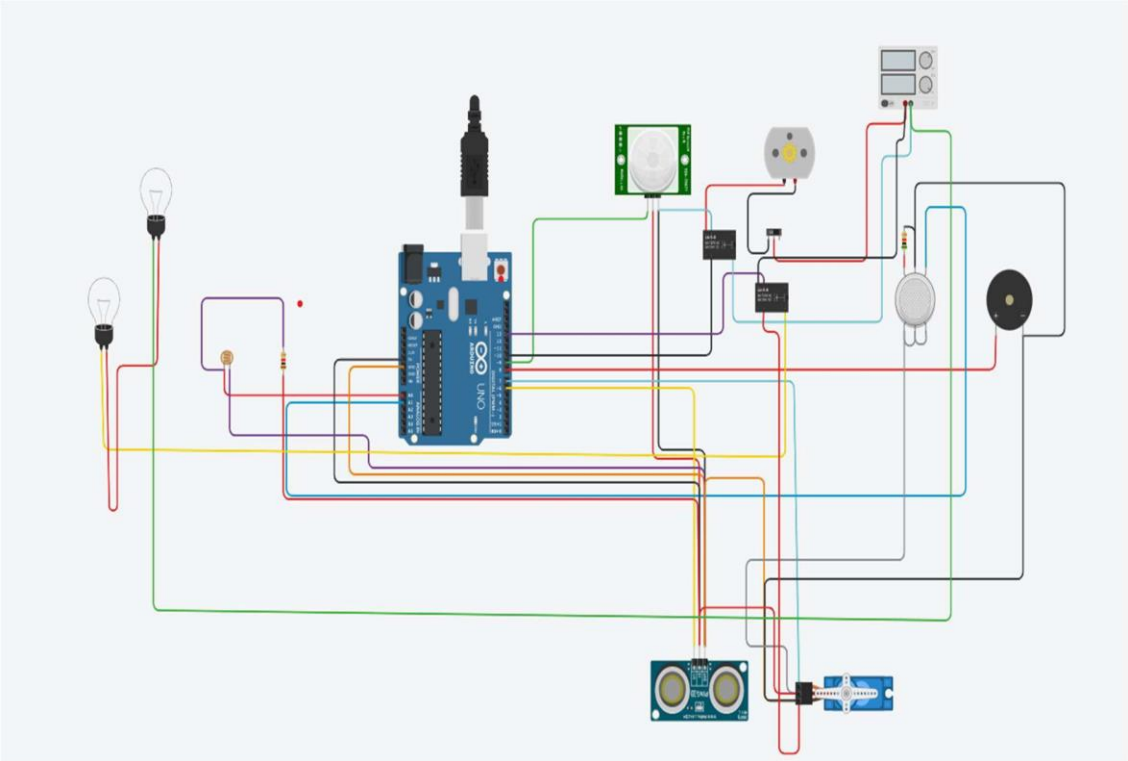
**Assignment -1**

| | |
|---|---|
| Assignment Date | 19 September 2022 |
| Student Name | VASANTH KUMAR M S |
| Student Roll Number | 2019504605 |
| Maximum Marks | 2 Marks |

**Question-1:**

Home Automation using Tinker cad:

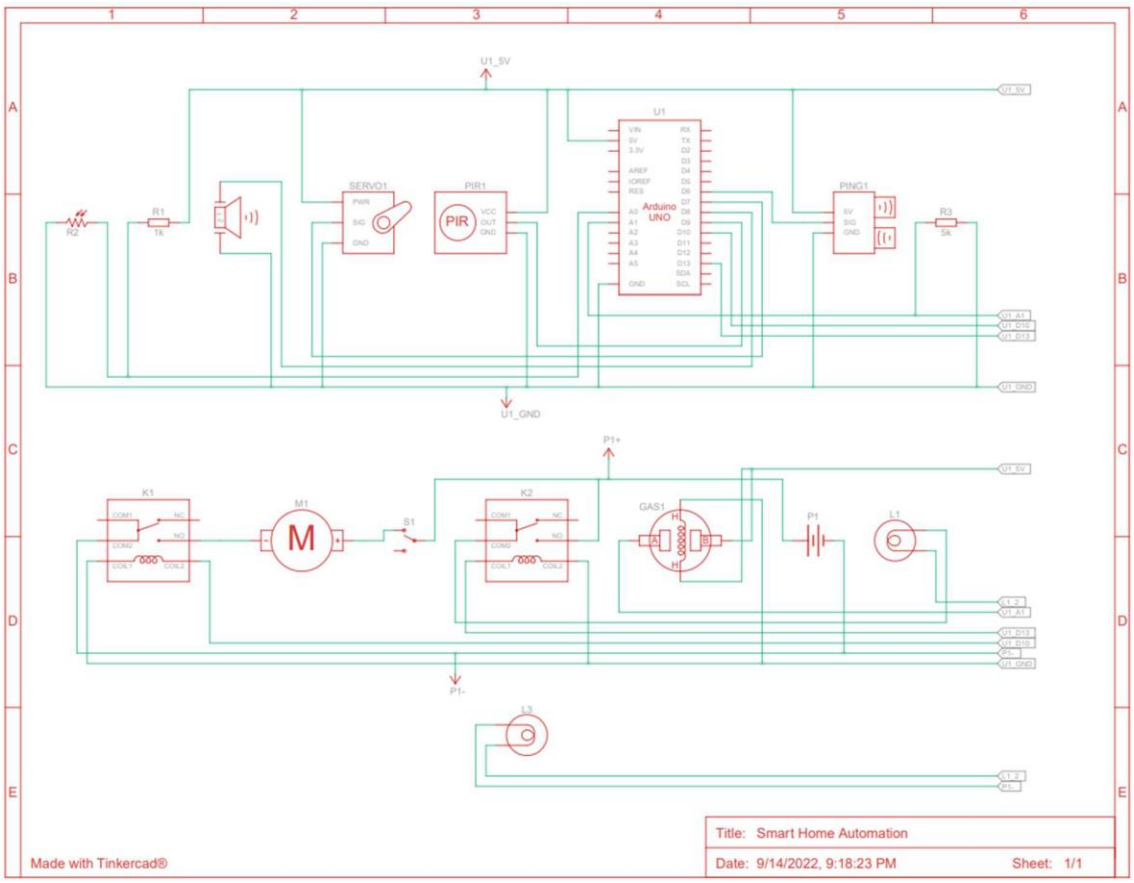
**Design:**



**Components Required:**

| Name | Quantity | Component |
|---|---|---|
| U1 | 1 | Arduino Uno R3 |
| PIR1 | 1 | -17.358178557221777 , -247.4289412888927 , -197.15541335786304 , -230.71302788180571 PIR Sensor |
| SERVO1 | 1 | Positional Micro Servo |
| PIEZO1 | 1 | Piezo |
| GAS1 | 1 | Gas Sensor |
| M1 | 1 | DC Motor |
| R1 | 1 | 1 kΩ Resistor |
| R2 | 1 | Photoresistor |
| K1, K2 | 2 | Relay SPDT |
| S1 | 1 | Slideswitch |
| P1 | 1 | 20 , 5 Power Supply |
| PING1 | 1 | Ultrasonic Distance Sensor |
| R3 | 1 | 5 kΩ Resistor |
| L3, L1 | 2 | Light bulb |

**Schematic:**




**Reference:**

https://www.tinkercad.com/things/iALvOmx0rCs-smart-home-automation/editel?sharecode=V-FGFN0jR2Em9kIPHNAKc7WFop_xODpLJNjg5_UTQw8&sharecode=V-FGFN0jR2Em9kIPHNAKc7WFop_xODpLJNjg5_UTQw8

**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);
  digitalWrite(triggerPin,  HIGH);
```

```
  delayMicroseconds(10);
  digitalWrite(triggerPin, LOW);
  pinMode(echoPin, INPUT);
  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()
{

    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);
    }


  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(3000);
    digitalWrite(4, LOW); // RED LED OFF
    digitalWrite(3, HIGH);//GREEN LED ON , indicating motion detected
    Serial.print("      || Motion Detected!     " );
   }
  delay(300);


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);


  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
}
```