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INTRODUCTION

The project is a Smart Gas/Smoke Detector that is capable of detecting LPG, smoke, as well as other poisonous gasses like carbon monoxide. By using an app, you can monitor the concentration of these gasses in ppm on your mobile phone. MQ-2 is a chemiresistor as its working is based on the change in resistance of the sensing material when exposed to gasses. The MQ2 gas sensor operates on 5V DC and consumes approximately 800mW. It can detect LPG, Smoke, Alcohol, Propane, Hydrogen, Methane and Carbon Monoxide concentrations ranging from 200 to 10000 ppm. The MQ-2 Sensor is connected to 5V. The threshold value is kept at 210, that is, when the output value is 210, the buzzer rings and 'GAS DETECTED' is printed on the mobile app. HC-06 Bluetooth Module is used for sending the output values to the mobile app.

Apart from the MQ-2 sensor, an HC-06 Bluetooth module is used to send the output values to the app.

The components used are

- Arduino UNO
- MQ-2 Gas Sensor
- HC-06 Bluetooth Module
- Buzzer
- Jumper Wires

CODE

```
#include<SoftwareSerial.h>
#define MQ2pin (0)
int buzzer = 10;
int sensorValue;  //variable to store sensor value
SoftwareSerial bt(3,2);

void setup()
{
  bt.begin(9600);
  Serial.begin(9600);
  pinMode(buzzer, OUTPUT);
  delay(5000);
}


void loop()
{
  sensorValue = analogRead(MQ2pin); // read analog input pin 0
  bt.write(sensorValue);
  Serial.println(sensorValue);
  if(sensorValue > 210)
  {
    tone(buzzer, 500, 2000);
  }
  else
  {
    noTone(buzzer);
  }
  delay(2000); // wait 2s for next reading
}
```

MIT APP INVENTOR BLOCKS

```
when ListPicker1 .BeforePicking
do   set ListPicker1 . Elements to   BluetoothClient1 . AddressesAndNames
```

```
when ListPicker1 .AfterPicking
do   if   call BluetoothClient1 .Connect
              address   ListPicker1 . Selection
     then  set connected . Text to " CONNECTED "
```

```
when Clock1 .Timer
do   if   BluetoothClient1 . IsConnected and call BluetoothClient1 .ReceiveUnsigned1ByteNumber > 0
     then set value . Text to call BluetoothClient1 .ReceiveUnsigned1ByteNumber
          if   call BluetoothClient1 .ReceiveUnsigned1ByteNumber ≥ 210
          then set danger . Text to " GAS/SMOKE DETECTED!! "
               call Sound1 .Play
          else set danger . Text to " SAFE "
               call Sound1 .Stop
```

CIRCUIT DIAGRAM
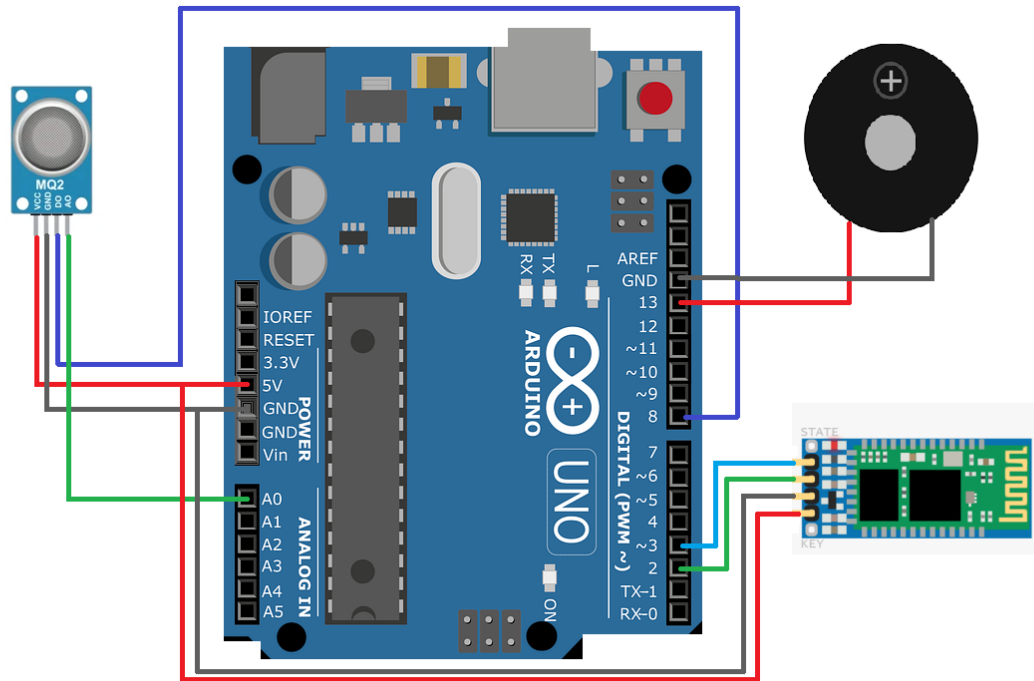
REAL LIFE APPLICATIONS

The number of LPG burn incidents are increasing day by day. Our project can be used in households to prevent LPG leaks. Its connected feature makes it more convenient to use. The real time gas concentration can be monitored from a mobile phone using the app.

Additionally, it can also be used as a fire alarm in apartments, offices, schools and other buildings as the sensor can detect smoke. Apart from smoke and LPG, it can detect poisonous gasses like Carbon Monoxide. Carbon monoxide is extremely poisonous, and even 70 ppm of carbon monoxide can cause death. Since Carbon Monoxide has no odor, color or taste, it cannot be detected by our senses. This means that dangerous concentrations of the gas can build up indoors and humans have no way to detect the problem until they become ill. The sources of carbon monoxide in homes are:
- Clothes dryers
- Water heaters
- Furnaces or boilers

- Fireplaces, both gas and wood burning
- Gas stoves and ovens
- Motor vehicles

Hydrogen, methane,propane are some other gasses this sensor can detect. Hydrogen can be produced from a variety of domestic resources, such as natural gas, nuclear power, biomass, and renewable power like solar and wind. These qualities make it an attractive fuel option for transportation and electricity generation applications. It can be used in cars, in houses, for portable power, and in many more applications. This project can be used for detecting hydrogen gas leaks in the future.

RESULT AND INFERENCE

⬡ The app shows all the bluetooth devices available to connect. It shows 'CONNECTED' once the device is connected.

⬡ The gas concentration in ppm is being printed on the app.

⬡ When the sensor reading is greater than 210, the buzzer rings and the message 'GAS/SMOKE DETECTED' is printed on the screen.

⬡ If the sensor reading is less than 210, it is printed 'SAFE' on the mobile screen.

<u>CONCLUSION</u>

The project is working as mentioned above. In conclusion, the efficiency of this project can be increased by

- ⬡ Replacing the bluetooth module with a long range wifi module as the bluetooth module has very less range whereas the range provided by long range wifi modules can be up to 5 kilometers.
- ⬡ Adding more features to the app like multi device connectivity.
- ⬡ Adding an LED screen next to the sensor to display the sensor value.