2
L2_1
U1_D6
U1_D7
U1_A0
U1_D9
U1_D10
P1-
U1_GND
L2
L2_1
L1_2
Made with Tinkercad®
Title: Copy of home Automation Version2
Date: 10/3/2022, 4:23:50 PM
Sheet: 1/1