PROJECT

GAS LEAKAGE MONITORING AND ALERTING SYSTEM FOR INDUSTRIES

(Gas detecting alarm system with arduino)

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Gas Leakage monitoring & Alerting system for Industries

1 INTRODUCTION

In the industrial sector, residential properties, and gas-powered vehicles like CNG (compressed natural gas) buses and cars, gas leakage is a major issue.In recent years, home and industrial fires have caused an increasing loss of life and property.The majority of fire accidents occur when the regulator is not turned off or a poor-quality rubber tube is used.Even when the regulator is turned off, the burner still receives gas from the regulator.Gas leaks occur when the knob is accidentally turned on.In today's world, safety is very important, so educational and work environments must have good safety systems.The safety model that is currently in use in industries has been modified by this project, and this system can also be used in homes and offices.The primary target of this venture is planning microcontroller based gas spillage criminal investigator framework.Using this device, hazardous gases like propane and liquefied petroleum gas (LPG) can be detected.Installing a gas leakage detection kit in vulnerable areas is one way to prevent accidents caused by gas leaks.This project aims to present a design that can detect gas leaks in vulnerable buildings automatically.Particularly, a high-sensitivity gas sensor was used.This task depended on melted oil gas.An immediate alarm is triggered in the event that these gases exceed the normal level.When compared to the manual method, this detection and alerting system provides a faster response time and precise emergency detection, resulting in a faster dissemination of the critical.

1.1 PROJECT OVERVIEW

The project put out the issue of a GAS container running out of gas, which is the most prevalent one we encounter on a daily basis. We present this article in order to raise awareness of the decreasing weight of the gas in the container and to use IOT to buy gas. The booking or order for gas is being done with the aid of IOT, and that a load cell connected to a microcontroller is used to continuously measure weight (to compare with an ideal value).The leakage of the gas causes destructible impact to the lives and as well as to the heritage of the people. So, by keeping it in the concept of the project we have determined to develop an examining system which finds the leak of LPG gas and protects the work places by taken correct precaution at correct time. This system provides the information such as when a gas leakage is noticed, sensors of in the project are used to notice the gas leakage and immediately turns ON the buzzer for the danger indication. Buzzer is a clear indication of gas leakage. By the detection of the hazardous gas the alerting message reached to the person who has control over it from the GSM.Detection of the gas leakage is important and halting leakage is important equally. The main objective of this project is that it is extremely accurate with a least cost, this project system is best to detect gas leakage and also warn people around by buzzer beep sound and an SMS is been send to the responsible person for preparatory safe calculations.

1.2 PURPOSE

This device will be able to identify gas leaks and inform users via loud alarms as well.
This device can alert the user if there are excessive amounts of dangerous gases present in the surroundings. System can send a message to society administrators informing them of the situation before an accident occurs. Gas detector sensors, an Arduino board, an ESP8266, and a cloud server make up the system. All flat member users can be registered on our system by a single society authority person. The administrator of the society can enter information on each flat's users, including their user name, phone number, and flat sensor information. A society administrator can set each sensor's threshold value. Each flat can be equipped with system hardware. The value per time can be sensed using sensors. The values can be sent by the system to a cloud server.

2 .LITERATURE SURVEY

The project put out the issue of a GAS container running out of gas, which is the most prevalent one we encounter on a daily basis. We present this paper in order to raise awareness of the decreasing weight of the gas in the container and to use IOT to order gas.

2.1 GAS SENSOR

When a gas leak is detected by the MQ 2 sensor, which is essentially an LPG (liquefied petroleum gas) made up of propane and butane, the sensor will send a high pulse to the Mc, updating it in the IoT, and even a buzzer is audible in the RF Rx kit. Additionally, the issue can be resolved. Thus, as previously described, the overall components and sensors play a function in the article.

2.2 Cloud Connected Smart Gas Leakage Detection

In order to prevent any potential mishaps, the project designs and develops a cloud-connected smart LPG gas cylinder platform that serves as a safety device for detecting LPG gas leaks at low levels. In order to give real-time monitoring and alerts through the Internet, it is also capable of detecting the outbreak of a fire in the vicinity and the weight of the gas. If an abnormal state is found, the gadget creates an alert email to other authorities and sends a notification to the user's smartphone app. Additionally, the gadget automatically initiates safety precautions such as gas valve closure, ventilation opening, fire sprinkler activation, and house electrical power supply cut-off when detecting a gas leak or a fire outbreak.

2.3 REFERENCES

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[4] Asmita Varma, Prabhakar S, Kayalvizhi Jayavel. “Gas Leakage Detection and Smart Alerting and Prediction Using IoT." Internet of Things and Applications (IOTA), International Conference on. IEEE, 2017

[5] Mohammad Reza Akhondi, Alex Talevski, Simon Carlsen, Stig Petersen. “Applications of Wireless Sensor Networks In the Oil, Gas And Resources Industries." International Conference On Advanced Information Networking And Applications, IEEE 2010

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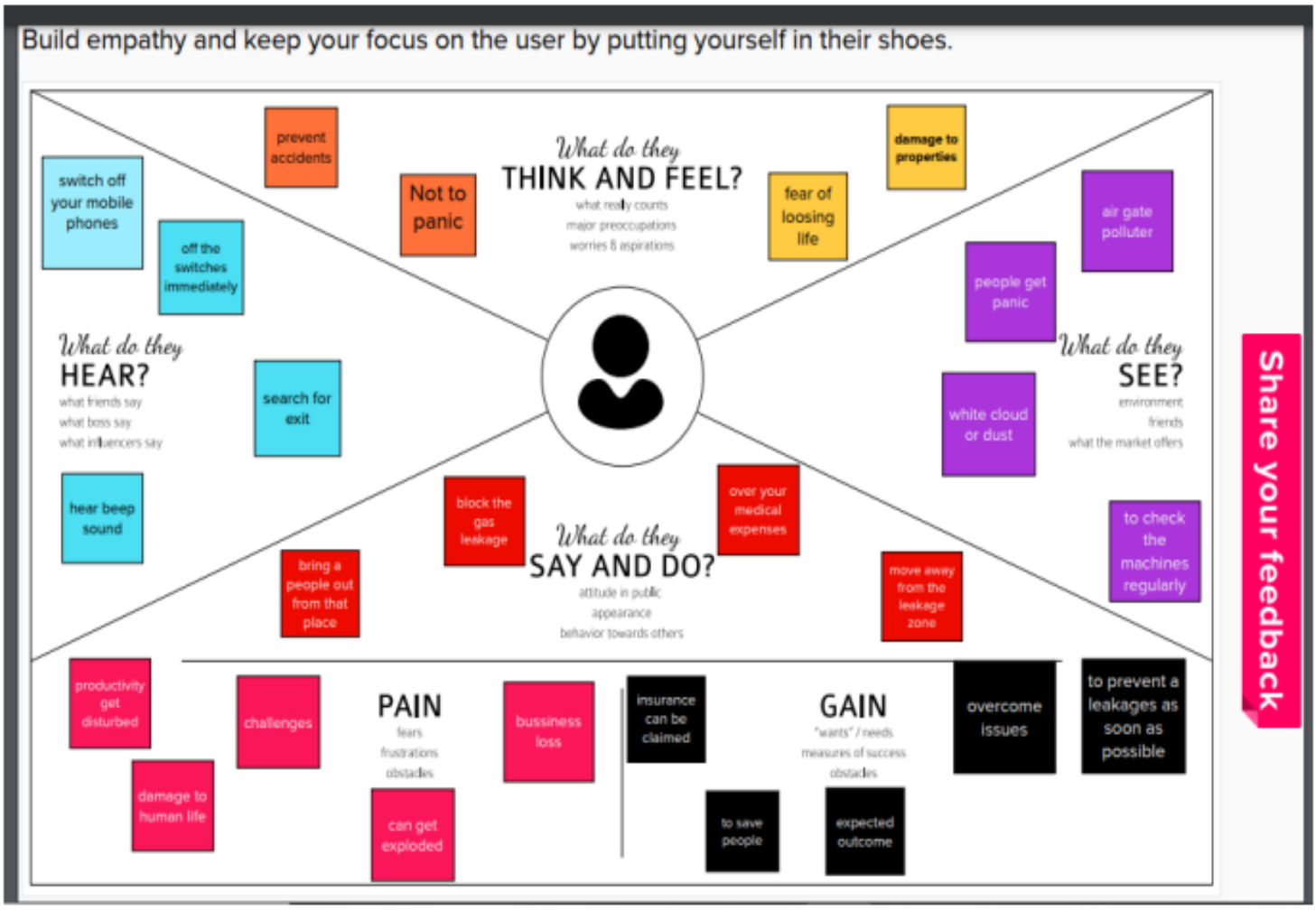
[7] Tyler Kersnovski, Felipe Gonzalez, Kye Morton. "A UAV System For Autonomous Target Detection And Gas Sensing." Yellowstone Conference Center, Big Sky, Montana, IEEE 2017

3. IDEATION OR PROPOSED SOLUTION

3.1 EMPATHY MAP CANVAS



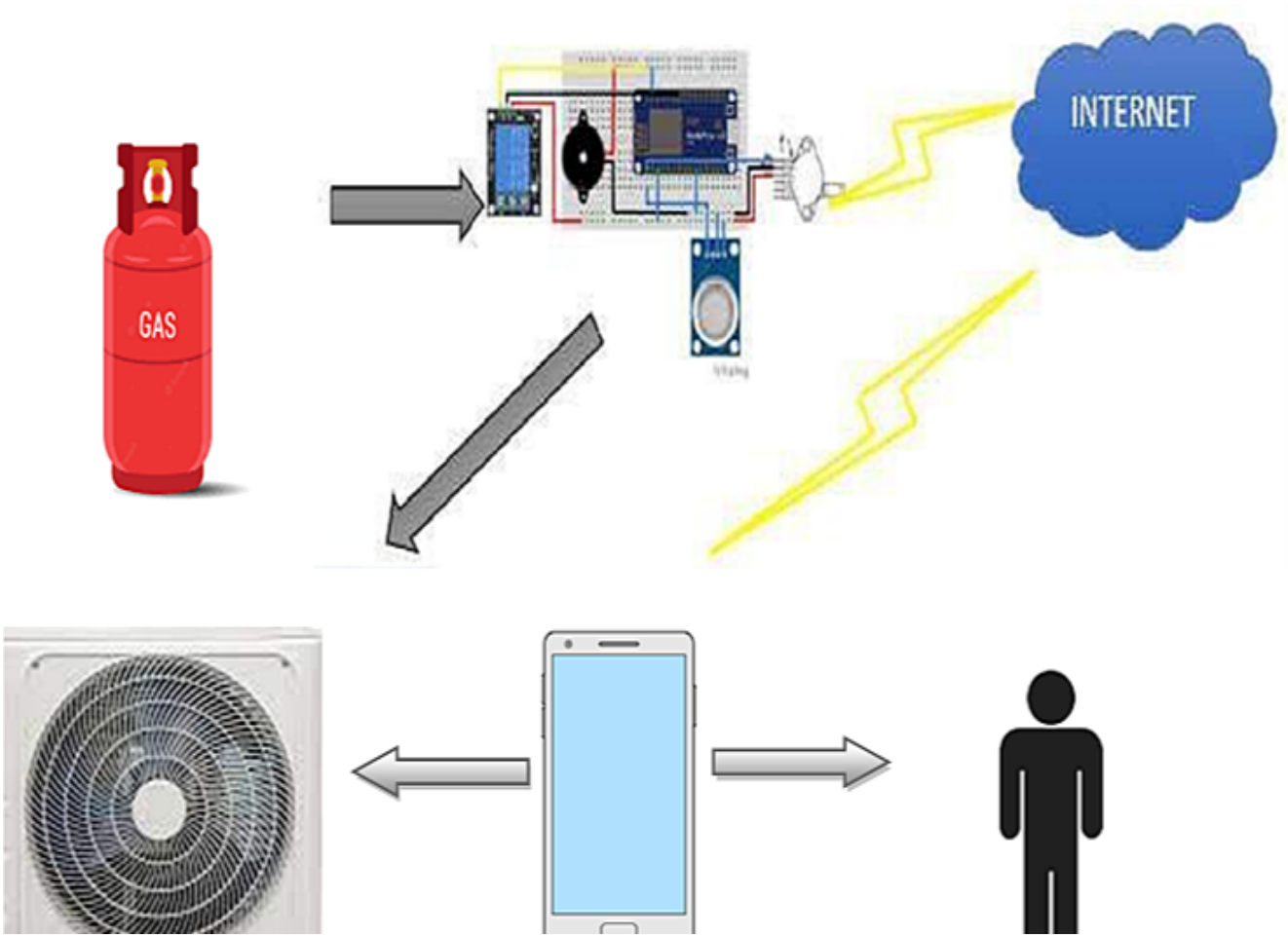
3.2 IDEATION OR BRAIN STORMING

3.3 PROPOSED SOLUTION

1. CUSTOMER SEGMENT(S) • Oil, Gas, Polymer Industries • Hospitals • Safety Control Personals • Mining	**6.CUSTOMER CONSTRAINTS** • Network Connection • Installation Complexity • High installation costs force them to move far from current technologies.	**5. AVAILABLE SOLUTIONS** • Converting to a plan with a premium network • Getting a connection to the network from a reputable service provider
2. JOBS TO BE BE DONE / PROBLEMS • Suffering numerous losses as a result of gas leakage. • Not having a proper system in place to control or monitor the leak. • Having significant financial difficulties in purchasing and putting in place a system for controlling and monitoring	**9.PROBLEM ROOT CAUSE** • The device's ability to function in harsh environments is greatly influenced by the quality of the materials it is constructed from. • The network issue is caused by the user's network plan and the location of the device installation.	**7.Behavior** • A particular industry only experiences a hostile environment, As a result, the problem rarely arises. In such a situation, the customer makes multiple complaints to get attention. • Because the majority of industries are situated in rural areas, network issues are extremely prevalent. Here, you can get in touch with both service providers and developers.

3.TRIGGERS • Because of the severe damage or more serious health issues caused by the toxic gases, they are driven to find a solution as soon as possible. • The device's use is shown in the news.	**10.YOUR SOLUTION:** • The device's network strength can be improved. • The device can be manufactured to various environmental standards. • Employees will be able to respond appropriately in an emergency with the assistance of a proper evacuation plan and emergency drills.	**8. CHANNELS OF BEHAVIOUR** **8.1 ONLINE** • E-Mail to developers • Online Community **8.2 OFFLINE** • Objection Letters • The product can be returned easily.
4.EMOTIONS:BEFORE/AFTER • The user feels cheated and deceived prior to taking the action. • The user senses the developers' sincerity once the issue is resolved.		

3.4 PROPOSED SOLUTION FIT



4. REQUIREMENT ANALYSIS

4.1 FUNCTIONAL REQUIREMENT

Following are the functional requirements of the proposed solution.

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	User Registration	The system gas leakage detects gas in the atmosphere and will be continuously update and display the gas value. the value can be seen by the user through the mobile app easily.
FR-2	User Confirmation	The user after connecting the system to the internet send a message to the user saying that the system is activated and ready to perform
FR-3	User Authentication	Normal webpage is shown to the user. It shows the sensor values stored in the database. It also displays the prediction to the user for the values external by him.
FR-4	User processing	The user start the system by connecting to a hotspot or a wi-fi connection.
FR-5	User Business goal	The internet of things is the system of gadgets, vehicles and home machine that contain hardware, programming, actuators, and network which enables these things to interface, collaborate and trade information
FR-6	User Reporting	It decided whether the environment is safe or not and accordingly a message will be sent.

4.2 NON FUNCTIONAL REQUIREMENT

Following are the non-functional requirements of the proposed solution.

FR No.	Non-Functional Requirement	Description
NFR-1	**Usability**	The system interface should be easy and effective.
NFR-2	**Security**	the communication between the Arduino and the GLDS should be secure by encryption. The system should not display the homeowner personal information to anyone.
NFR-3	**Reliability**	The system should be operated in android reliable system.
NFR-4	**Performance**	The system should response immediately to any leakage situation The system should update the local database in real time.
NFR-5	**Availability**	The system should work 24 hours 7 days a week.
NFR-6	**Scalability**	The gas detector should be from anywhere at any time. The homeowner information should be modified easily.

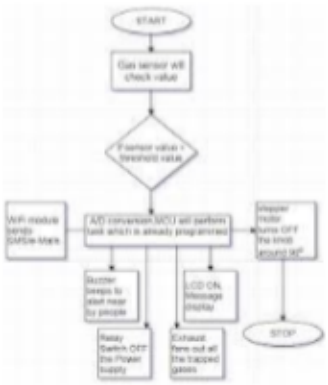
5.PROJECT DESIGN

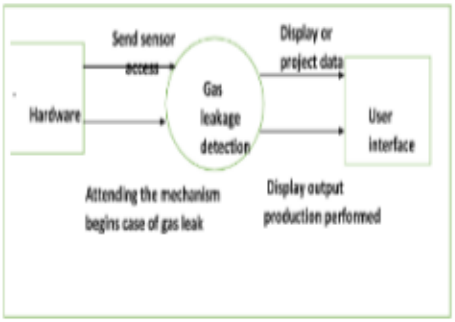
5.1 DATA FLOW DIAGRAM

Data Flow Diagrams:

A Data Flow Diagram (DFD) is a traditional visual representation of the information flows within a system. A neat and clear DFD can depict the right amount of the system requirement graphically. It shows how data enters and leaves the system, what changes the information, and where data is stored.

Example: (Simplified)





Level 0 : DFD

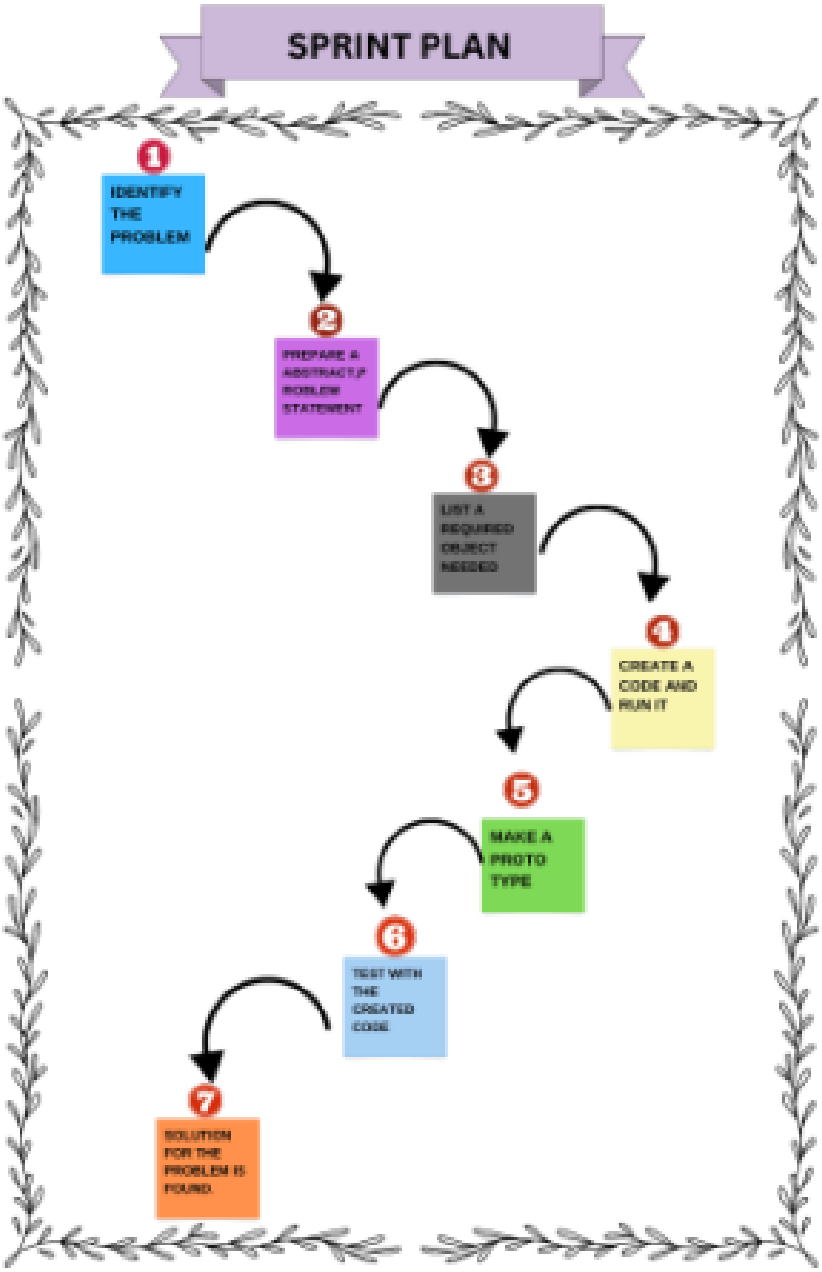
5.2 USER STORY

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Release
Customer (Mobile user)	Registration	USN-1	As a user, I can register for the application by entering my email, password, and confirming my password.	I can access my account / dashboard	High	Sprint-1
		USN-2	As a user, I will receive confirmation email once I have registered for the application	I can receive confirmation email & click confirm	High	Sprint-1
		USN-3	As a user, I can register for the application through Facebook	I can register & access the dashboard with Facebook Login	Low	Sprint-2
		USN-4	As a user, I can register for the application through Gmail	I can register access the dashboard with the g-mail	Medium	Sprint-1
	Login	USN-5	As a user, I can log into the application by entering email & password	I can register user and logged out, if I go to the login page and enter my user name and password and click on login then the data associate to my user should be accessible	High	Sprint-1
	Dashboard	USN-1	As a user, I can register dashboard email or password	I can register password and click the login then log in fail with the error message that specifies that the username or password was wrong	High	Sprint-1
Customer (Web user)	Login	USN-2	As a user, I can register for the application through the g-mail	I can receive the application from the g-mail	High	Sprint-2
Customer Care Executive	Registration	USN-3	We have all needed help from a customer service executive at one time or another, sometimes its cell phone with garbled	I can register from the customer service executive the form of application	Medium	Sprint-1

			display or a lost or an urgent gas leakage.			
Administrator	Help desk	USN-4	Agent to provide emergency step to customer	I can provide a emergency step to customer	Medium	Sprint-2
	Manage	USN-5	Control centre failure response team turn off all ovens, open flames, and other potential, ignition sources.	I can provide a control centre failure response team turn off all ovens, open flames, and other potential, ignition	High	Sprint-1

6. PROJECT PLANNING & SCHEDULING

6.1 SPRINT PLANNING



6.2 SPRINT DELIVERY SCHEDULE

Product Backlog, Sprint Schedule, and Estimation (4 Marks)

Use the below template to create product backlog and sprint schedule

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-1	Registration	USN-1	As a user, I can register for the application by entering my email, password, and confirming my password.	2	High	[illegible]
Sprint-1		USN-2	As a user, I will receive confirmation email once I have registered for the application	1	High	[illegible]
Sprint-2		USN-3	As a user, I can register for the application through [illegible]	2	Low	[illegible]
Sprint-1		USN-4	As a user, I can register for the application through Gmail	2	Medium	[illegible]
Sprint-1	Login	USN-5	As a user, I can log into the application by entering email & password	1	High	[illegible]
[illegible]	[illegible]	USN-6	[illegible]	1	High	[illegible]
Sprint-1	Help desk	USN-7	[illegible]	2	Medium	[illegible]
[illegible]	Manage	USN-8	[illegible]	1	High	[illegible]

Project Tracker, Velocity & Burndown Chart: (4 Marks)

Sprint	Total Story Points	Duration	Sprint Start Date	Sprint End Date (Planned)	Story Points Completed (as on Planned End Date)	Sprint Release Date (Actual)
Sprint-1	20	6 Days	24 Oct 2022	29 Oct 2022	20	29 Oct 2022
Sprint-2	20	6 Days	31 Oct 2022	05 Nov 2022	20	05 Nov 2022
Sprint-3	20	6 Days	07 Nov 2022	12 Nov 2022	20	12 Nov 2022
Sprint-4	20	6 Days	14 Nov 2022	19 Nov 2022	20	19 Nov 2022

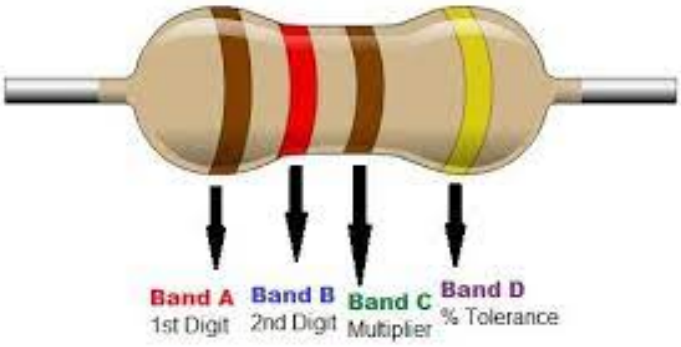
Velocity:
Imagine we have a 10-day sprint duration, and the velocity of the team is 20 (points per sprint). Let's calculate the team's average velocity (AV) per iteration unit (story points per day)

7. METHODS AND MATERIALS

ARDUINO UNO:

The Arduino Uno is an open-source microcontroller board based on the Microchip ATmega328P microcontroller and developed by Arduino.cc and initially released in 2010. The board is equipped with sets of digital and analog input/output (I/O) pins that may be interfaced to various expansion boards (shields) and other circuits.The board has 14 digital I/O pins (six capable of PWM output), 6 analog I/O pins, and is programmable with the Arduino IDE (Integrated Development Environment), via a type B USB cable. It can be powered by the USB cable or by an external 9-volt battery, though it accepts voltages between 7 and 20 volts. It is similar to the Arduino Nano and Leonardo.Rather than requiring a physical press of the reset button before an upload, the Arduino/Genuino Uno board is designed in a way that allows it to be reset by software running on a connected computer. One of the hardware flow control lines (DTR) of the ATmega8U2/16U2 is connected to the reset line of the ATmega328 via a 100 nanofarad capacitor. When this line is asserted (taken low), the reset line drops long enough to reset the chip.

RESISTOR:



A **resistor** is a passive two-terminal electrical component that implements electrical resistance as a circuit element. In electronic circuits, resistors are used to reduce current flow, adjust signal levels, to divide voltages, bias active elements, and terminate transmission lines, among other uses. High-power resistors that can dissipate many watts of electrical power as heat may be used as part of motor controls, in power distribution systems, or as test loads for generators. Fixed resistors have resistances that only change slightly with temperature, time or operating voltage. Variable resistors can be used to adjust circuit elements (such as a volume control or a lamp dimmer), or as sensing devices for heat, light, humidity, force, or chemical activity.

Resistors are common elements of electrical networks and electronic circuits and are ubiquitous in electronic equipment. Practical resistors as discrete components can be composed of various compounds and forms. Resistors are also implemented within integrated circuits.

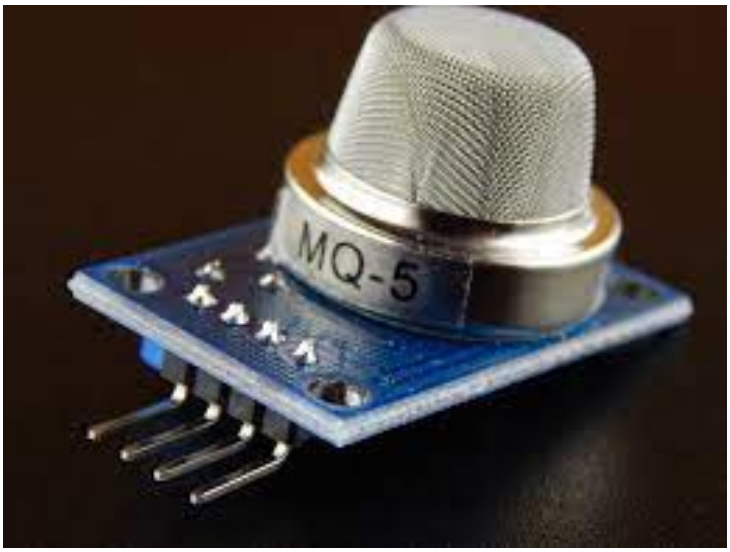
The electrical function of a resistor is specified by its resistance: common commercial resistors are manufactured over a range of more than nine orders of magnitude. The nominal value of the resistance falls within the manufacturing tolerance, indicated on the component.

PIEZO BUZZER:

In simplest terms, a piezo buzzer is a type of electronic device that's used to produce a tone, alarm or sound. It's lightweight with a simple construction, and it's typically a low-cost product. Yet at the same time, depending on the piezo ceramic buzzer specifications, it's also reliable and can be constructed in a wide range of sizes that work across varying frequencies to produce different sound outputs.

Piezoelectric buzzers, or piezo buzzers, as they are sometimes called, were invented by Japanese manufacturers and fitted into a wide array of products during the 1970s to 1980s. This advancement mainly came about because of cooperative efforts by Japanese manufacturing companies. In 1951, they established the Barium Titanate Application Research Committee, which allowed the companies to be "competitively cooperative" and bring about several piezoelectric innovations and inventions.

GAS SENSOR:



Gas sensors (also known as gas detectors) are electronic devices that detect and identify different types of gasses. They are commonly used to detect toxic or explosive gasses and measure gas concentration. Gas sensors are employed in factories and manufacturing facilities to identify gas leaks, and to detect smoke and carbon monoxide in homes. Gas sensors vary widely in size (portable and fixed), range, and sensing ability. They are often part of a larger embedded system, such as hazmat and security systems, and they are normally connected to an audible alarm or interface. Because gas sensors are constantly interacting with air and other gasses, they have to be calibrated more often than many other types of sensors.

Depending on their intended environments and functions, the physical makeup and sensing process can vary notably between sensors. One of the most commonly used gas sensors for toxic identification and smoke detection is the metal oxide based gas sensor. Metal oxide gas sensors increase their electrical resistance as they come into contact with gasses such as carbon monoxide, hydrogen, methane, and butane.

RED AND GREEN LED:

A light-emitting diode (LED) is a semiconductor device that emits light when current flows through it. Electrons in the semiconductor recombine with electron holes, releasing energy in the form of photons. The color of the light (corresponding to the energy of the photons) is determined by the energy required for electrons to cross the band gap of the semiconductor.White light is obtained by using multiple semiconductors or a layer of light-emitting phosphor on the semiconductor device.

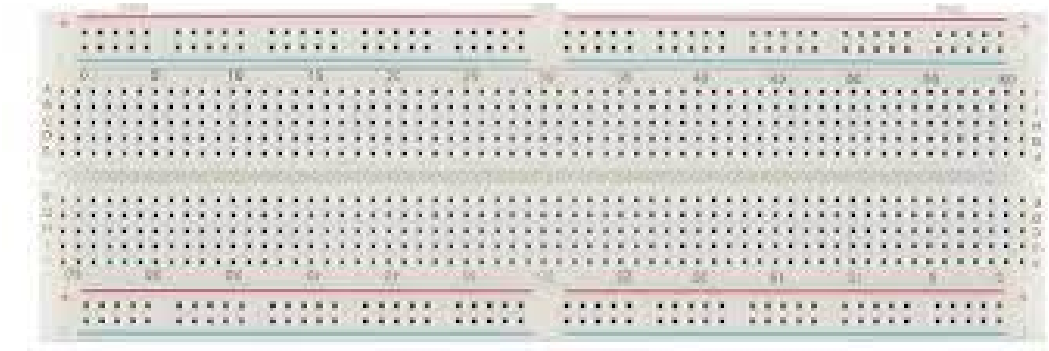
Appearing as practical electronic components in 1962, the earliest LEDs emitted low-intensity infrared (IR) light.Infrared LEDs are used in remote-control circuits, such as those used with a wide variety of consumer electronics. The first visible-light LEDs were of low intensity and limited to red. Early LEDs were often used as indicator lamps, replacing small incandescent bulbs, and in seven-segment displays. Later developments produced LEDs available in visible, ultraviolet (UV), and infrared wavelengths, with high, low, or intermediate light output, for instance white LEDs suitable for room and outdoor area lighting.

16x2 LCD:

The term LCD stands for liquid crystal display. It is one kind of electronic display module used in an extensive range of applications like various circuits & devices like mobile phones, calculators, computers, TV sets, etc. These displays are mainly preferred for multi-segment light-emitting diodes and seven segments. The main benefits of using this module are inexpensive; simply programmable, animations, and there are no limitations for displaying custom characters, special and even animations, etc.

A 16x2 LCD means it can display 16 characters per line and there are 2 such lines. In this LCD each character is displayed in 5x7 pixel matrix. The 16 x 2 intelligent alphanumeric dot matrix display is capable of displaying 224 different characters and symbols. This LCD has two registers, namely, Command and Data.

BREADBOARD:



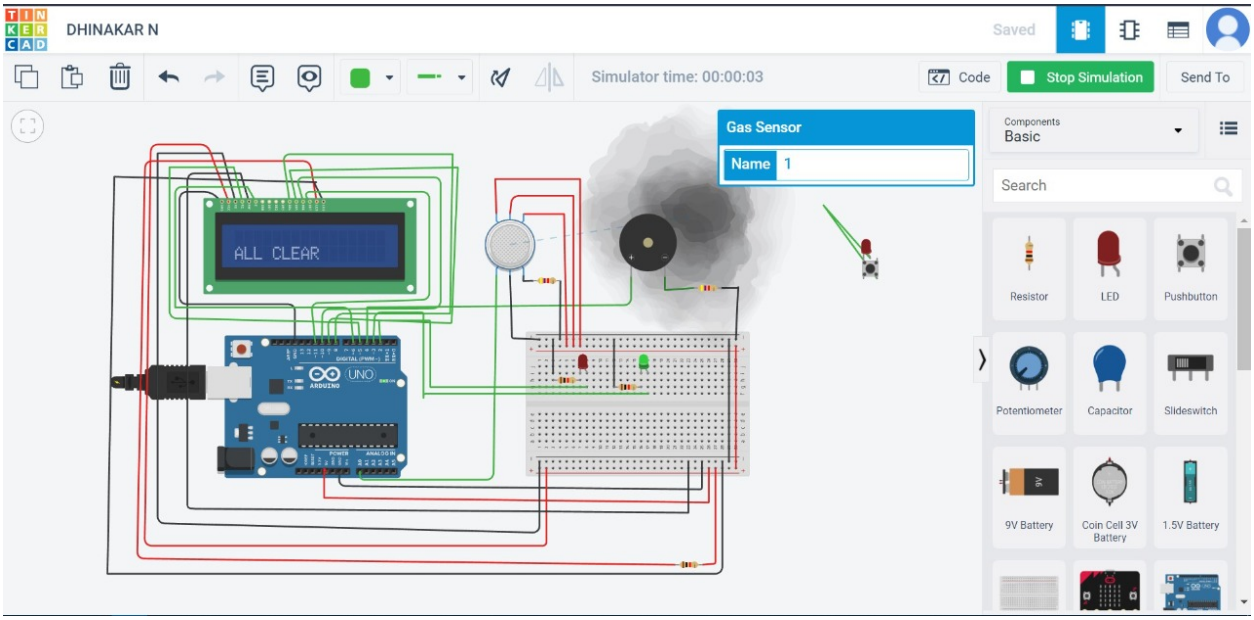
A breadboard, solderless breadboard, or protoboard is a construction base used to build semi-permanent prototypes of electronic circuits. Unlike a perfboard or stripboard, breadboards do not require soldering or destruction of tracks and are hence reusable. For this reason, breadboards are also popular with students and in technological education.

A variety of electronic systems may be prototyped by using breadboards, from small analog and digital circuits to complete central processing units (CPUs).

Compared to more permanent circuit connection methods, modern breadboards have high parasitic capacitance, relatively high resistance, and less reliable connections, which are subject to jostle and physical degradation. Signaling is limited to about 10 MHz, and not everything works properly even well below that frequency.

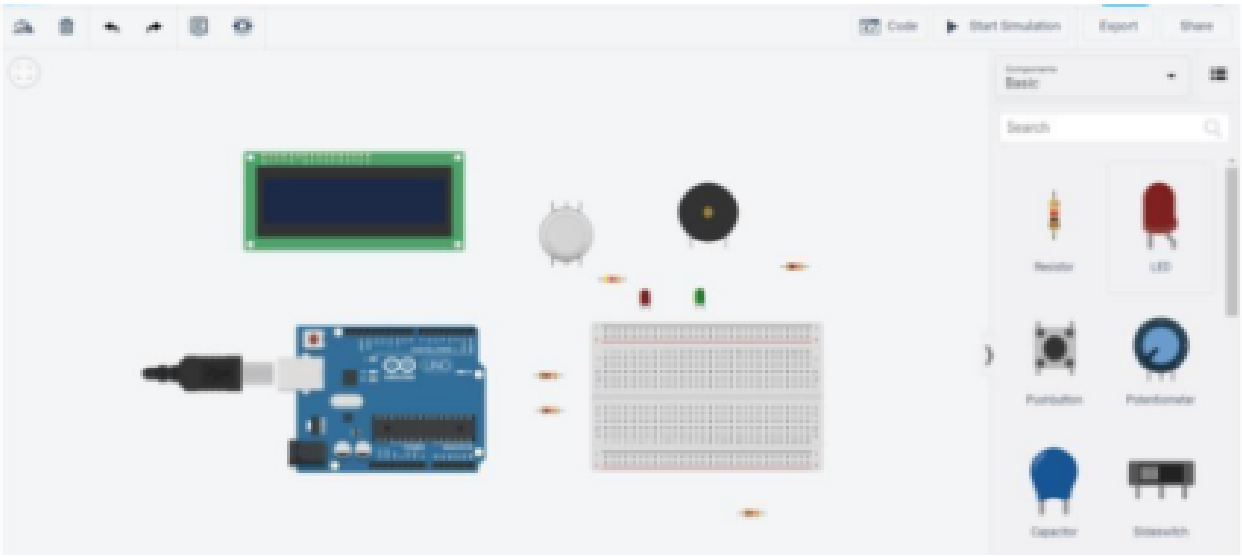
8. PROJECT

Gas detecting alarm system with arduino

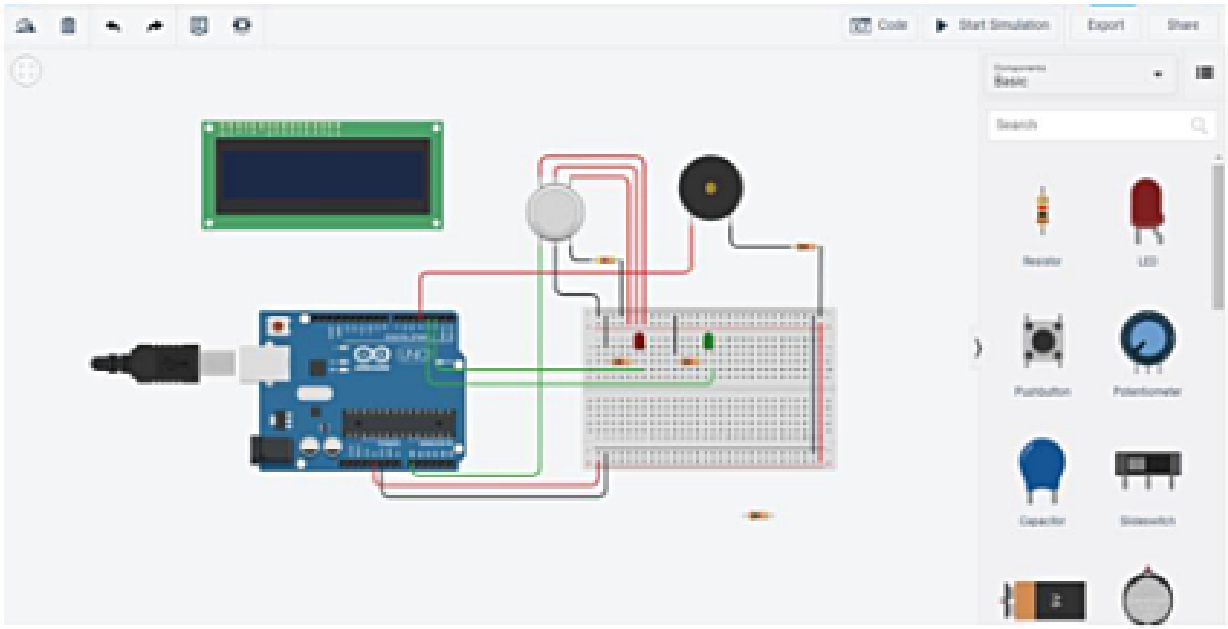


how to build an Arduino gas detecting alarm system in tinkercad. This circuit uses the gas sensor to detect if there is fire, smoke, or gas leakage nearby.Using the LCD and the alarm, this circuit also can display its “Gas Leakage Alert” message, while alerting people nearby. We have used a gas sensor module to detect gases. If a gas leakage occurs, the sensor gives a HIGH pulse and when the Arduino gets a HIGH pulse from the sensor, it sends a signal to the LCD and the piezo buzzer. Then the LCD would show the “Evacuate" message and activates the piezo buzzer which beeps again and again until the gas detector doesn't sense the gas in the environment. Else, the gas sensor gives LOW pulse to the Arduino, then LCD wouldthen show the “All Clear” message.

STEP 1:



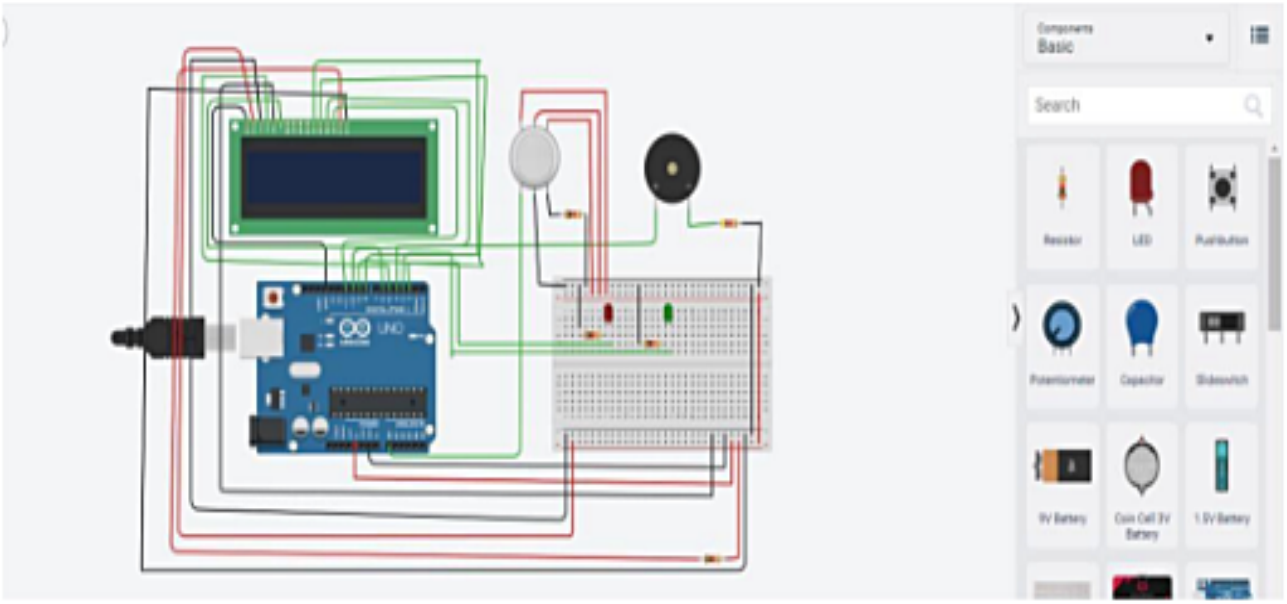
STEP 2:



Steps :

1. Connect Arduino 5V to positive power rail
2. Connect Arduino GND to negative power rail
3. Connect Arduino A0 to gas sensor B1
4. Connect gas sensor A1, H2, A2 to positive power rail
5. Connect gas sensor H2 to ground
6. Connect gas sensor B2 to 4.7k ohms resistor, then to ground
7. Connect piezo positive terminal to Arduino pin 4
8. Connect piezo negative terminal to 1k ohms resistor, then to ground
9. Connect the cathodes of the two LEDs to 1k ohms resistor, then to ground
10. Connect the anode of the red LED to Arduino pin 2

STEP 3:



1. Connect LCD ground, contrast, and LED cathode to ground
2. Connect LCD anode to 1k ohms resistor, then to the positive power rail
3. Connect LCD power to the positive power rail
4. Connect LCD register select to Arduino pin 5
5. Connect LCD read/write to ground
6. Connect LCD enable to Arduino pin 6
7. Connect LCD terminal 4,5,6,7 to Arduino pin 8,9,10,11

Step 4

Code

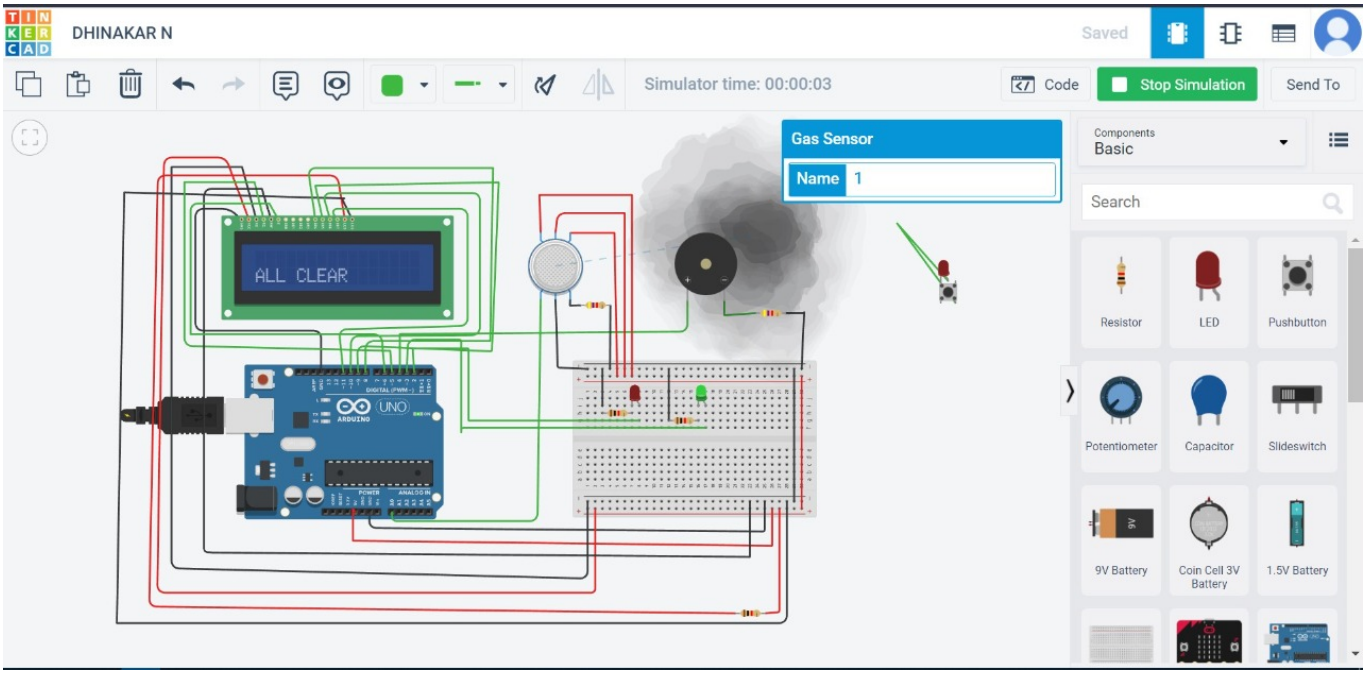
```
#include <LiquidCrystal.h>
LiquidCrystal lcd(5,6,8,9,10,11);
int redled = 2; int
greenled = 3; int
buzzer = 4; int sensor
= A0; int sensorThresh
= 400;
void setup()
{ pinMode(redled,
OUTPUT);
pinMode(greenled,OUTPUT);
pinMode(buzzer,OUTPUT);
pinMode(sensor,INPUT);
Serial.begin(9600);
lcd.begin(16,2);
} void
loop() {

int analogValue = analogRead(sensor);
Serial.print(analogValue);
if(analogValue>sensorThresh)
```

```
{
digitalWrite(redled,HIGH);
digitalWrite(greenled,LOW);
tone(buzzer,1000,10000);
lcd.clear();
lcd.setCursor(0,1);
lcd.print("ALERT");
delay(1000); lcd.clear();
lcd.setCursor(0,1);
lcd.print("EVACUATE");
delay(1000);
} else {
digitalWrite(greenled,HIGH);
digitalWrite(redled,LOW);
noTone(buzzer); lcd.clear();
lcd.setCursor(0,0);
lcd.print("SAFE");
delay(1000); lcd.clear();
lcd.setCursor(0,1);
lcd.print("ALL CLEAR");
delay(1000);
}
```

Here is the Arduino Code for Gas Detecting Alarm System.

Step 5

Run the simulation



When you run the simulation, the LCD should be able to display both safe and evaluate messages, while the piezo buzzer should be able to beep if the gas sensor detect any gas leaks.

9.ADVANTAGE

•Get real-time alerts about the gaseous presence in the atmosphere
• Prevent fire hazards and explosions
• Supervise gas concentration levels
• Ensure worker’s health
• Real-time updates about leakages
• Cost-effective installation
• Data analytics for improved decisions
• Measure oxygen level accuracy
• Get immediate gas leak alerts
• Because of the very narrow 0.3 nm line width of the laser emission, there is no interference from other gases.
• Response times are in the order 1 second. This allow for fine resolution/control when making process measurements.
• The intense laser light concentrated at the absorption wavelength enables path lengths up to 1 km to be measured.
• An average measurement is taken over the total path so that a narrow plume of gas has less chance of escaping detection.
• The range of measurement can be up to 4 orders of magnitude, enabling concentrations of 0.1 ppm to 1000 ppm to be measured.
• Because of the internal reference cell, the system is self calibrating.
• There is no ‘poisoning’ or degradation of the instrument with long term exposure to a gas.
• Can easily be conformed to be ‘Intrinsically Safe’.
• Low maintenance and low operating costs.
• Reliable technology.

DISADVANTAGE

- Poor stability and greater environmental impact; in particular, the selectivity of each sensor is not * and the output parameters cannot be determined. Therefore,it should not be used in places where accurate measurement is required.
- Only one gas can be measured with each instrument. When heavy dust, steam or fog blocks the laser beam, the system will not be able to take measurements. This is also the case when a person or vehicle blocks the path.
- It requires air or oxygen to work
- It can be poisoned by lead, chlorine and silicon
- It gets reacted due to heating of wire
- It is difficult to know failure modes unless very advanced methods of monitoring are used.
- All the gases do not have infrared absorption.
- Sequential monitoring is slower on multi-point analyzers.
- It requires more user expertise.
- It is susceptible to contaminants and changes due to environment conditions.
- Non-linear response affects sensor complexity.

10.FUTURE SCOPE

The Smart Home application, which includes a gas monitoring system, is being promoted by major Indian cities.The Internet of Things transforms a drone into a gas detection sensor, enhancing industrial safety.
Including an Automatic Shut-Off device, which will shut off the gas supply whenever it detects gas leakage, is another significant future possibility.This system can be used in hotels, industries, and anywhere else that uses LPG cylinders.Applications like furnaces, boilers, gas welding, gas cutting, steel plants, metallurgical industries, food processing, glass, plastic, pharmaceuticals, and aerosol manufacturing can all benefit from this system.This system can be used to track all of the cylinders that are used in hospitals because they need to be as safe as possible for patients.Oxygen, carbon dioxide, and nitrogen oxide cylinders are some of the cylinders used.The risk of accidents is high because so many students are naive.As a result, schools and colleges can also benefit from our system.There are numerous well-established laboratories at colleges, including chemistry and pharmaceutical laboratories with gas burners.Gas cylinders are required for numerous medical equipment.

12. CONCLUSION

Serious accidents that result in material losses and human injuries are caused by gas leaks.
Poor equipment maintenance and a lack of public awareness are the primary causes of gas leaks.Therefore, LPG leakage detection is essential for accident prevention and human life preservation.The LPG leakage detection and alert system was presented in this paper.When LPG leakage is detected, this system activates a buzzer and LED to notify individuals.This system is straightforward yet dependable.