

# GAS AND SMOKE DETECTION SYSTEM USING ARDUINO

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# PRESENTATION OUTLINE

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- Literature review
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- Circuit Diagram
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- CONCLUSION

# PROJECT OBJECTIVES

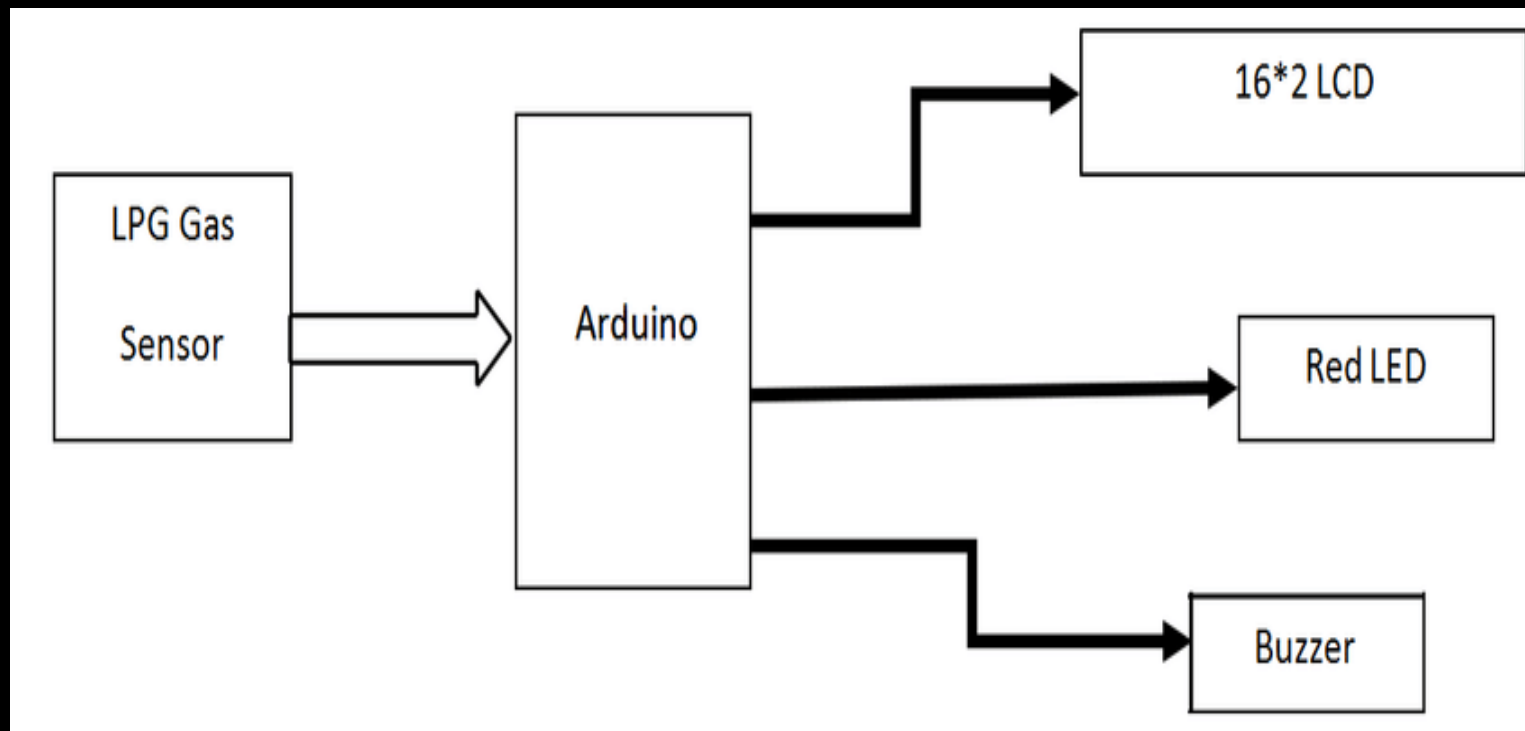
- To study the working principle of gas and smoke detector system.
- To design and construct of the gas and smoke detector system and control system using Arduino.
- To implement gas and smoke design in the project.
- A smoke system is number of devices working together to detect and warn people through visual and audio appliances when smoke and carbon monoxide.
- A smoke detector is a device that senses smoke,gas.

# LITERATURE REVIEW:-

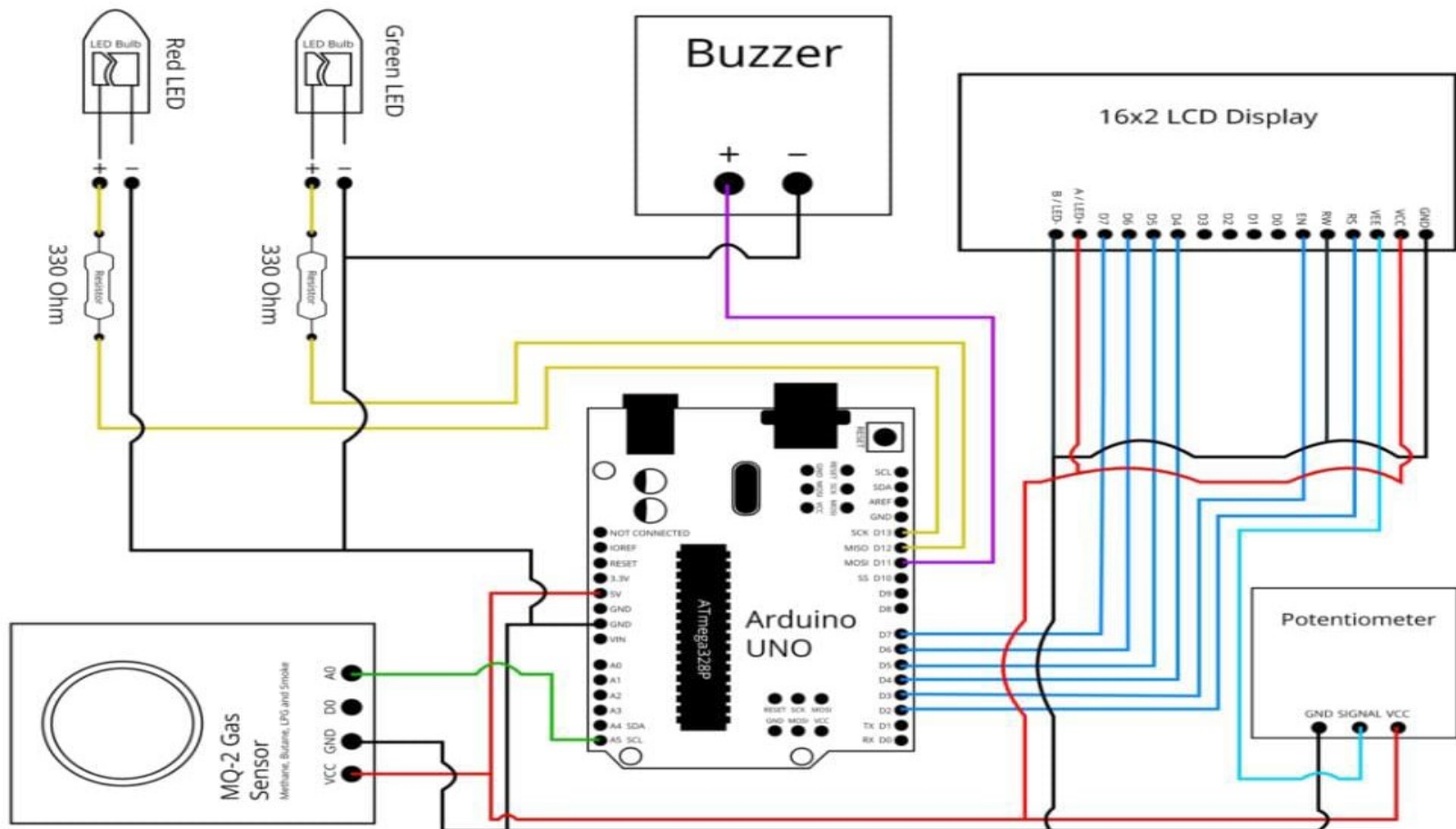
Mahalingam, et al (2015) designed and implemented an Economical Gas Leakage Detector. In this project when the sensor detects no gas in the air, it produces a voltage below 1.2V on the output pin, which is connected to port RAO of the microcontroller. But when the sensor detects the present of the gas in the air, the voltage rises above 1.2V. The voltage ranges varies from 1.2V to 5V.

It is depended on the amount of gas sensed. If the value of voltage falls within the range of 1.2V to 4V. The microcontroller activates a low level early warning by turning-on LEDs and buzzer. The low level warning signal is maintained for 100ms (slow mode) before it stops. This loop is repeated until the voltage drops to 1.2V and below or rises to beyond 4V. If the voltage rises above 4V, then the high level dangerous warning sign is activated by sending signals to turn-on LEDs and the buzzers (BUZ1 and BUZ2) respectively. These signals are supplied for 50ms (fast mode) and then stop. This step is repeated until the voltage drops below 4V. The system remains active until the gas level is reduced below the acceptable limit of less than 400ppm.

# BLOCK DIAGRAM :-



# CIRCUIT DIAGRAM:-



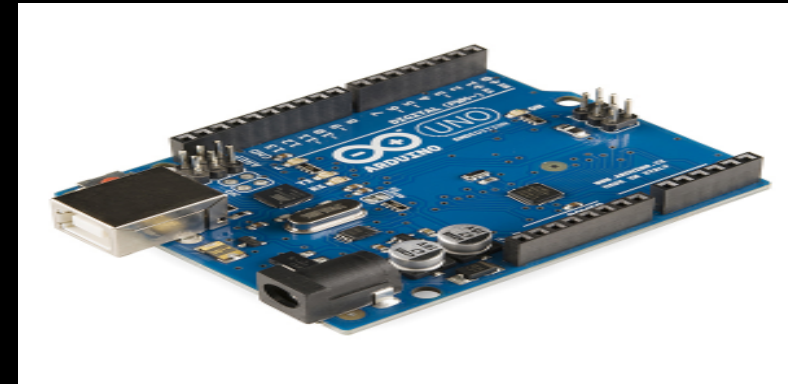
# COMPONENTS USED:-

- ARDUINO UNO
- LCD DISPLAY
- BREAD BOARD
- GAS SENSOR
- PIEZO SPEAKER
- LED LIGHT
- RESISTORS
- CONNECTING WIRES



# ARDUINO UNO:-

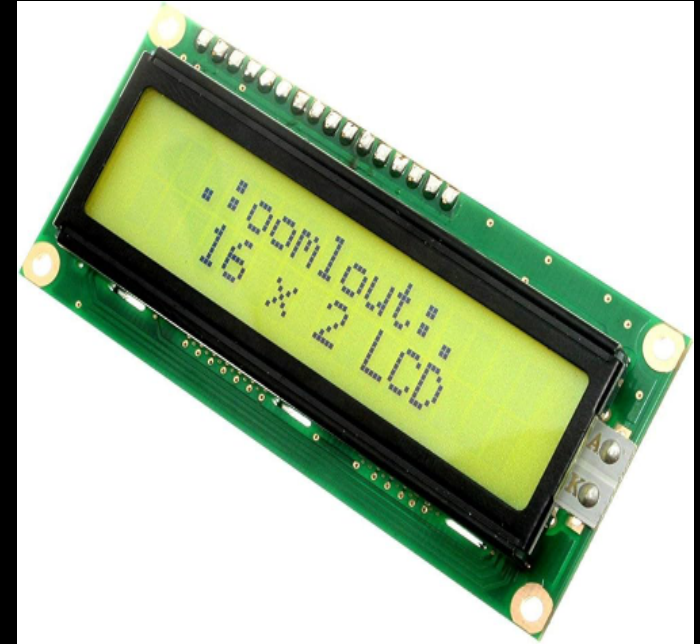
- The Arduino UNO is an open source microcontroller board based on the Microchip ATmega328P microcontroller(MCU) and developed by Arduino.cc and initially released in 2010.
- The microcontroller board is equipped with sets of digital and analog input/output (I/O) pins that may be interfaced to various 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 , via a type B cable.
- Memory – 2 KB SRAM
- Storage – 32 KB Flash  
1 KB EEPROM



# LCD DISPLAY:-

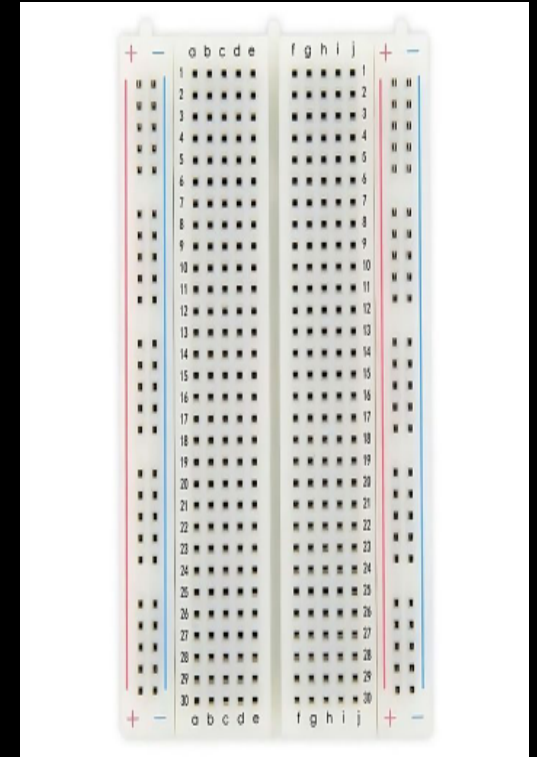
The term LCD stands for liquid crystal display . It is One kind of electronic display module used in an extensive range of applications like various circuits & Devices like mobile phones, calculators, TV etc., These displays are mainly preferred for multi-segment light-emitting diodes and seven segments.

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.



# BREAD BOARD:-

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



# GAS SENSOR :-

- A gas detector is a device that detects the presence of gases in an area, often as part of a safety system. area where the leak is occurring, giving them the opportunity to leave. This type of device is important because there are many gases that can be harmful to organic life, such as humans or animals.



# PIEZO SPEAKER :-

- A piezoelectric speaker (also known as a piezo bender due to its mode of operation, and sometimes colloquially called a "piezo", buzzer, crystal loudspeaker or beep speaker) is a loudspeaker that uses the piezoelectric effect for generating sound. The initial mechanical motion is created by applying a voltage to a piezoelectric material, and this motion is typically converted into audible sound using diaphragms and resonators.



# LED LIGHT :-

- 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.[5] White light is obtained by using multiple semiconductors or a layer of light-emitting phosphor on the semiconductor device.



# PROGRAM :-

```
#include <LiquidCrystal.h>
LiquidCrystal lcd(7, 6, 5, 4, 3, 2);
int RLED = 13;
int GLED = 12;
int BUZ = 11;
int MQ2Pin = A5;
int MQ2Threshold = 100;
void setup()
{
  pinMode(RLED, OUTPUT);
  pinMode(BUZ, OUTPUT);
  pinMode(MQ2Pin, INPUT);
  Serial.begin(9600);
```



```
lcd.begin(16,2);  
}  
void loop()  
{  
int MQ2Sensor = analogRead(MQ2Pin);  
Serial.print("Pin A0: ");  
Serial.println(MQ2Sensor);  
lcd.print("Smoke:");  
lcd.print(MQ2Sensor-50);  
// Checks if it has reached the threshold value  
if (MQ2Sensor-50 > MQ2Threshold)  
{  
digitalWrite(RLED, HIGH);  
lcd.setCursor(0, 2);  
lcd.print("Alert....!!!");  
digitalWrite(12, LOW);  
}
```



```
tone(BUZ, 1000, 200);  
}  
else  
{  
  digitalWrite(RLED, LOW);  
  digitalWrite(12, HIGH);  
  lcd.setCursor(0, 2);  
  lcd.print(".....Normal.....");  
  noTone(BUZ);  
}  
delay(500);  
lcd.clear();  
}
```

## APPLICATIONS :-

- It is suitable for detecting of LPG , natural gas, town gas.
- Avoid the noise of alcohol They are used in gas leakage detecting equipment in family and industry.
- and cooking fumes cigarette smoke.

## **ADVANTAGES :-**

- Detects products of combustion.
- Sensitive enough to detect level of gases.
- Detects gases prior to reaching lethal levels.
- Produced between the occurrences of detectable level and detectable heat levels.

## CONCLUSION:-

- Smoke detector is one of the easiest and low cost.
- Most of industries use it, because it work fastly to protect and most effective.
- In future the use of gas and smoke detection will increase.

The image features a solid black background. At the top, there is a horizontal band of vibrant, wavy colors including yellow, orange, red, and green, which appears to be a stylized representation of a sunset or a digital graphic element. Centered in the black area is a light gray rectangular box containing the text "THANK YOU" in a white, bold, sans-serif font.

**THANK YOU**