

# SMART HOME WITH SENSORS USING TINKERCAD

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“Home automation” refers to the automatic and electronic control of household features, activity, and appliances. In simple terms, it means you can easily control the utilities and features of your home via the Internet to make life more convenient and secure, and even spend less on household bills.

There are 3 main elements of a home automation system: sensors, controllers, actuators.

- Sensors can monitor changes in daylight, temperature, or motion detection. Home automation systems can then adjust those settings (and more) to your preferences.
- Controllers refer to the devices — personal computers, tablets or smartphones — used to send and receive messages about the status of automated features in your home.
- Actuators may be light switches, motors, or motorized valves that control the actual mechanism, or function, of a home automation system. They are programmed to be activated by a remote command from a controller.

We have used :

- An **Ultrasonic Sensor** for measuring distance (threshold= 40cm) and Servo motor for opening the door.
- If the room detects any movement, the light (LED) will automatically be lighting. If there is no movement in the room, then the light will remain off. We use a **PIR** for detecting movement and LED as a light source.
- The temperature sensor will detect the room temperature and if that is greater than 20 (degree Celsius) then a fan will be running, otherwise, the fan will remain stopped. (we use a **temperature sensor LM35** for detecting temperature and a motor for running a fan).

## **CODE:**

```
#include<Servo.h>
const int pingPin = 7;
int servoPin = 8;

Servo servo1;

void setup() {
  Serial.begin(9600);
  servo1.attach(servoPin);
  pinMode(2,INPUT);
  pinMode(4,OUTPUT);
  pinMode(11,OUTPUT);
  pinMode(12,OUTPUT);
  pinMode(13,OUTPUT);
  pinMode(A0,INPUT);
  digitalWrite(2,LOW);
  digitalWrite(11,HIGH);
}

void loop() {

  long duration, inches, cm;

  pinMode(pingPin, OUTPUT);
  digitalWrite(pingPin, LOW);
  delayMicroseconds(2);
  digitalWrite(pingPin, HIGH);
  delayMicroseconds(5);
  digitalWrite(pingPin, LOW);
  pinMode(pingPin, INPUT);
  duration = pulseIn(pingPin, HIGH);

  inches = microsecondsToInches(duration);
  cm = microsecondsToCentimeters(duration);

  servo1.write(0);

  if(cm < 40)
  {
    servo1.write(90);
```

```

    delay(2000);
}
else
{
    servo1.write(0);
}
int pir = digitalRead(2);

if(pir == HIGH)
{
    digitalWrite(4,HIGH);
    delay(1000);
}
else if(pir == LOW)
{
    digitalWrite(4,LOW);
}

float value=analogRead(A0);
float temperature=value*0.48;

Serial.println("temperature");
Serial.println(temperature);

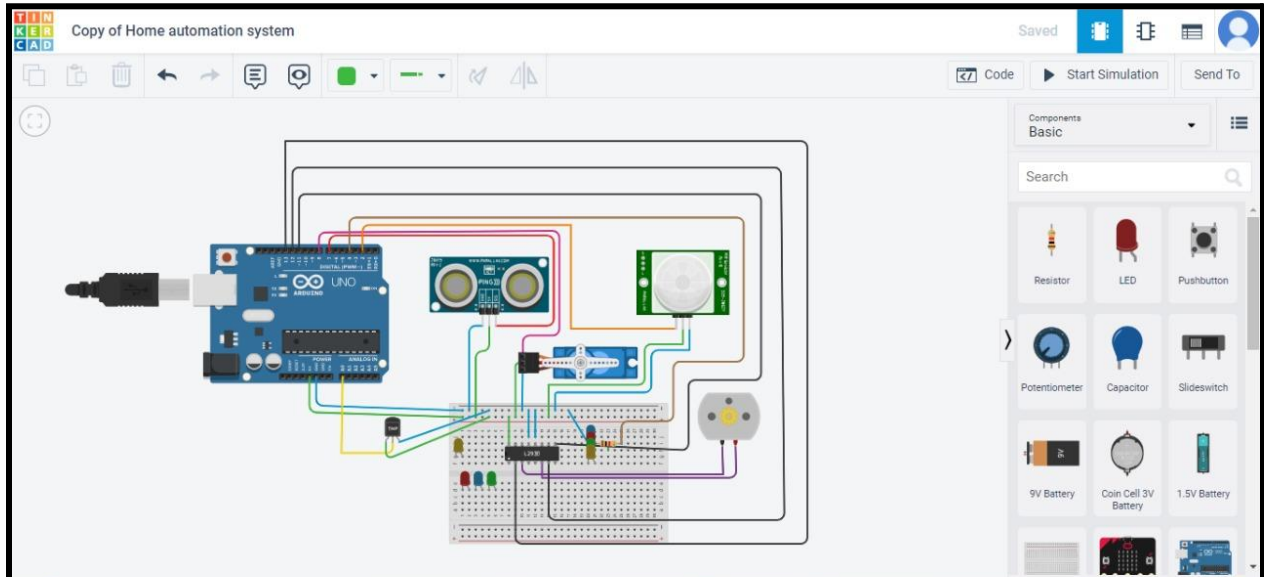
if(temperature > 20)
{
    digitalWrite(12,HIGH);
    digitalWrite(13,LOW);
}
else
{
    digitalWrite(12,LOW);
    digitalWrite(13,LOW);
}
}

long microsecondsToInches(long microseconds) {
    return microseconds / 74 / 2;
}

long microsecondsToCentimeters(long microseconds) {
    return microseconds / 29 / 2;
}

```

## BEFORE SIMULATION:



## AFTER SIMULATION:

