IBM NALAIYA THIRAN

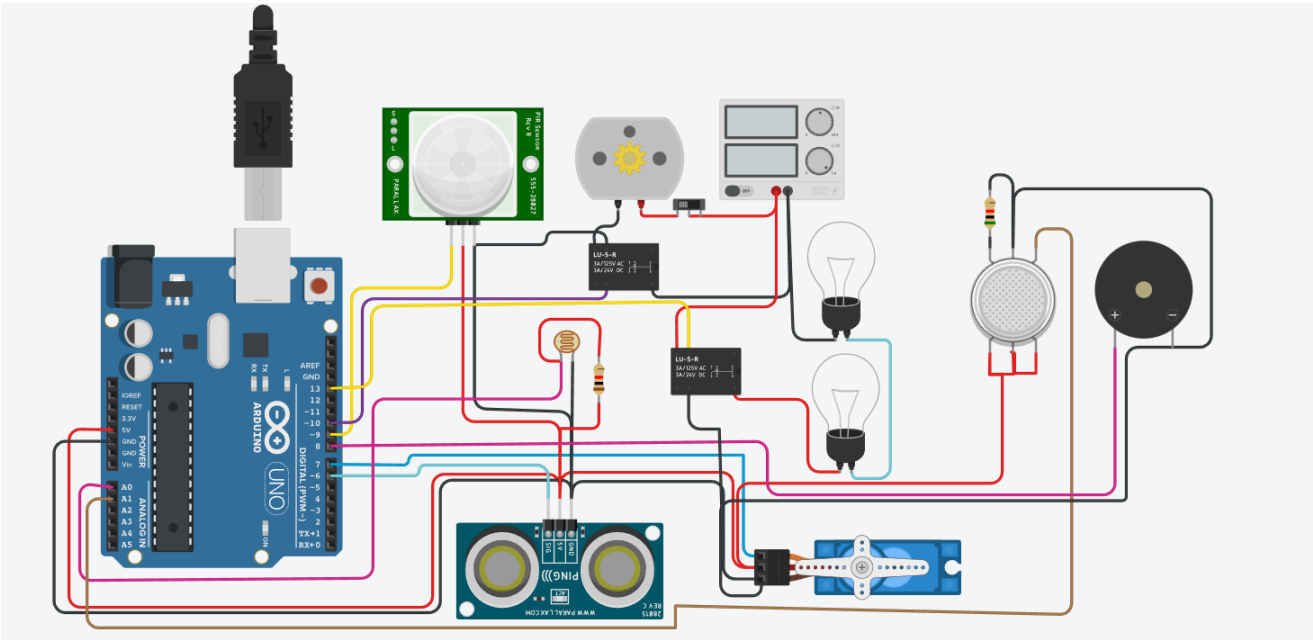
ASSIGNMENT – 1

Home Automation

Tinkercad Stimulation Link:

https://www.tinkercad.com/things/7rWRUcf37xr?sharecode=eFVvdkyDhLOeY0pHxzV8JfJfpwmw3a-Rj-sTNnNe_GM

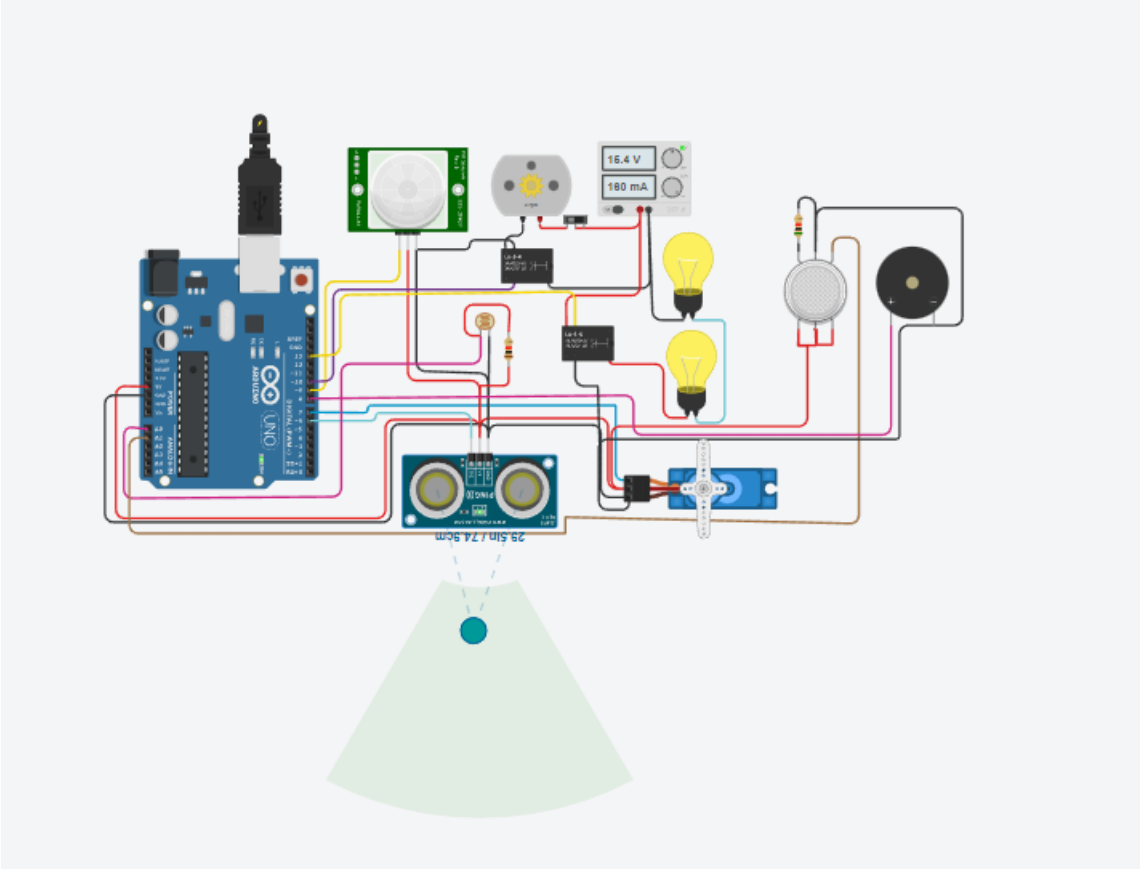
Circuit Design:



Name	Quantity	Component
U1	1	Arduino Uno R3
PING1	1	Ultrasonic Distance Sensor
SERVO1	1	Positional Micro Servo
PIR1	1	-3.651413186287641 , -219.29556834379855 , -151.61364581348164 , -215.7541614393947 PIR Sensor
M1	1	DC Motor
K1 K2	2	Relay SPDT
P1	1	15.399999999999999 , 5 Power Supply
S1	1	Slideswitch
R1	1	Photoresistor
R2	1	1 kΩ Resistor
L1 L2	2	Light bulb
GAS1	1	Gas Sensor
PIEZO1	1	Piezo
R3	1	5 kΩ Resistor

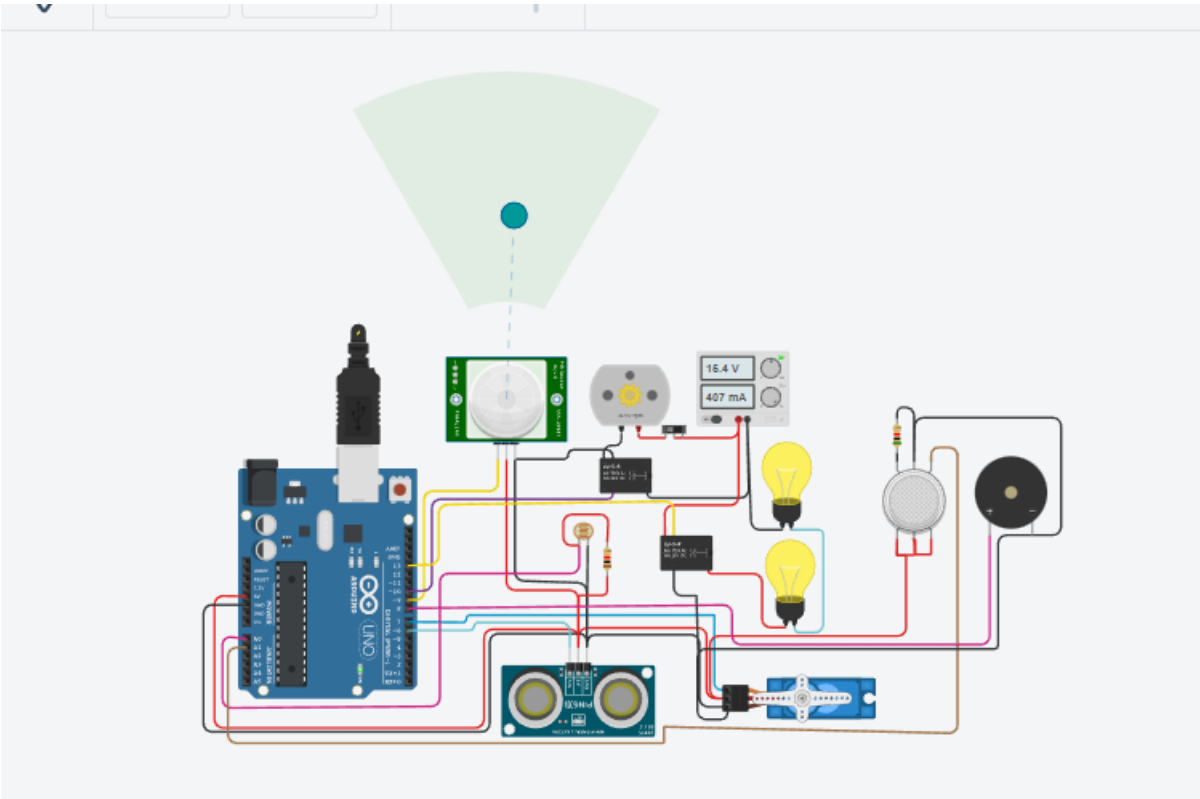
Ultrasonic sensor and Serve motor working:

The Ultrasonic sensor detects if a person is closer than 80 cm and opens the door for 5 seconds. Here, we have used Servo motor for simulation of door. After 5 seconds, the door will automatically close.



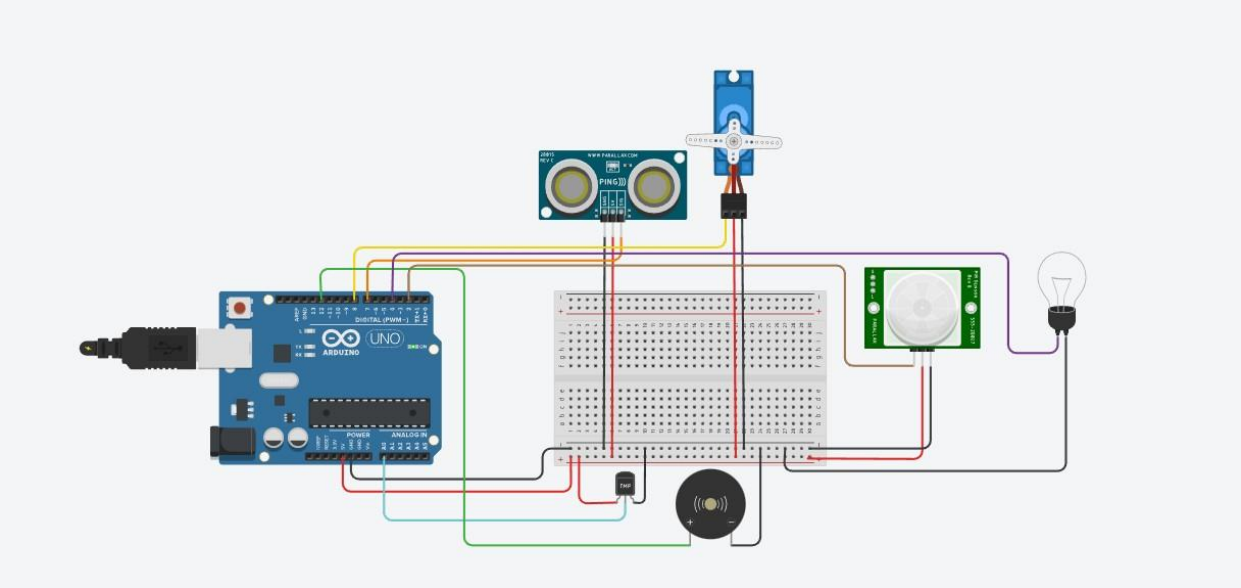
PIR sensor and Bulb working:

The PIR sensor can be fit in any room, if motion is detected then the light is turned on in that particular room. The light will turn off if there is no movement.



Smoke sensor and Buzzer working:

If the smoke is been detected,then the buzzer sound is turned on to alert the person.



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

readUltrasonicDist

```
ance(int triggerPin,
int echoPin)
{

pinMode(triggerPi
n, OUTPUT);  //
Clear the trigger

digitalWrite(trigger
Pin, LOW);

delayMicroseconds
(2);
// Sets the trigger
pin to HIGH state
for 10
microseconds

digitalWrite(trigger
Pin, HIGH);

delayMicroseconds
(10);

digitalWrite(trigger
Pin, 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,OUTPU
T);      //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_se
nsor);     //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 *
readUltrasonicDist
ance(6, 6);



  if (sen1Value <
100)
```

```
        {


        servo_7.writ
e(90);
   Serial.print("
          || Door
Open!  ; Distance =
");


Serial.print(sen1Va
lue);
  Serial.print("\n");



        }
  else
        {


        servo_7.writ
e(0);
   Serial.print("
          || Door
Closed! ; Distance
=  ");


Serial.print(sen1Va
lue);
```

```
Serial.print("\n");

  }

  delay(10); //
Delay a little bit to
improve simulation
performance

}
```