

IBM NALAIYA THIRAN

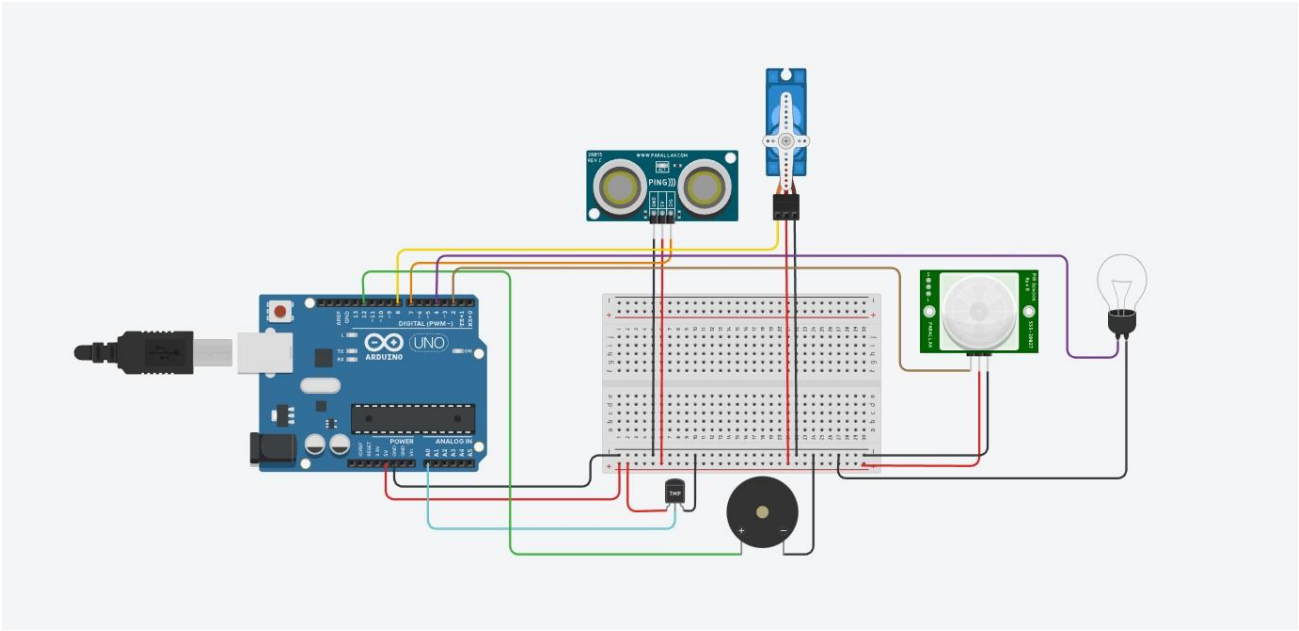
ASSIGNMENT – 1

Topic: Home Automation

Tinker cad Simulation Link:

<https://www.tinkercad.com/things/9eUiZ8aQOH8-exquisite-fyran/editel?sharecode=nqDGB0xjml9fwoFYoVJlrg-eL9NTtK2hIn3vY0AF1lo>

Circuit Design:



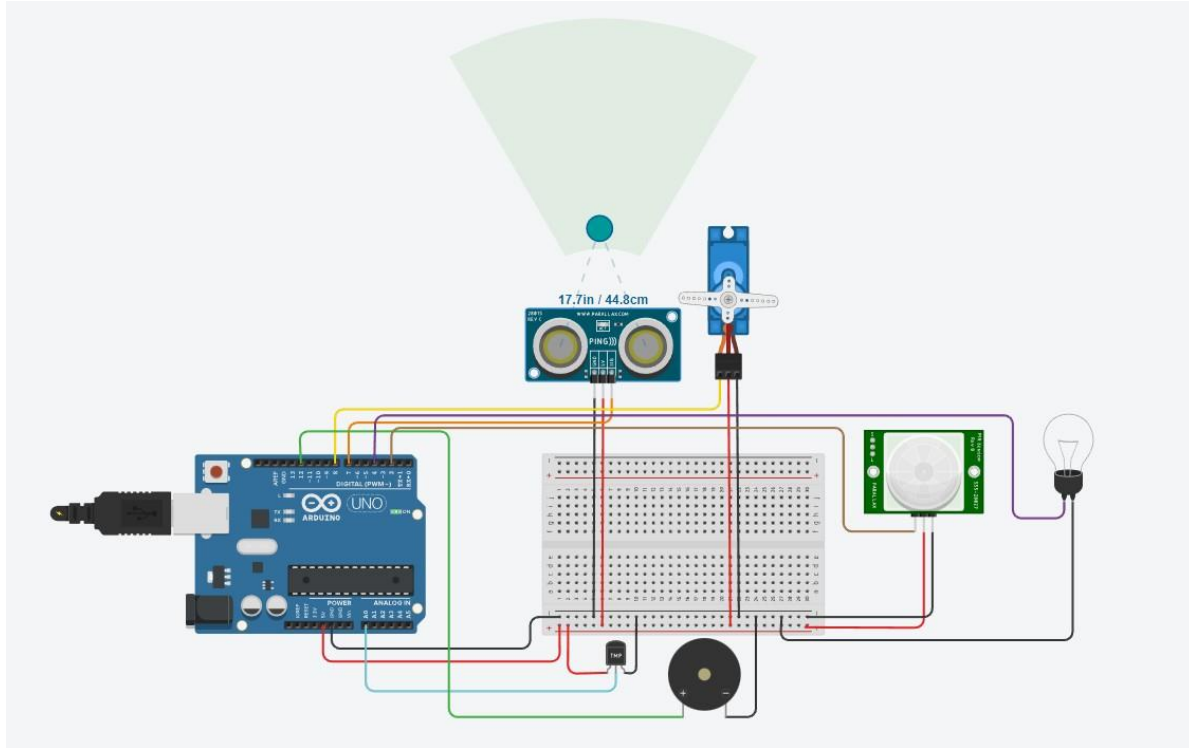
TINKERCAD IBM Assignment 1

Component List

Name	Quantity	Component
U3	1	Arduino Uno R3
PING2	1	Ultrasonic Distance Sensor
SERVO2	1	Positional Micro Servo
U4	1	Temperature Sensor [TMP36]
PIEZO2	1	Piezo
PIR2	1	-20.65912942617615 , -228.49647575865148 , -201.02371635141708 , -120.7146911147783 PIR Sensor
L2	1	Light bulb

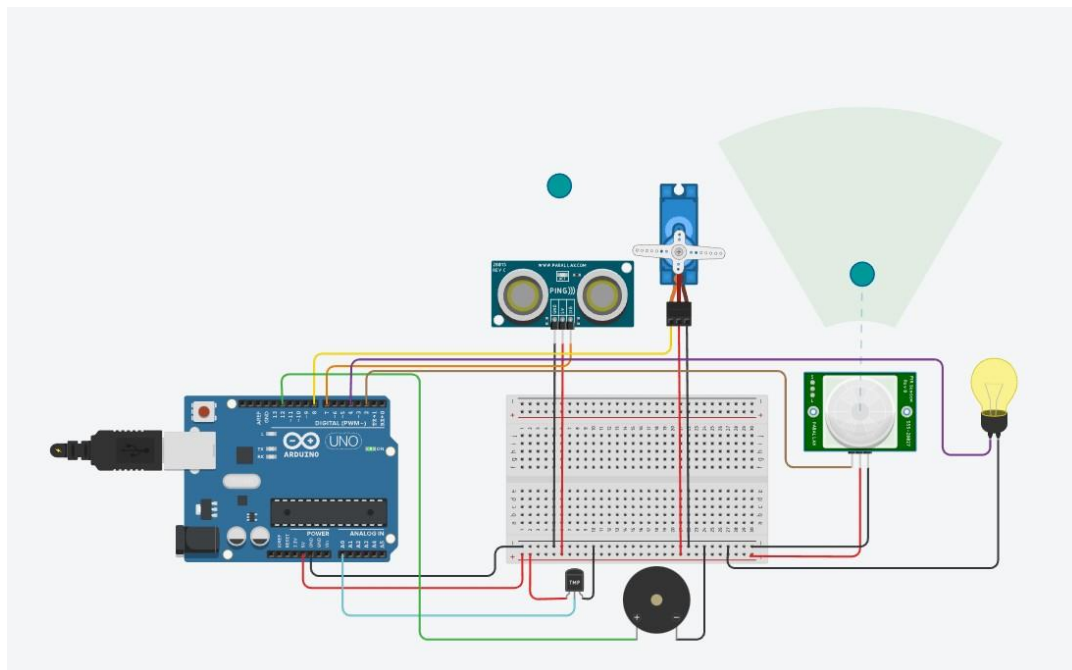
Ultrasonic sensor and Servo motor working:

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.



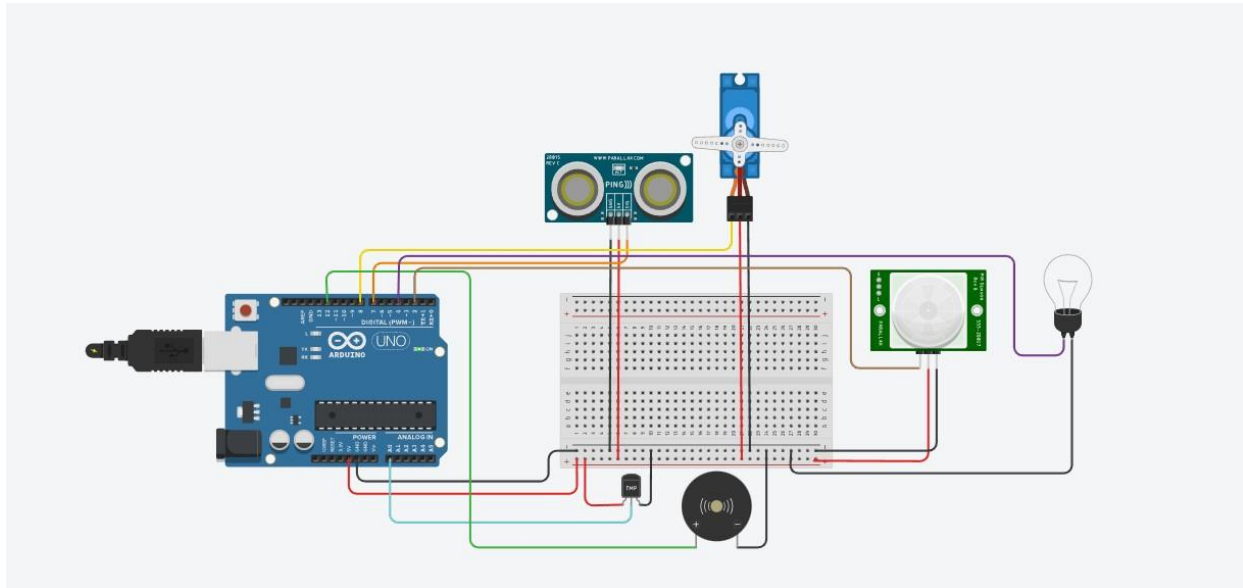
PIR sensor and Bulb working:

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.



Temperature sensor and Buzzer working:

The Temperature sensor will detect the temperature and if it is more than 50 degrees Celsius, then the buzzer sound is turned on to alert the person.

**Code:**

```
#include<Servo.h>

const int ultPin = 7;

int servoPin = 8;

Servo servo1;

void setup() {
  Serial.begin(9600);
  servo1.attach(servoPin);
  pinMode(2,INPUT);
  pinMode(4,OUTPUT);
  pinMode(12,OUTPUT);
  pinMode(A0,INPUT);
  digitalWrite(2,LOW);
```

```
}

void loop() {

    long duration, inches, cm;

    //Sending the initial signal to capture distance
    pinMode(ultPin, OUTPUT);
    digitalWrite(ultPin, LOW);
    delayMicroseconds(2);
    digitalWrite(ultPin, HIGH);
    delayMicroseconds(5);
    digitalWrite(ultPin, LOW);
    pinMode(ultPin, INPUT);
    duration = pulseIn(ultPin, HIGH);

    //Convert time into Distance
    cm = duration / 29 / 2;

    //Open the door for 5 seconds
    servo1.write(0);
    if(cm < 80)
    {
        servo1.write(90);
        delay(5000);
    }
    else
    {
        servo1.write(0);
```

```
}
```

```
//Read PIR sensor and turn on light based on motion
```

```
int pir = digitalRead(2);
```

```
if(pir == HIGH)
```

```
{
```

```
    digitalWrite(4,HIGH);
```

```
    delay(1000);
```

```
}
```

```
else if(pir == LOW)
```

```
{
```

```
    digitalWrite(4,LOW);
```

```
}
```

```
//Read Temperature and alert if the threshold exceeds using buzzer
```

```
float value=analogRead(A0);
```

```
float temperature=value*0.48;
```

```
if(temperature > 80)
```

```
{
```

```
    digitalWrite(12,HIGH);
```

```
}
```

```
else
```

```
{
```

```
    digitalWrite(12,LOW);
```

```
}
```

```
}
```