TECHNOLOGICAL INSTITUTE OF THE PHILIPPINES

938 Aurora Blvd, Cubao, Quezon City, 1109 Metro Manila

MODERN HOME AUTOMATION SYSTEM

SUBMITTED TO:

Engr. Ryan Francisco

SUBMITTED BY:

Diones, Cedrick (Leader)

Caborda, Justine

Cagna-an, John Albert B.

DATE

Dec 16 2022

MODERN HOME AUTOMATION SYSTEM

Introduction

The project, Title Modern Home Automation System, starts with a basic idea. It minimizes human effort. The electrical energy can be used efficiently, and it can be saved for future needs. The whole system works in an efficient way such that it is cost-effective and eco-friendly. With this Modern Home Automation System, home appliances like fan and doors can be modernized and automized.

The purpose of this system is the availability of electrical energy due to the drastic depletion of conventional fuel resources. The current problem is due to the shortage of fuel resources predicted to run out this century. That is why fuel resource prices keep increasing due to the loss of resources worldwide, and renewable energy is not popular enough.

There is an existing system, but the difference is that our system has a gas sensor that can detect the damage caused by fire, which will sound an alarm using a buzzer. And also use the temperature sensor in the room to check the temperature, and the temperature sensor detects a fire.

By using sensors and motors, home automation is formed. It concentrates on the main door, security, and fan system. Sensors like Ultrasonic distance sensors, PIR sensors, temperature sensors, and Gas sensors are used in this home automation system. The whole system works by checking a movement, temperature, and alarm. This home automation system uses motors like the Servo motor and DC motor and for alarm uses Piezo.

Objectives

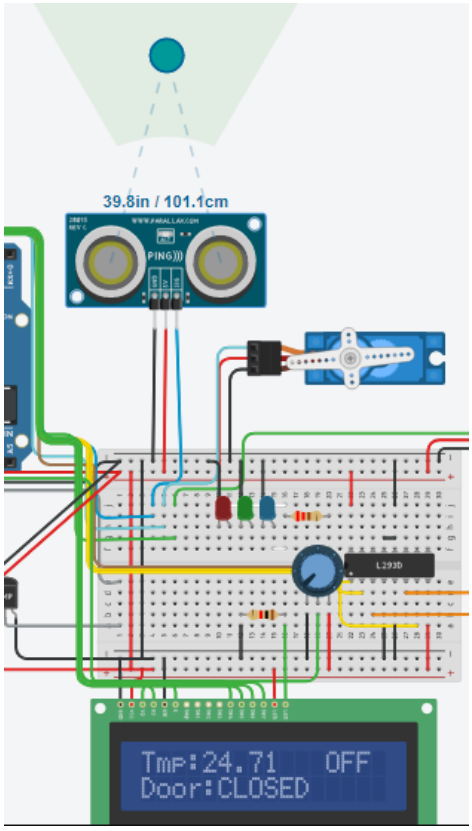
When you automate your home, you'll save a lot of time and work. People who have innovative home products will be more efficient at work. Because they kept more, they would also have more cash on hand. Home automation systems can help make the economy more robust by making people's jobs easier.

- Maximizing home security
- Increased energy efficiency
- Improved appliance functionality
- Home management insights

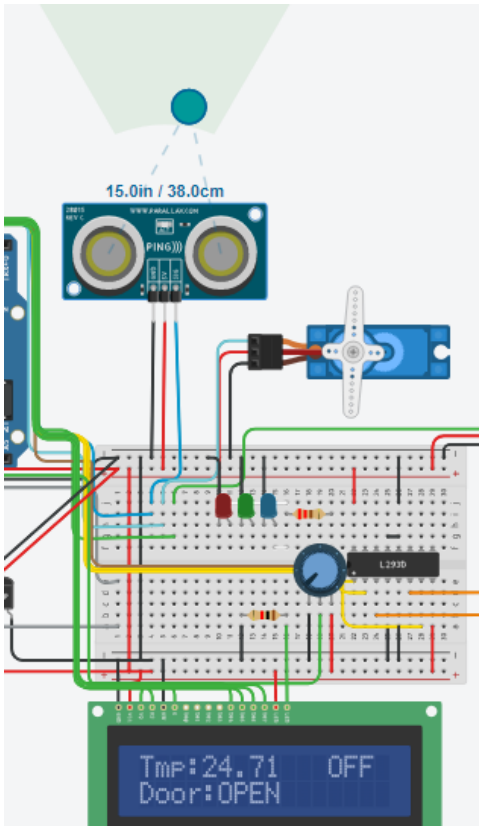
Features/Capabilities

- **Door System** – It detects the movement; if the person is nearing a door that is 40cm, the door will automatically open, and it opens only in 2 seconds. After 2 seconds, the door automatically closes. DC servo motor plays a significant role in opening and closing the doors. The Servo motor will rotate to a 90-degree angle when the door is OPEN, then 0-degree angle when it is CLOSED

Closed Door

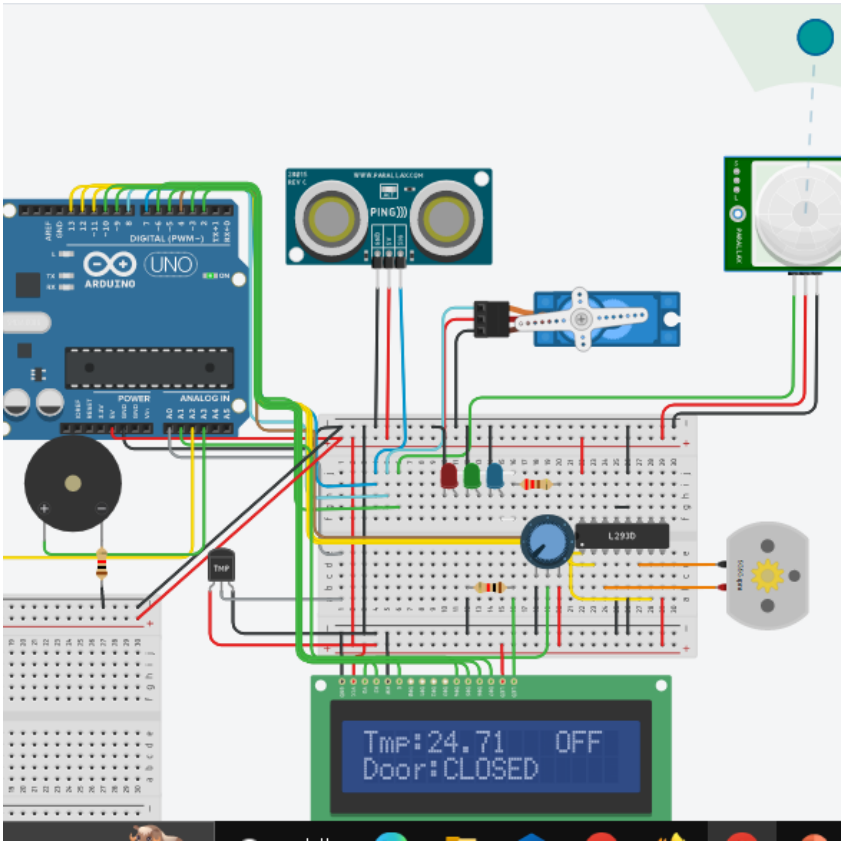


Open Door

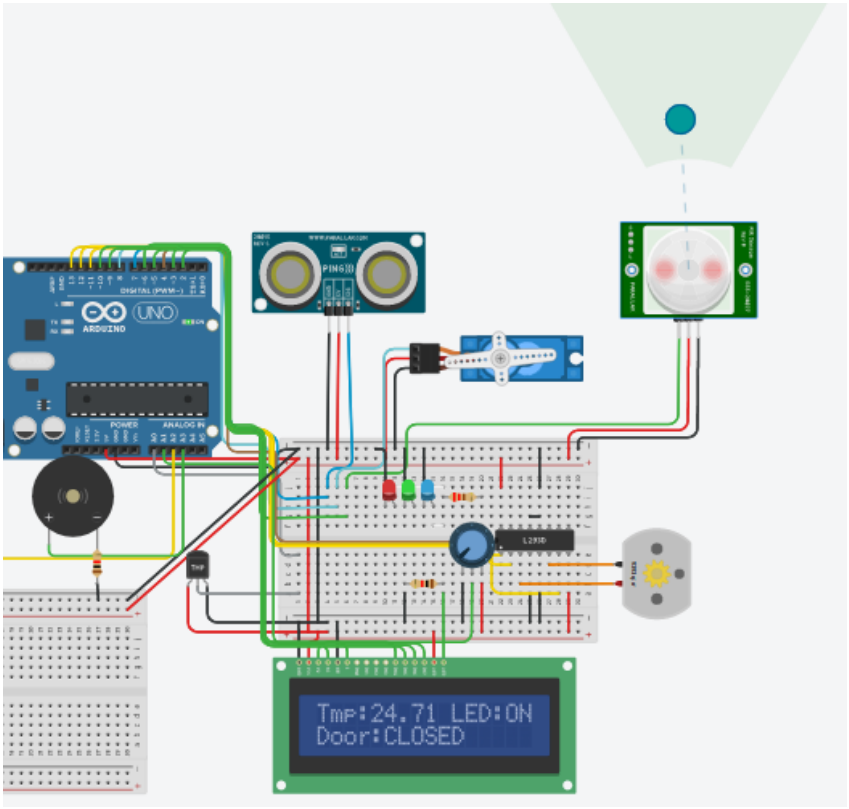


- **Security System** – It sensed if something moved at the location. When a person is within the PIR sensor's range, it will signal LEDs to light and buzz using Piezo. If there is no movement, the light automatically stops working, and the buzz also stops.

No Movement

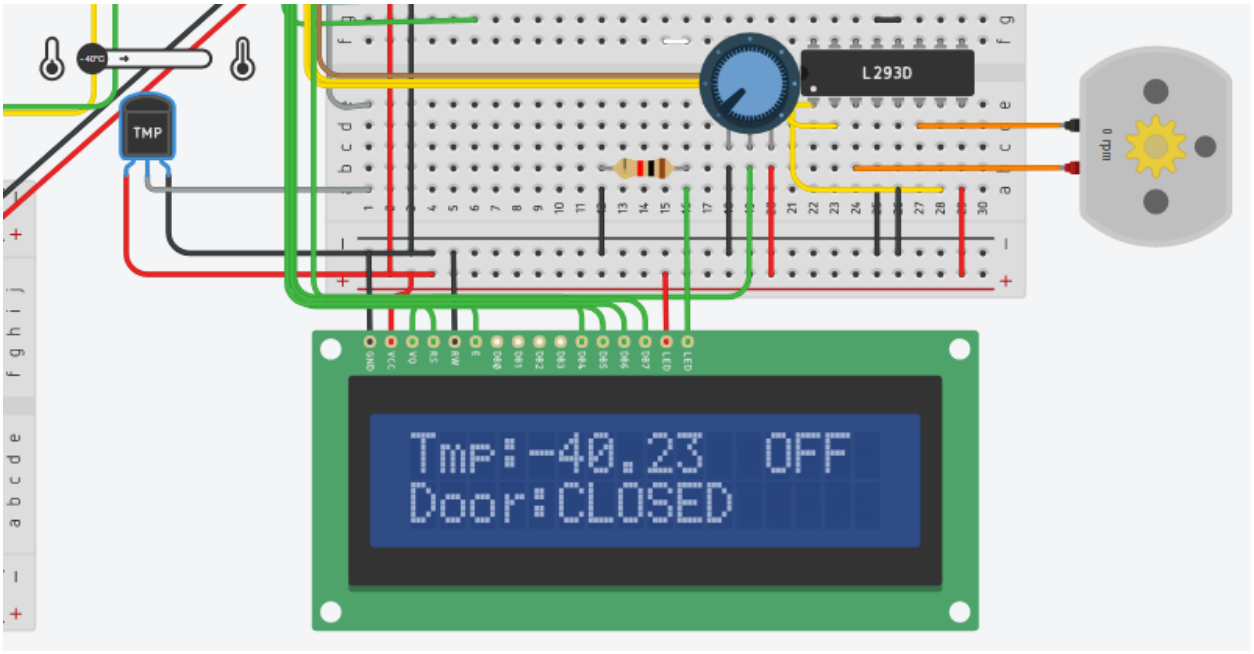


Movement Detected

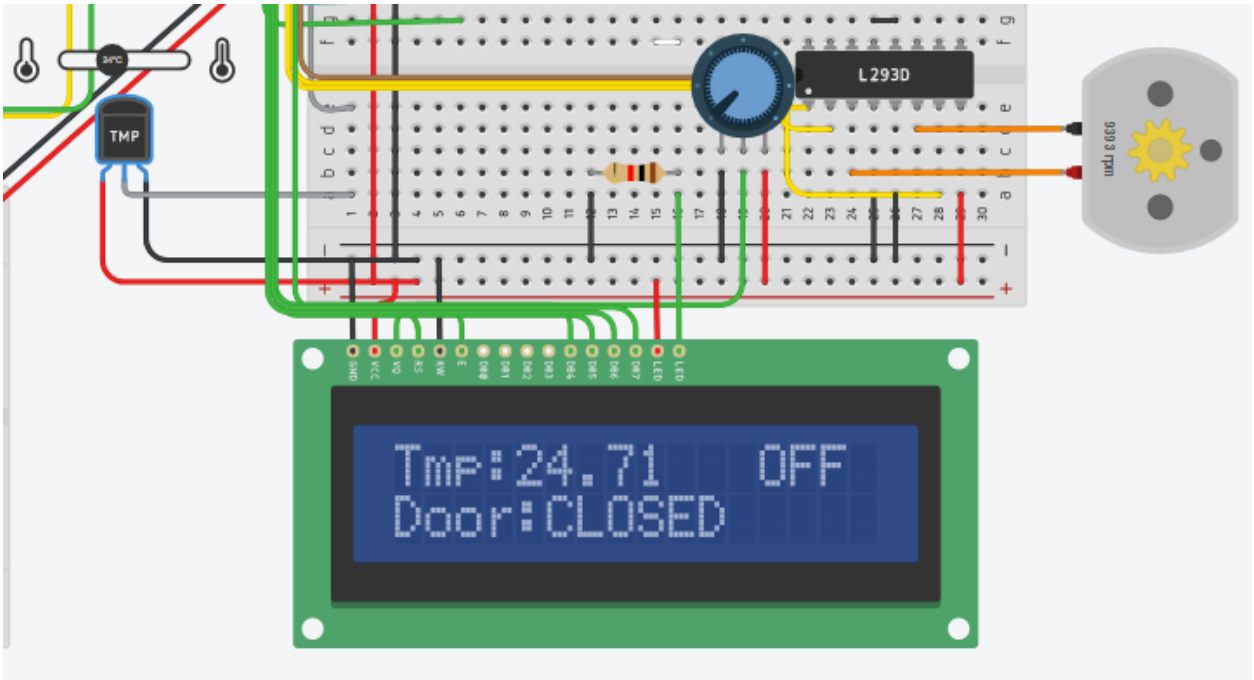


- **Fan System** – It is received from the temperature sensor. It mainly works based on room temperature. The temperature sensor deducts the room temperature. If the room temperature exceeds 20 degrees Celsius, the fan starts working in 2 seconds, and the temperature sensor controls the speed. If the temperature is below the level, it stops working. DC motors are used in the functioning of the fans.

Closed Fan

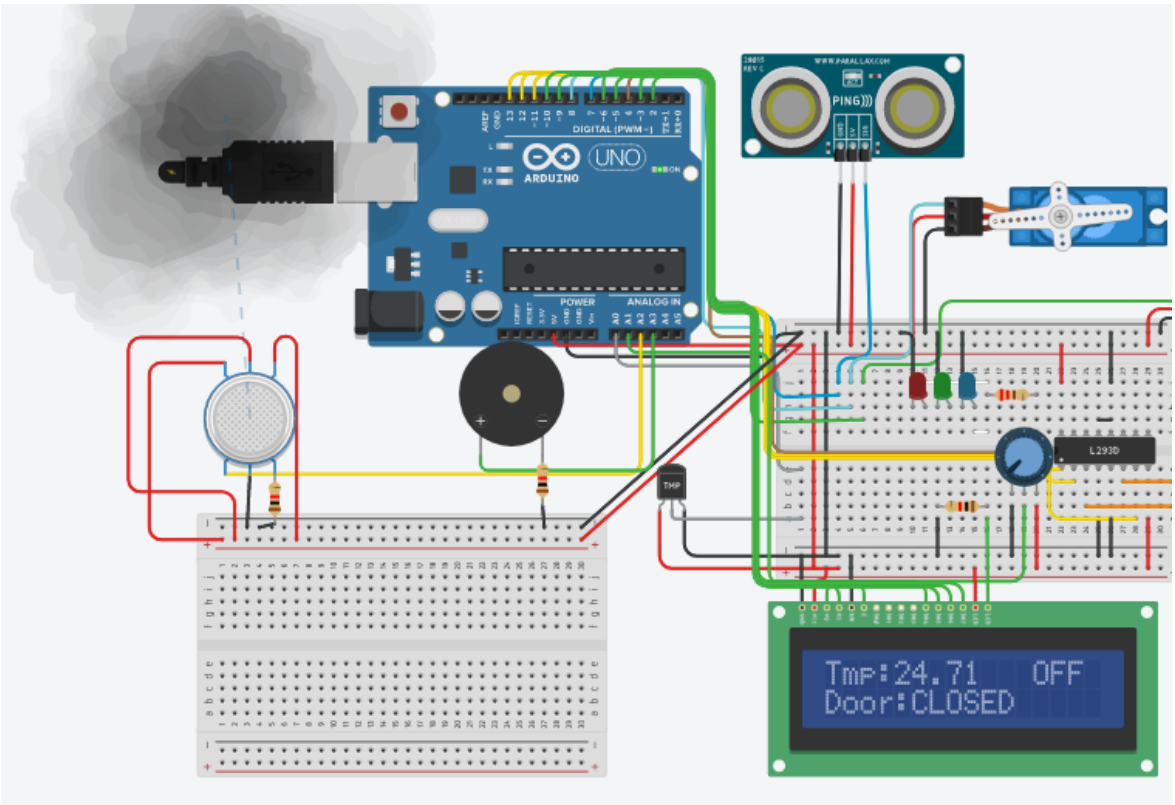


Open Fan

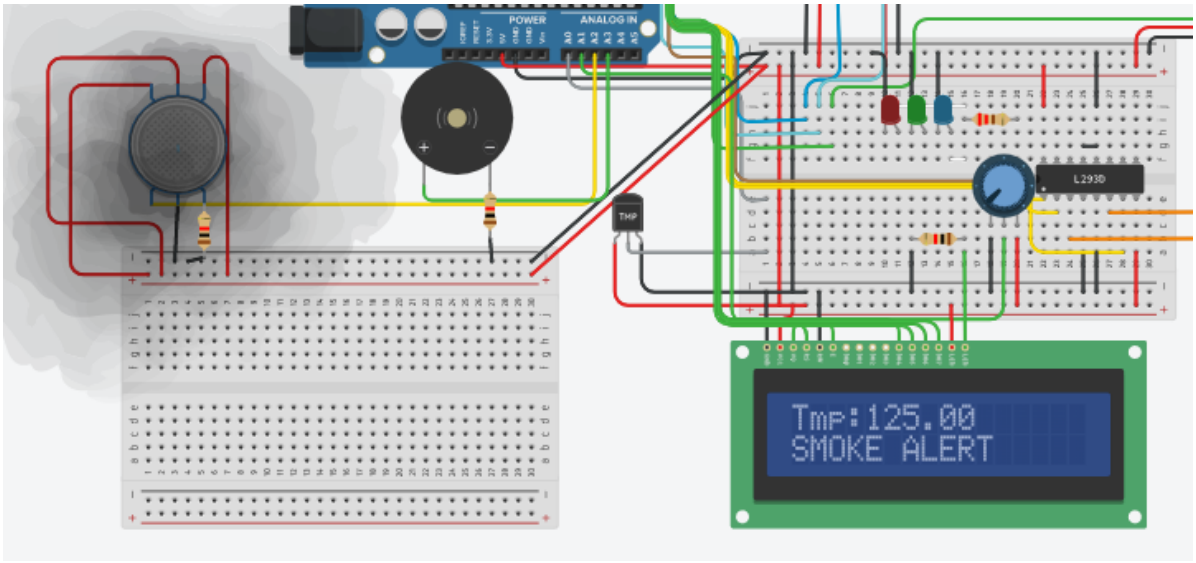


- **Fire Alarm System** – It will buzz in 1 second using piezo when a certain amount of smoke is detected. When the temperature is within 125 degrees Celsius, a cloud of smoke/fire is noticed.

Smoke not Detected



Smoke Detected


POWER
ANALOG IN
L293D
TMP
Tmp:125.00
SMOKE ALERT

Limitations

In this system “Modern Home Automation System,” An automated house needs a consistent, uninterrupted power source for all of its devices. Ensure power outages or fluctuations do not impact your home before installing the home automation devices. These conditions might harm appliances or even put your home on lockdown. Because it can disturb some residents, a smoke sensor cannot be installed within the kitchen. For instance, when you are cooking, the smoke that comes from the pan will instantly set off the smoke sensor's alarm.

The door system will detect if the person is nearing a door that is 40cm, the door will automatically open, and it opens only in 2 seconds. After 2 seconds, the door automatically closes. The temperature sensor is attached to the fan system, which turns on when the temperature reaches 20 degrees or higher and off when it descends to 19 degrees or lower.

Discussion/ Other Information

Our Modern Home Automation System can offer various efficiencies throughout different parts of your home. They can also help you save money on long-term energy costs. Modern home automation systems can add to your home's security, increase energy efficiency, and improve appliance functionality and home management.

Our Modern Home Automation System will lessen our daily activities and make life more convenient. Also, the benefits of our systems include safety, control, comfort, and energy savings.

This system is to make homes simpler, better, or more accessible. Every aspect of the house can be automated. Moreover, it can also provide security automation within the household. This system can also maximize home security, increase energy efficiency, and improve appliance functionality and home management. The main goal is to conserve electrical energy to avoid electricity waste and leakage. Implementing this system will help electrical power be used efficiently, save energy, be cost-effective and eco-friendly, and save it for future needs.

It makes the user's life easier by reducing their time on routine tasks. In addition, it can make life easier for those with disabilities by turning on the lights when they enter a room. Specifically, security concerns arise when you can remotely control items such as home entrances and fire alarms.

Conclusion

Therefore, we conclude that our proposal demonstrates an automation system that contains a door system, a security system, a fan system, and a fire alarm system. Modern home automation systems are becoming more sophisticated as technology develops. Newer homes are replacing their wall switches with a central control panel. At present, it is inconvenient to physically approach standard wall switches installed at various points throughout the home to turn them on or off. This challenge is compounded for the elderly and the physically impaired.

As a result of the time, effort, and cost savings gained by automation, as well as the mistake reduction afforded by its use, a corporation can devote more resources to its core missions. Time spent on repetitive activities can be reduced. Moreover, adaptive control and machine learning algorithms could be employed to manage sensor values automatically, such as those from sensors for determining distance, intrusion, temperature, and gas. In addition, the optimization of the switching of appliance modes for energy savings could be improved in the future by applying machine learning techniques to learn from the homeowner's behavior. In addition, the information sent from the sensors is tracked in case abnormalities are detected, such as a gas leak or an increase in temperature due to a fire. If no one were home, the machine would enter safe mode and emit a warning signal that would be relayed to the website and the special authorities. Utilizing this technology increases security and comfort while lowering costs.

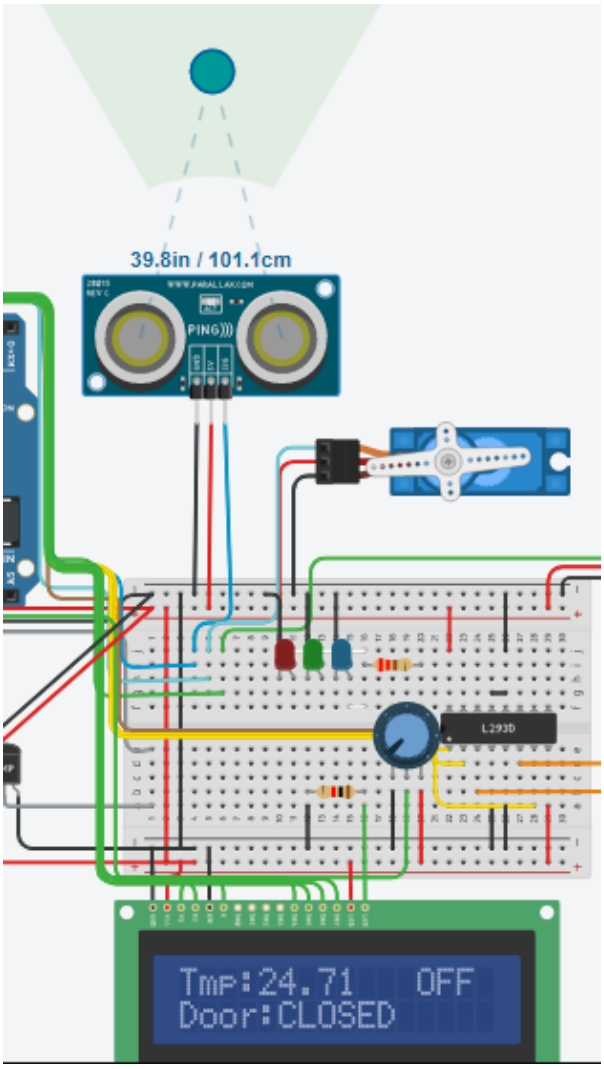
Tinkercad Link:

https://www.tinkercad.com/things/ccPReo8s0hc-grp7modern-home-automation-system/editel?sharecode=zhcisjgkmH-HOaqB1XI6SUac-T5kINCepSb_qgD5n90

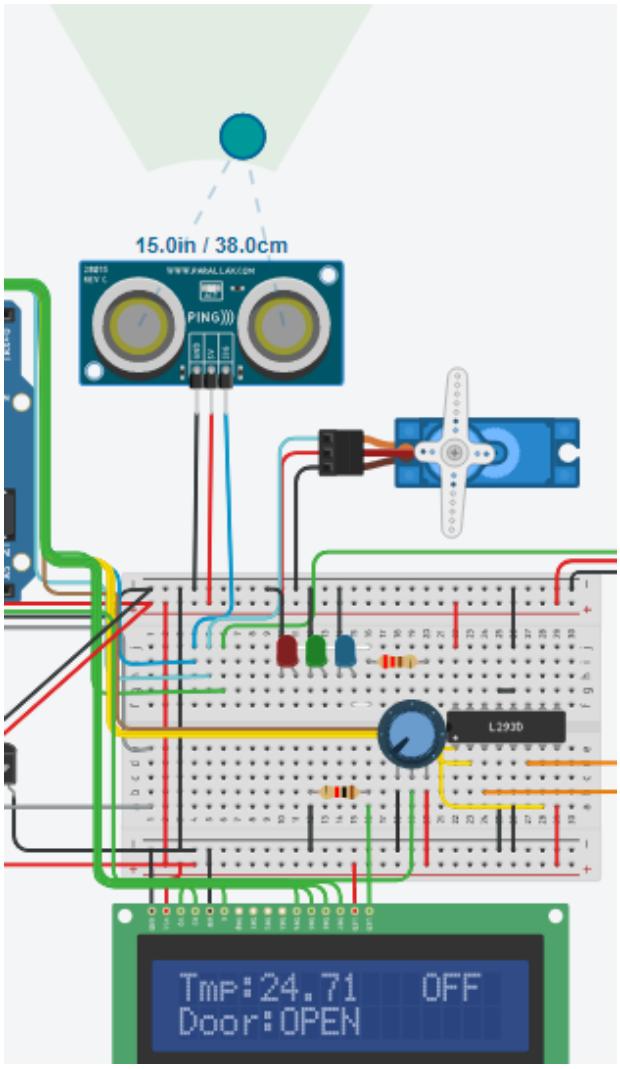
Screenshot Output:

Door System:

Closed Door

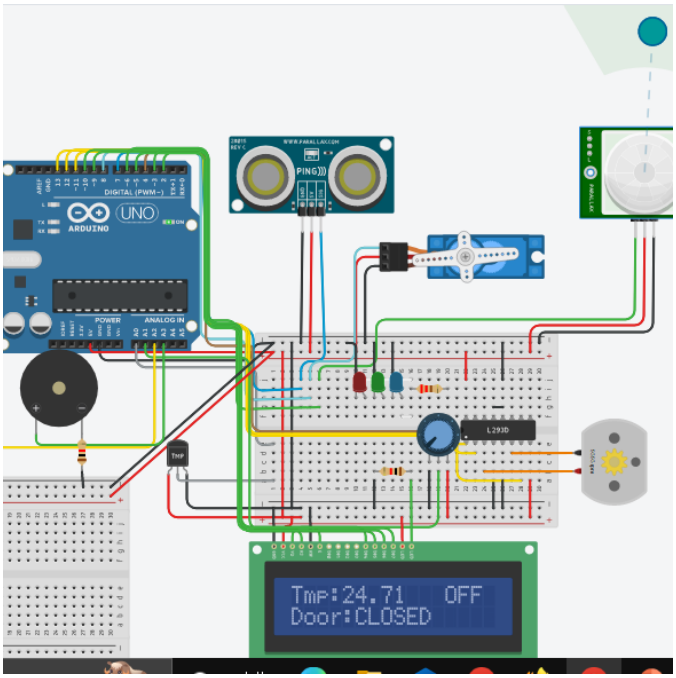


Open Door

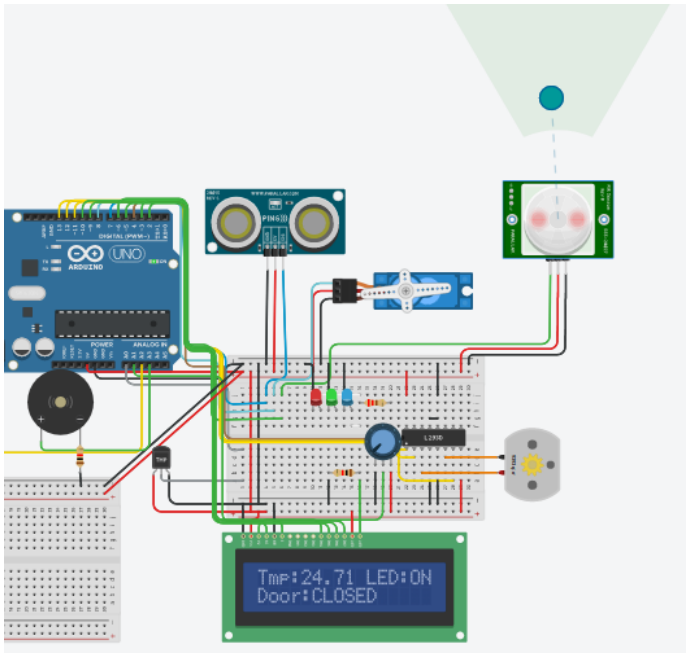


Security System:

No Movement

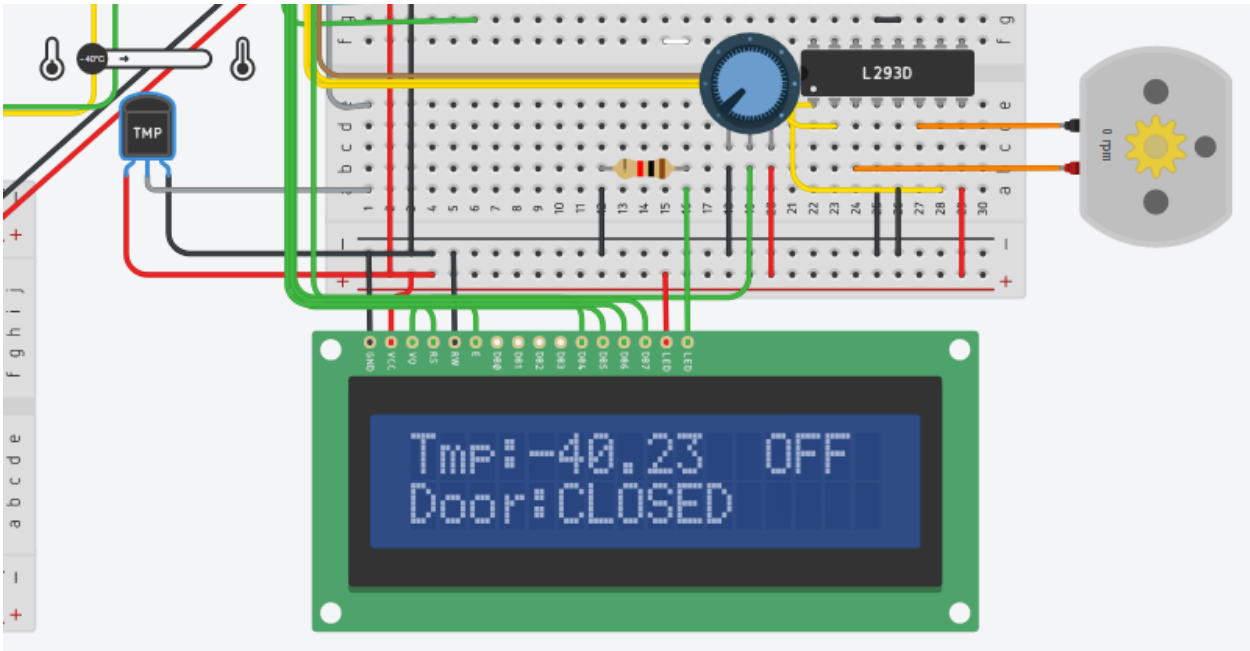


Movement Detected

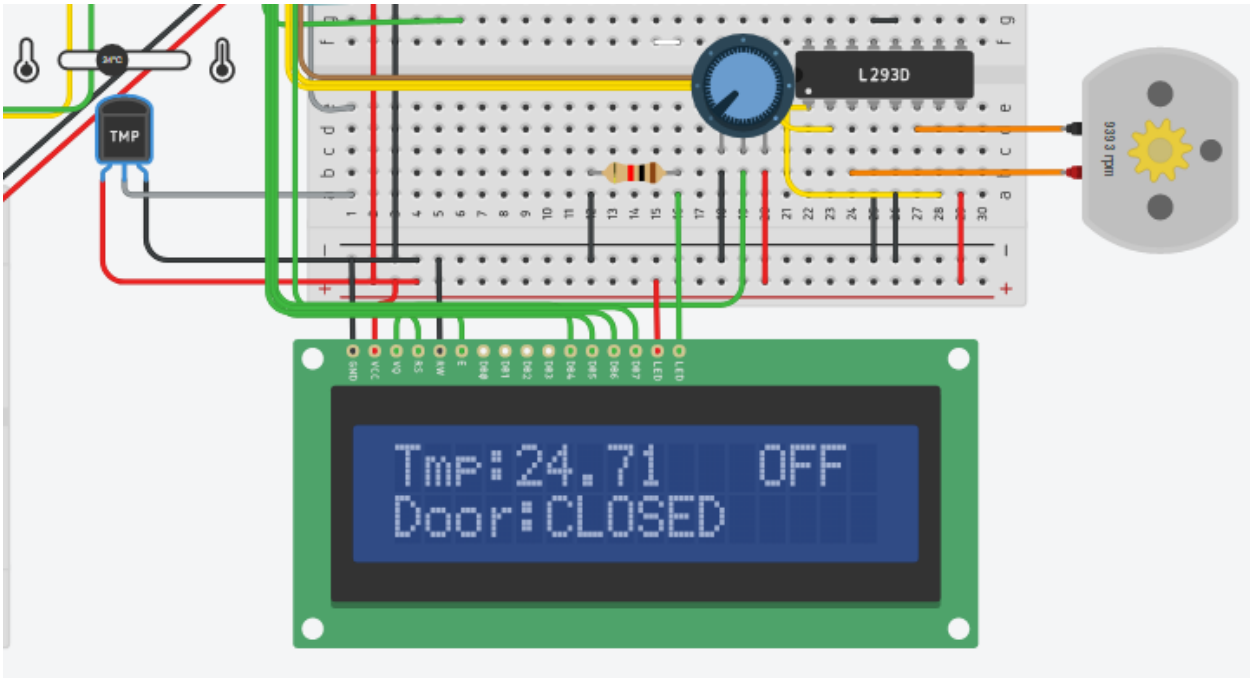


Fan System:

Closed Fan

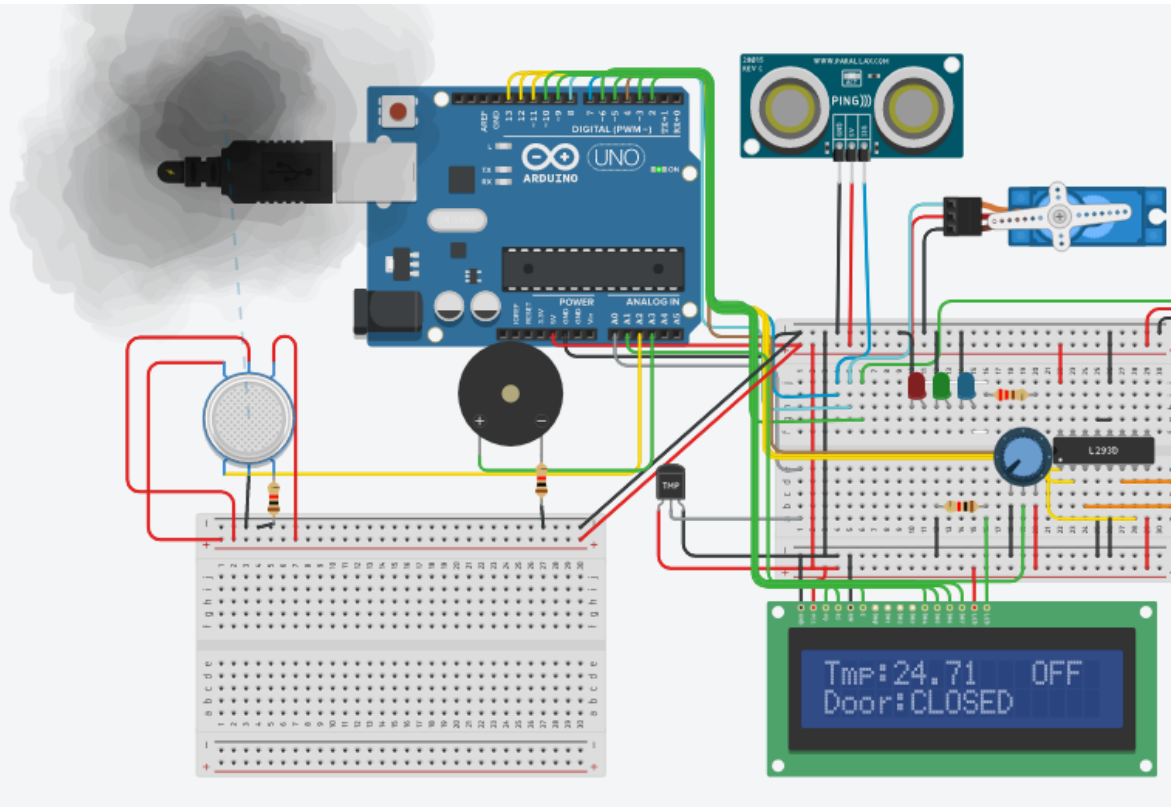


Open Fan

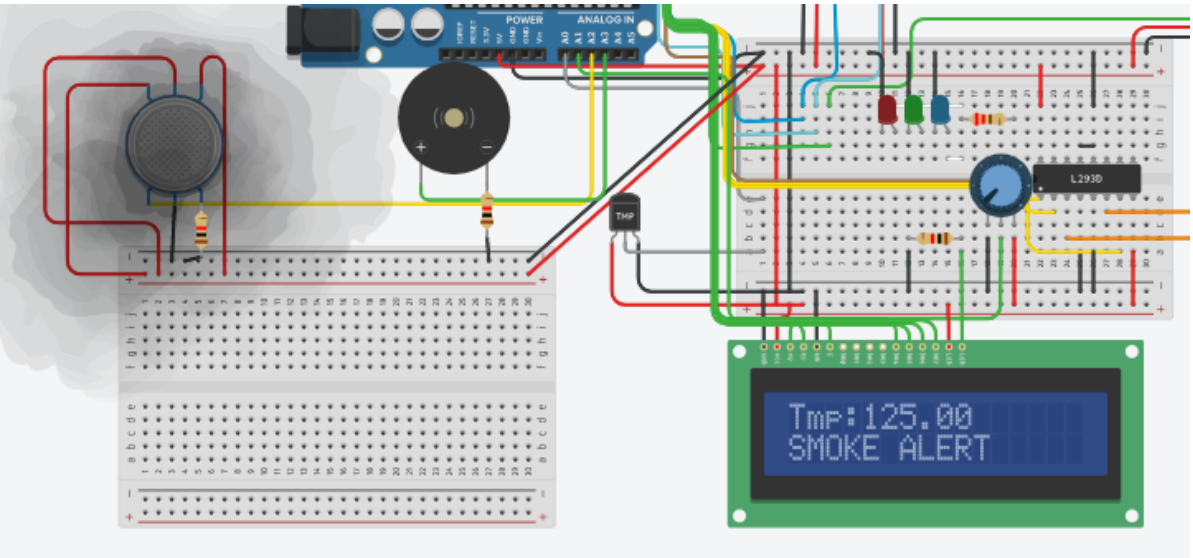


Fire Alarm System:

Smoke not detected



Smoke Detected



List of members with their assigned tasks

Diones, Cedrick – Circuits, Coding, Introduction, Limitations

Caborda, Justine – Circuits, Coding, Debugging, Discussion/Other Information, Conclusion

Cagna-an, John Albert – Circuits, Debugging, Compilation of Documents, Objectives, Features/Capabilities

Group Collaboration:

Gdrive Link:

https://drive.google.com/drive/folders/1cA5_63sD9sS-dxOxrbW0qOTqBw5OgE6T?usp=sharing