TEAM VICTOR

PROJECT TITLE

DETECTING OF HARMFULL GASES IN SEWAGE LINES

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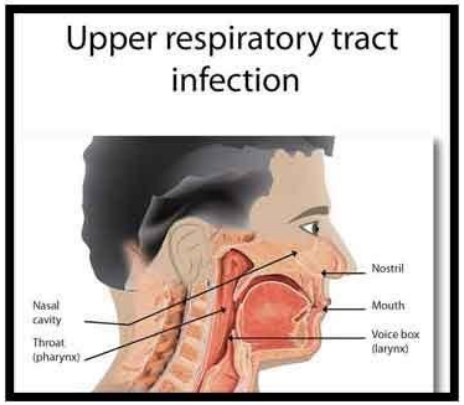
PROBLEM TO BE ADDRESSED

- In India there is a problem of dying of workers who works at cleaning of sewage lines. It happens due to collection of harmful gases as Methane, Hydrogen Sulphide in sewage lines.
- Inhaling these gases for long duration can cause serious health problems, because of these gases death rate of sewage workers increases in recent years since in most of the countries the cleaning of the drainage system is still done manually.
- It is very important that drainage system works properly to keep our surrounding clean and healthy and safe

REALITY OF SEWAGE WORKERS IN INDIA

1)

2)



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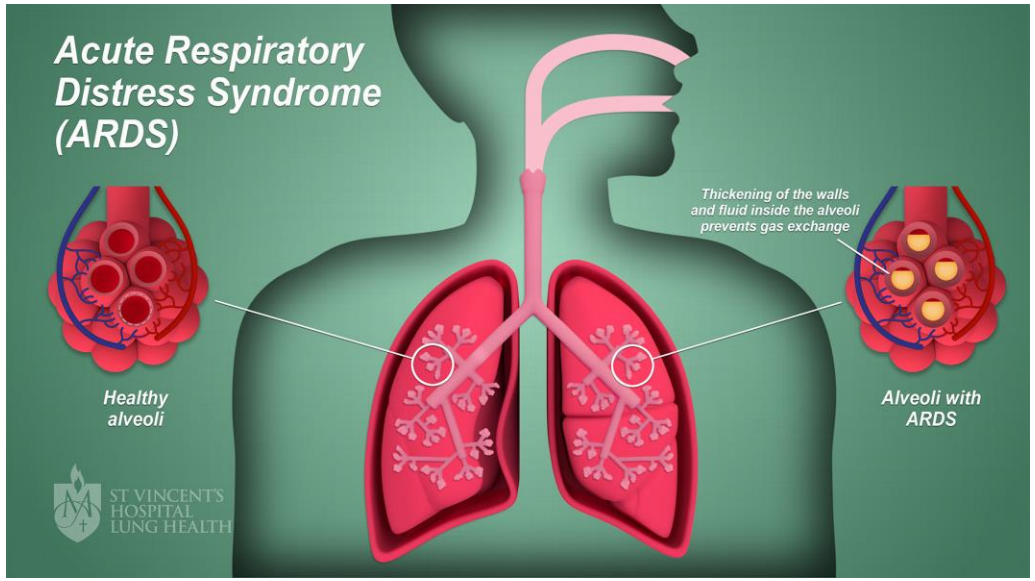


HARMFUL DISEASES

- 1)HEAVY COUGHING
- 2)UPPER RESPIRATORY INFECTION
- 3) ACUTE RESPIRATORY DISTRESS SYNDROME (ARDS)

SOLUTION OF THE PROBLEM

We create a gas sensing device that detects the presence of these chemicals in the sewage stream. It also contains a red and green signal, which implies that if the signal is red, the worker should not enter the sewage line; if the signal is green, the worker should enter the sewage line and clean it.

A buzzer was also utilized. The buzzer begins to tune when the sensor detects gas in the atmosphere, indicating the presence of dangerous gasses in the sewage line.

When tuning the buzzer, there is also an LCD display that shows "alerts." The LCD will display "SAFE" if the buzzer does not tune.

PROPOSED MODEL

Methane, Hydrogen Sulfide, Carbon Dioxide, and Ammonia are the four major gasses found in large quantities in sewage pipes, with Hydrogen Sulfide being the most dangerous. We will installed four different types of gas sensors to detect and sense the quantity of these pollutants in the sewage line.

These sensors are connected to an Arduino Uno board with a green and red LED. If the gas level is below the danger limit, the green LED will light up; otherwise, the red LED will remain dark.

We propose a low-cost method for monitoring the condition of these hazardous gasses and alerting individuals in the case of a potential threat in this project. In the suggested system, a gas sensor determines the concentration of each gas and issues a warning via a buzzer and LED lights. There is also an LCD display that indicates "ALERT" when the buzzer is adjusting. The LCD will indicate "SAFE" if the buzzer does not tune.

PROPOSED MODEL

The study's main purpose is to reduce the number of workers who die as a result of toxic gasses. These findings could aid municipal governments in identifying dangerous areas and taking preventative measures. This system sends out an alert when there are dangerous gasses in the sewage pipeline. A USB-powered gas leak detection device is on display, with early warning signals in less severe circumstances and a high-pitched alert in emergency cases to safeguard humans.

We are also using Node-MCU so that we can send our sensor data on the Thing speak channel from where we can access the real time data. In this project, we utilize the Node MCU to join the internet of things and receive an alert message using Thing speak. It functions as a wireless module . By connecting the MQ2 sensor to the Node MCU, we can improve things and save people in a quick and easy manner.

COMPONENTS USED

- Arduino-uno
- breadboard
- Gas sensor (MQ-2)
- Jumper wires
- Led's
- Buzzer
- NODE-MCU

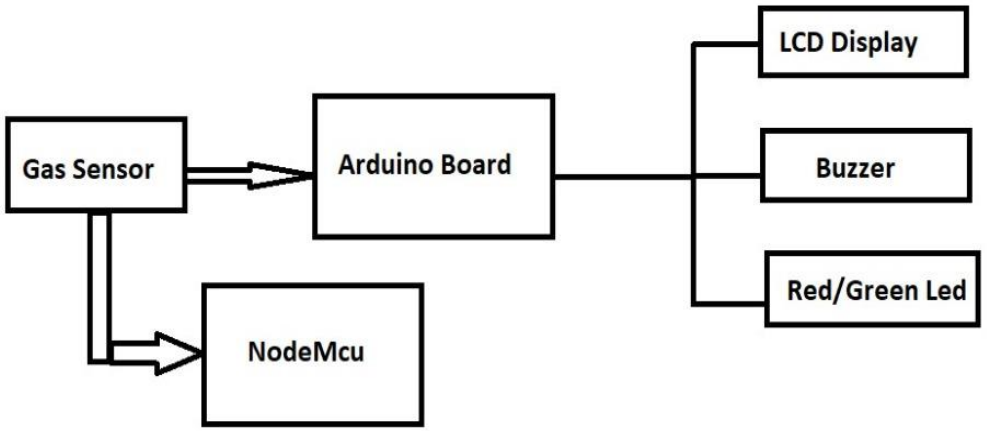
How MQ-2 Gas Sensor Works?

The MQ2 gas sensor is one of the most widely used in the MQ sensor series. It's a Metal Oxide Semiconductor (MOS) type Gas Sensor, also known as Chemiresistors because the detection is dependent on a change in the sensing material's resistance when the gas comes into contact with it. Gas concentrations can be sensed using a simple voltage divider network.

The MQ2 Gas Sensor runs on 5V DC and consumes about 800mW. It has a detection range of 200 to 10000ppm for LPG, Smoke, Alcohol, Propane, Hydrogen, Methane, and Carbon Monoxide.

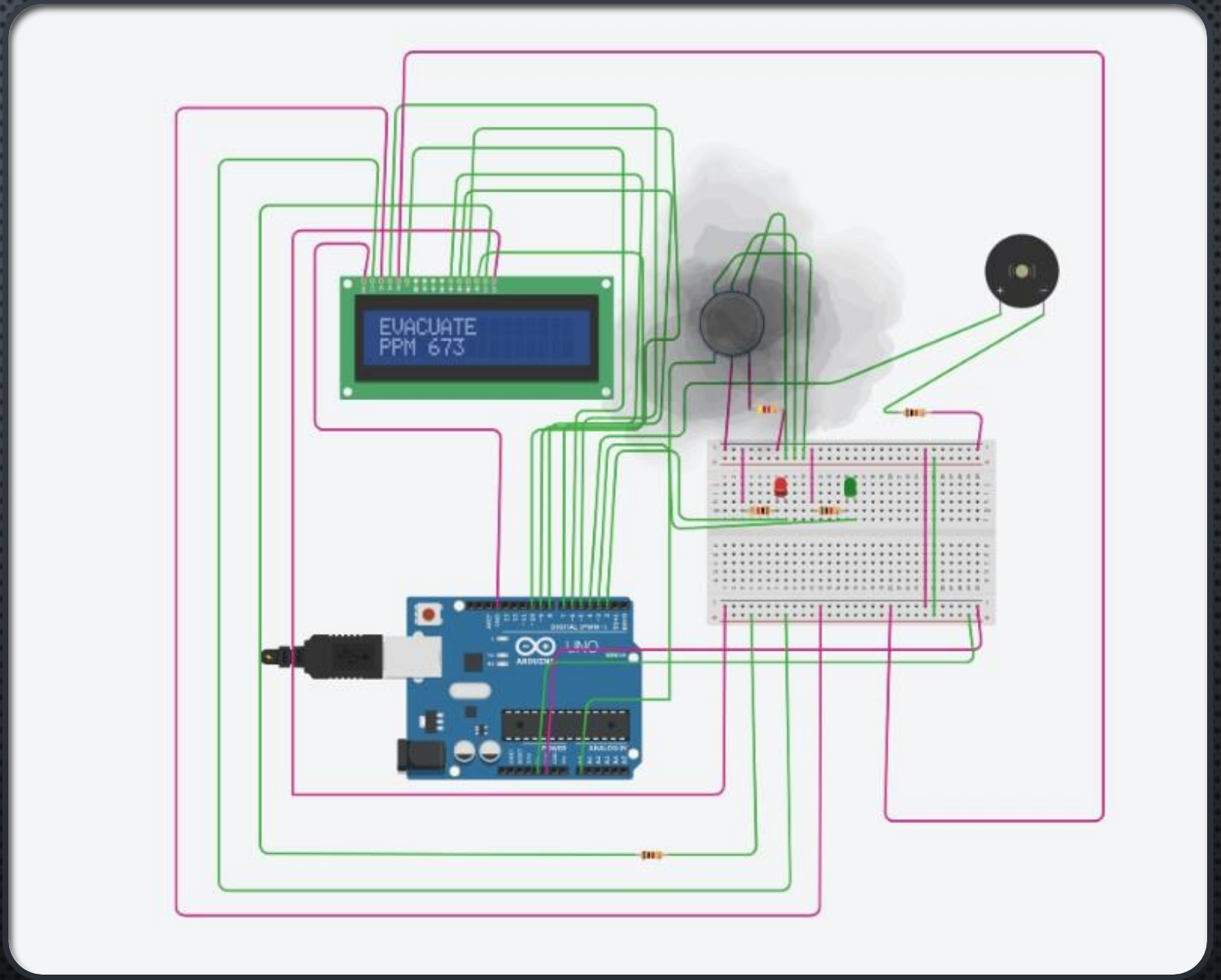
The gas sensor has mainly three pins A,B,H and h is connected with supply

BLOCK DIAGRAM



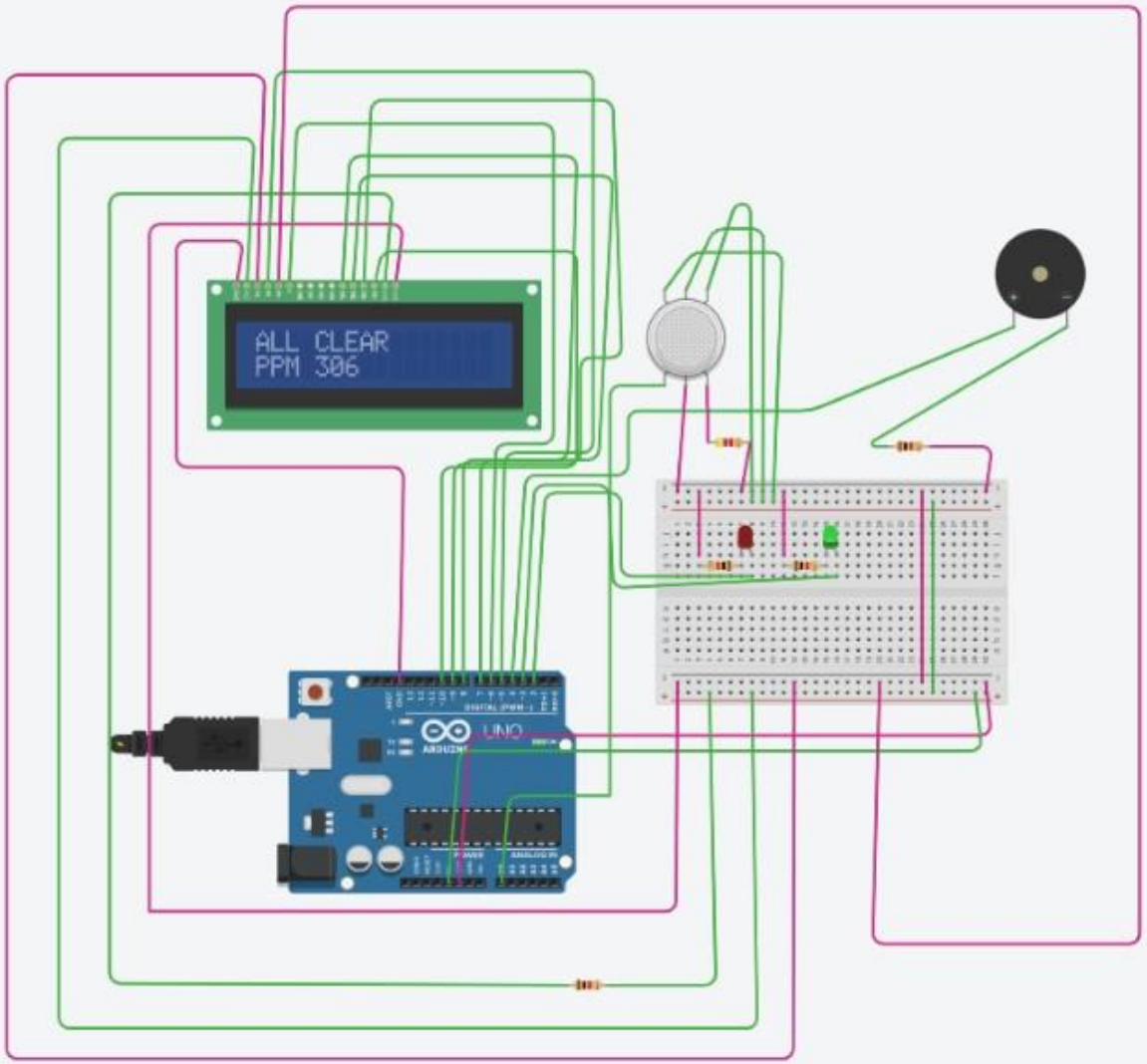
CIRCUIT SIMULATION -1

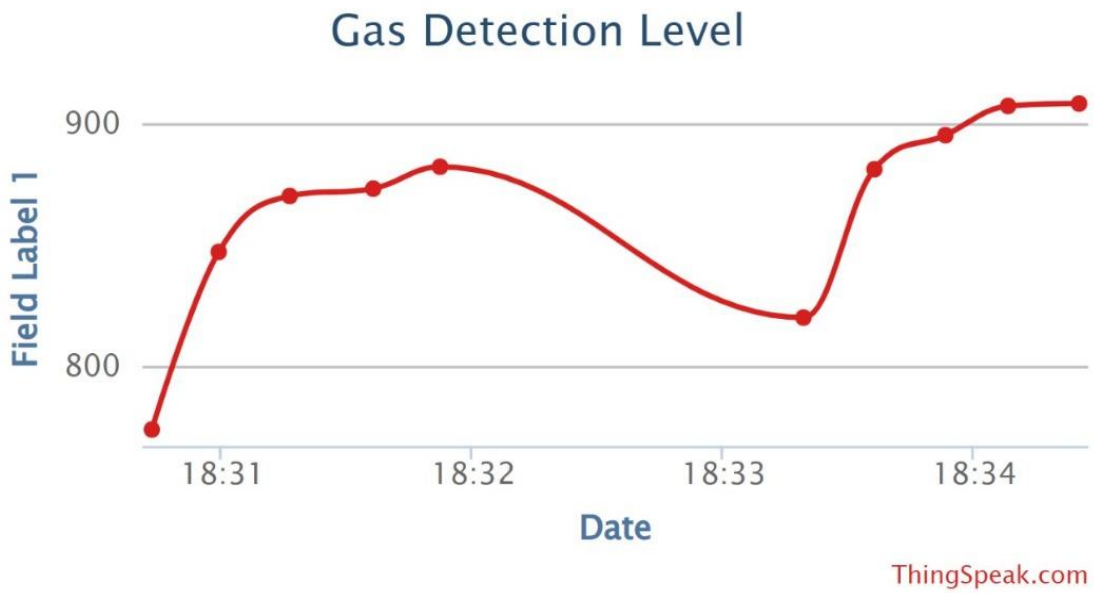
- SIMULATION HAS DONE IN TINKER CAD WHICH SHOWS THE RUNNING STATE OF THE DEVICE WHEN THERE IS GAS PRESENT IN THE SEWAGE LINE.
- PARTS : GAS SENSOR, BUZZER, LCD DISPLAY, ARDUINO , BREADBOARD.



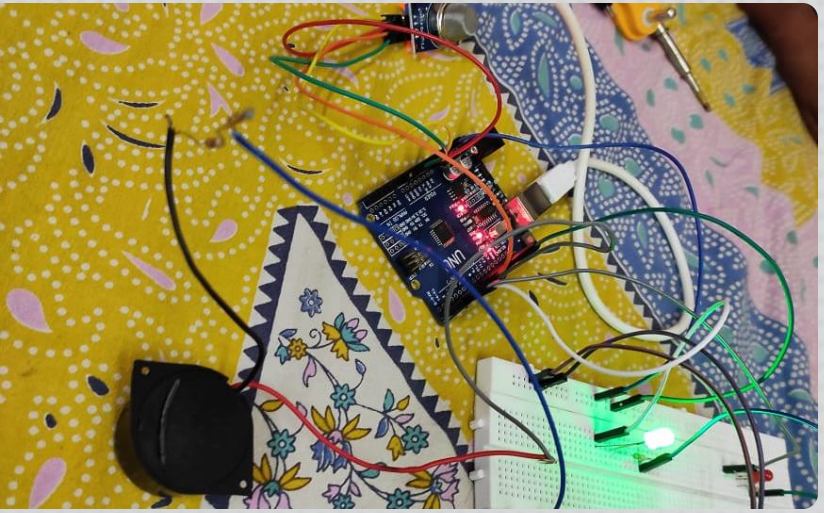
CIRCUIT SIMULATION-2

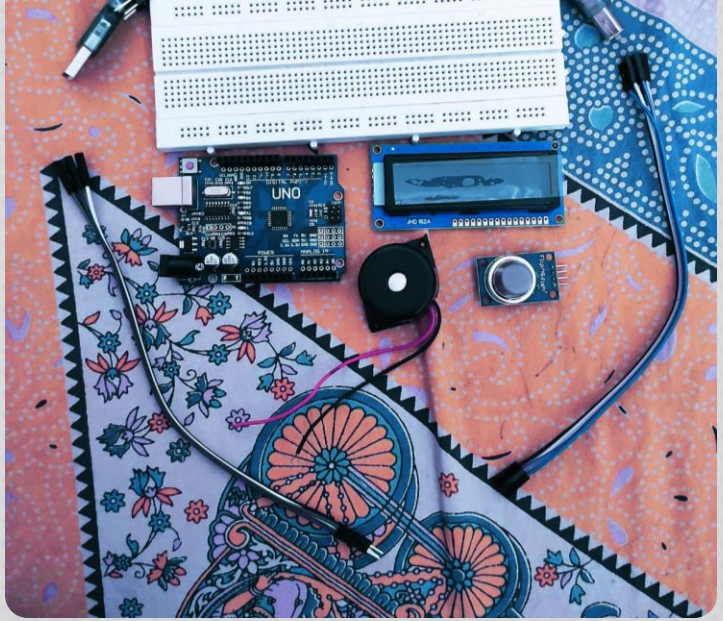
- HERE WE HAVE CHECK NO PRESENCE OF HARMFUL GASES IN SIMULATION ON TINKER CAD.
- WHEN THERE IS NO GAS PRESENT THE DEVICE WILL SHOW SAFE MESSAGE WITH GREEN LIGHT.

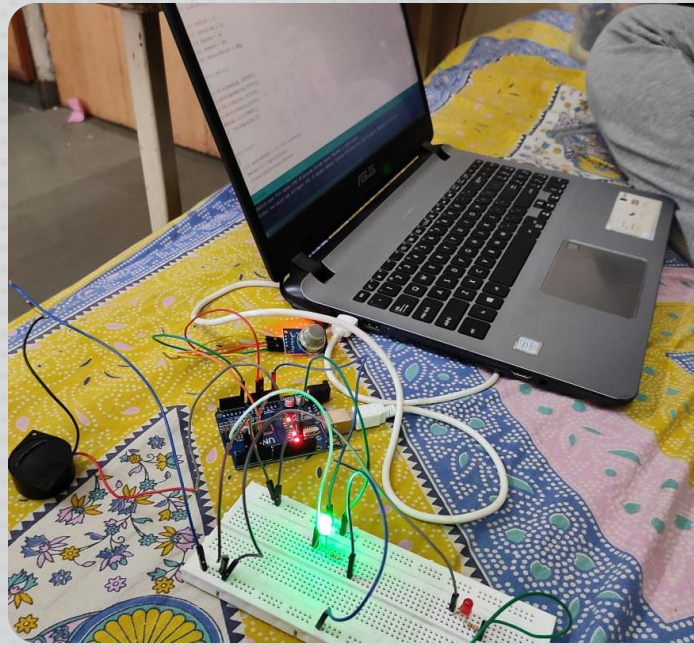


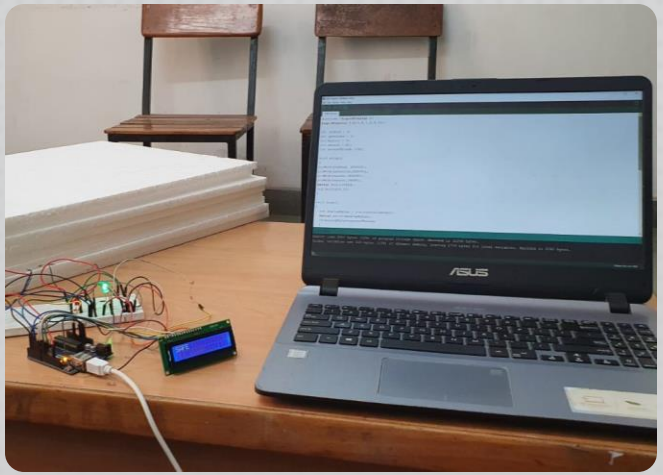


GRAPHIC DATA REPRESENTATION OF NODE-MCU ON THINGSPEAK







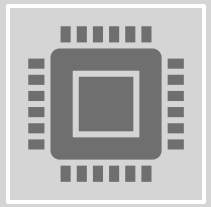


PROGRESS-WORK

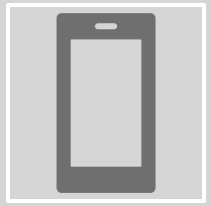
FUTURE WORK

Overall, the software and hardware parts of the systems have been developed and tested by introducing a small amount of Smoke near the gas sensor module. One of the notable future functions of this system is to add a sub-system where wastage of gas and the uses of gas can be monitored using this system.

The system is flexible as a greater number of sensors and relays can be added to it according to need. This is a gas detection, control, and alert system that operates automatically. In the future, this system will include a feature that will alert emergency services



This system is further enhanced by adding this system to mobile robots in order to get the gaseous concentration of any location or we can also add this system to drones giving more ability to this system. We can also add the pressure sensor and temperature sensor with gas sensors to get more data.



if an accident occurs. There will also be a smartphone app and a web-based app for real-time monitoring. Many smart features will be introduced to the user app for this system. The system's overall features will make it safer for consumers.

The system will be tuned for usage in a variety of settings, including the car, the house, industry, and a variety of other settings.

CONCLUSION

This system offers several advantages, including low cost, ease of use, a wide range of applications, component availability, efficiency, compatibility, portability, and durability. The building is constructed in such a way that it is both user-friendly and repairable. The gas sensors should be identified, as well as the critical level of the individual gas so that the system can send an alert if the concentration of toxic gasses exceeds particular thresholds. When toxic gasses are detected in a sewage pipeline or any other enclosed space, this system notifies all people who work in these regions

In terms of response time and awareness, this one outperforms the preceding one. This is a gas detection system that is low-cost, low-power, lightweight, portable, safe, user-friendly, efficient, multi-featured, and easy. Gas leak detection will not only benefit us in the health department, but it will also benefit our economy because gas leaks not only pollute the atmosphere but also waste gas, which is bad for our economy