



END SEMESTER ASSESSMENT (ESA)  
B.TECH. (CSE)  
IV SEMESTER

UE18CS256 – MICROPROCESSOR AND COMPUTER  
ARCHITECTURE LABORATORY

PROJECT REPORT  
ON  
**Home Automation using Arduino**

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## **ABSTRACT OF THE PROJECT:**

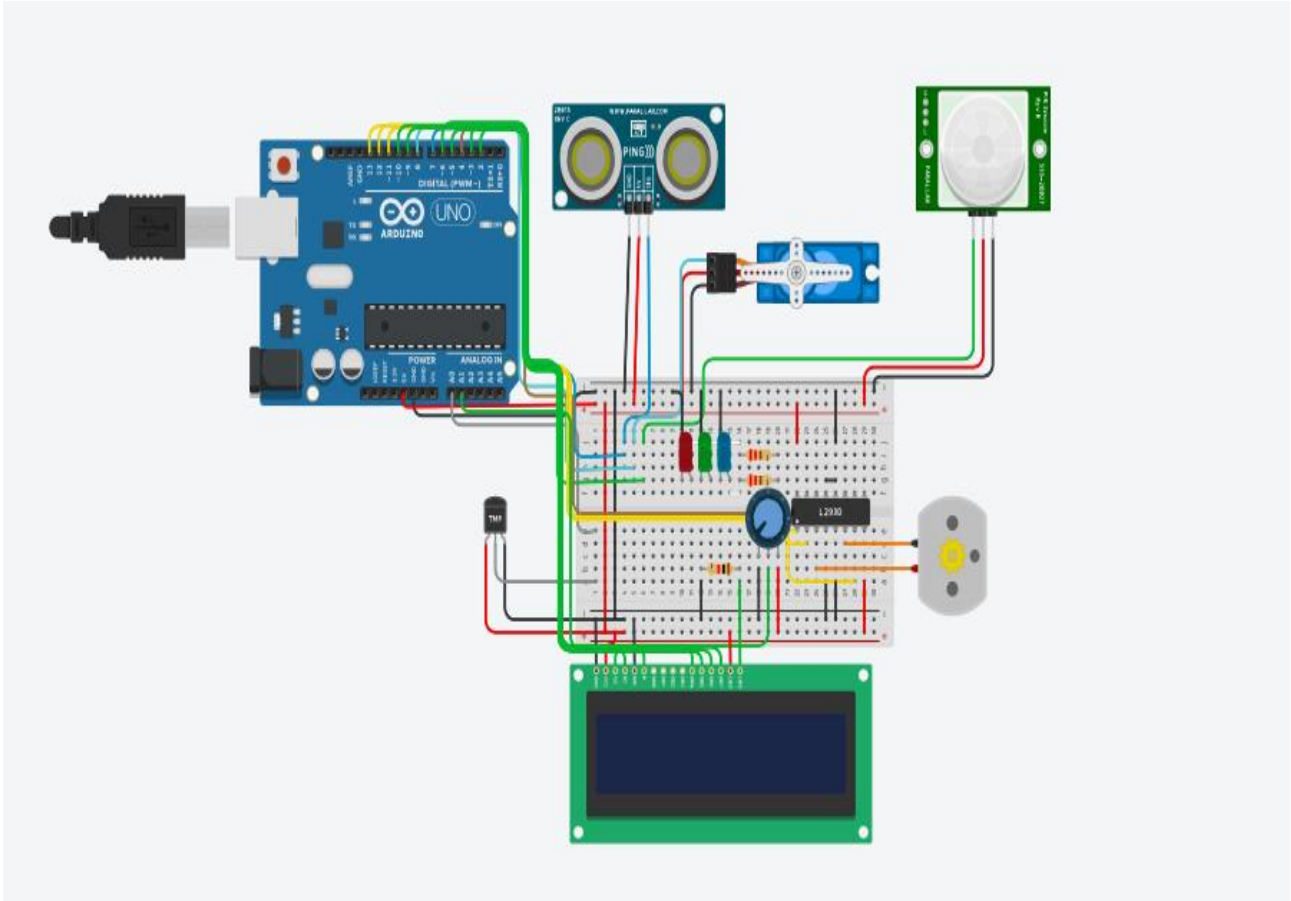
Home automation or smart home industry have seen dramatic growth in past years and will continue to in future as per the market requirements and it benefits. In this project we have tried to develop a home automation system or a smart home.

A home automation system designed with the following features:

- The door opens if anyone comes within 40 cm of it, and stays open for 2 seconds. If the person is still standing near the door, it will remain open for another 2 seconds or close. An ultrasonic sensor is used to measure the distance and a servo motor is used to open or close the door.
- If any movement is detected in the room, the LEDs will light up. Here, PIR is used to detect movement.
- Room temperature is calculated and if it is greater than 20 degree Celsius, a fan will be switched on and be running. Otherwise, it's switched off.

The status of any of the above is displayed on the LCD Screen.

## CIRCUIT DIAGRAM:



## ARDUINO CODE:

```
#include<Servo.h>
#include<LiquidCrystal.h>
LiquidCrystal lcd(A1,10,9,6,5,3);
float value;
int tmp = A0;
const int pingPin = 7;
int servoPin = 8;
```

```
Servo servo1;
void setup()
{
  Serial.begin(9600);
  servo1.attach(servoPin);
  lcd.begin(16, 2);
  pinMode(2,INPUT);
  pinMode(4,OUTPUT);
  pinMode(11,OUTPUT);
```

```
  pinMode(12,OUTPUT);
  pinMode(13,OUTPUT);
  pinMode(A0,INPUT);
  digitalWrite(2,LOW);
  digitalWrite(11,HIGH);
  digitalWrite(3,OUTPUT);
  digitalWrite(7,OUTPUT);
  digitalWrite(11,OUTPUT);
  digitalWrite(13,OUTPUT);
}
```

```
void loop()
{
```

```
  long duration, inches, cm;
```

```
  pinMode(pingPin, OUTPUT);
  digitalWrite(pingPin, LOW);
```

```
delayMicroseconds(2);  
digitalWrite(pingPin, HIGH);  
delayMicroseconds(5);  
digitalWrite(pingPin, LOW);
```

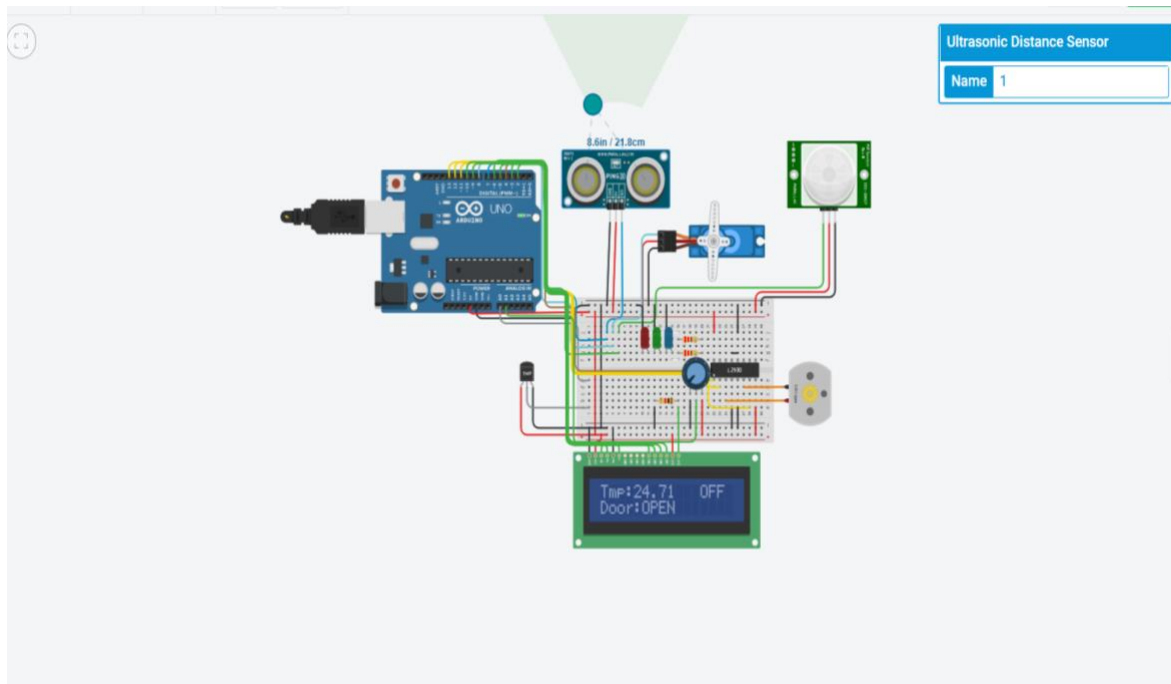
```
pinMode(pingPin, INPUT);  
duration = pulseIn(pingPin, HIGH);
```

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

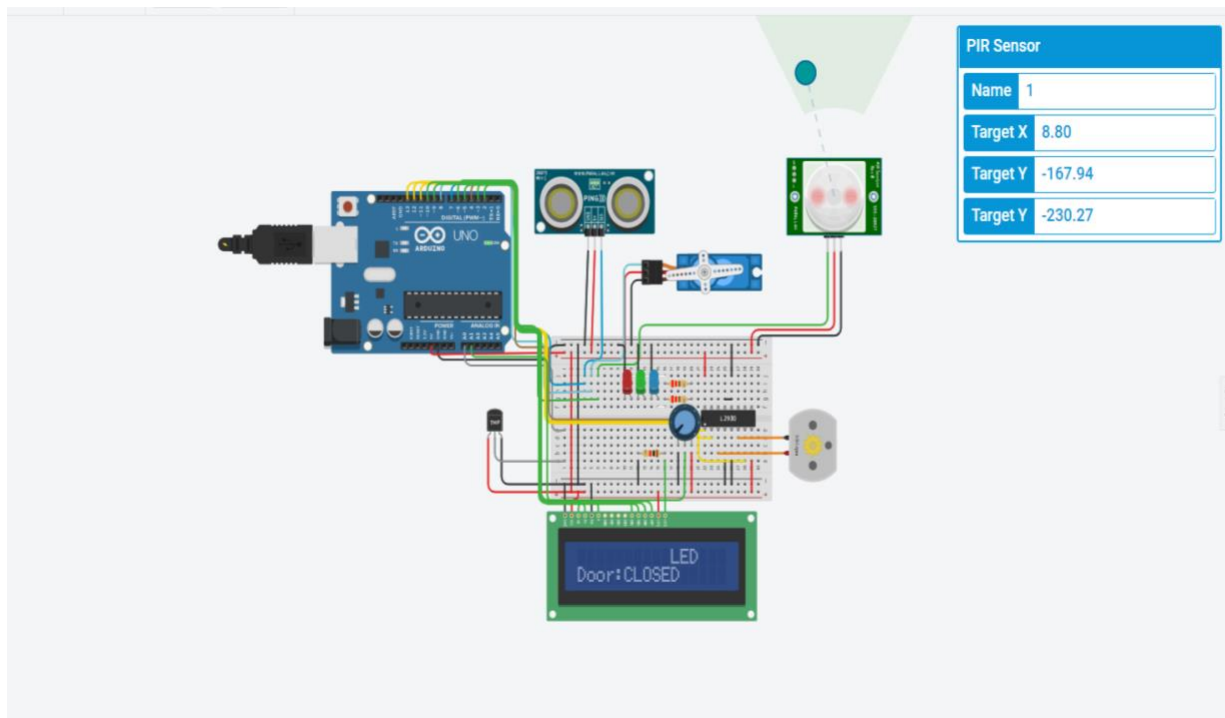
```
servo1.write(0);
```

```
if(cm < 40)  
{  
    servo1.write(90);  
    lcd.setCursor(0,1);  
    lcd.print("Door:OPEN");  
  
}  
else  
{  
    servo1.write(0);  
    lcd.setCursor(0,1);  
    lcd.print("Door:CLOSED");  
  
}
```

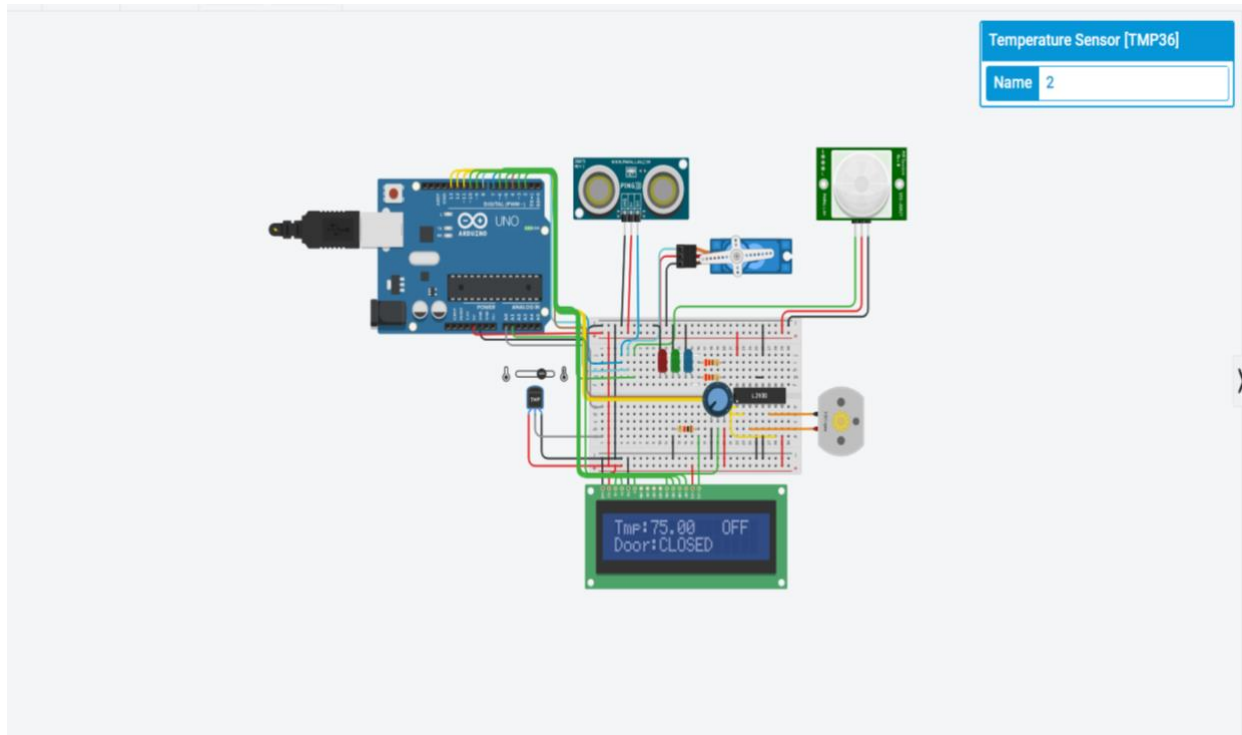
## SCREEN SHOTS OF THE OUTPUT:



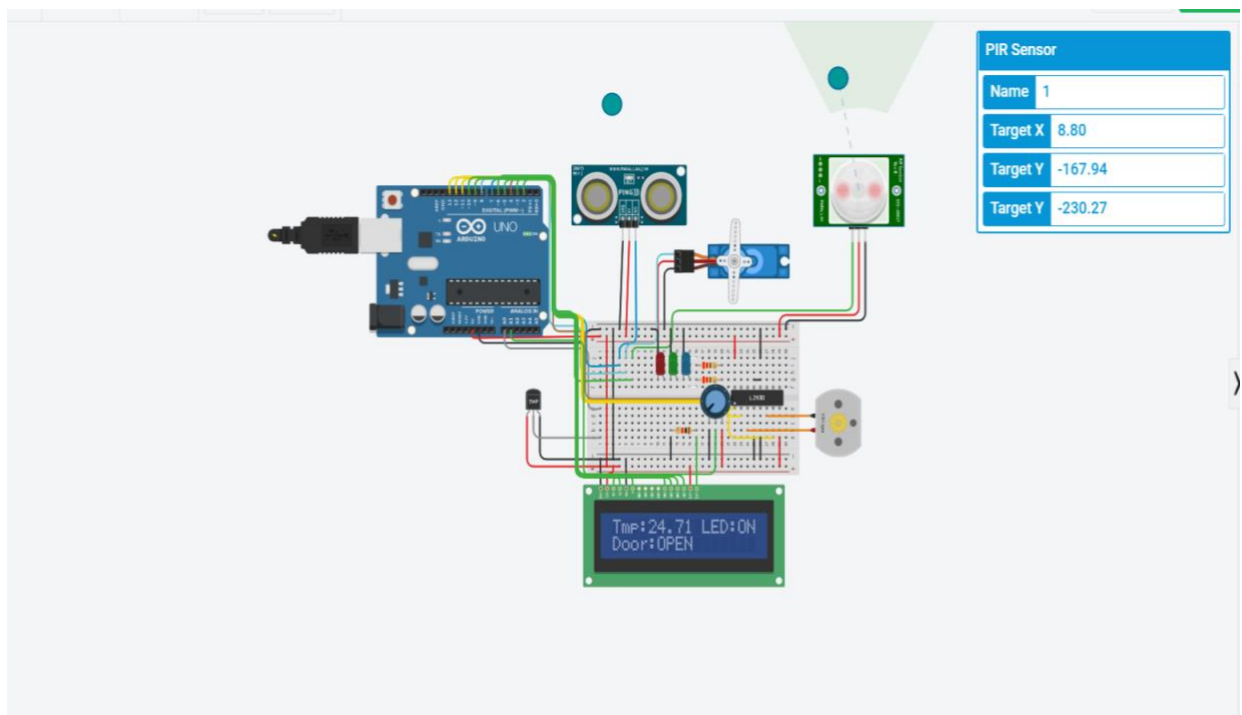
We can see that the door opens since the distance is less than 40cm.



The PIR sensor detects the movement and hence the LED's are glowing.



The fan starts moving as the temperature is above 20 degrees Celsius.



We can see that the status of all the sensors is displayed on the LCD.



## REFERENCES

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- <https://www.tinkercad.com/things/cVd15n3xCu>  
[d-arduino-with-lcd-interface](https://www.tinkercad.com/things/cVd15n3xCu)
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[W-temperature-sensor-display-with-lcd-in-arduino](https://www.tinkercad.com/things/iovuycemCB)
- <https://www.theengineeringprojects.com/2018/06/introduction-to-arduino-uno.html>