Experiment 8

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Semester: 6th **Date of Performance: 01/05/2023**
Subject Name: IOT Lab **Subject Code: 20CSP-358**

AIM:

Check the type of gas present in the air using the Gas Sensor (MQ 135) and show output.

OBJECTIVE:

- Learn about IoT based simulations.
- Testing and model in IoT based simulation platform

HARDWARE REQUIREMENT:

- Arduino Uno R3 Board
- Jumper Wires
- MQ 135 Air Quality sensor module
- Breadboard
- Power cord

SOFTWARE REQUIREMENT:

- Windows 10 or higher
- Web Browser
- Arduino IDE

INTRODUCTION:

Arduino:-

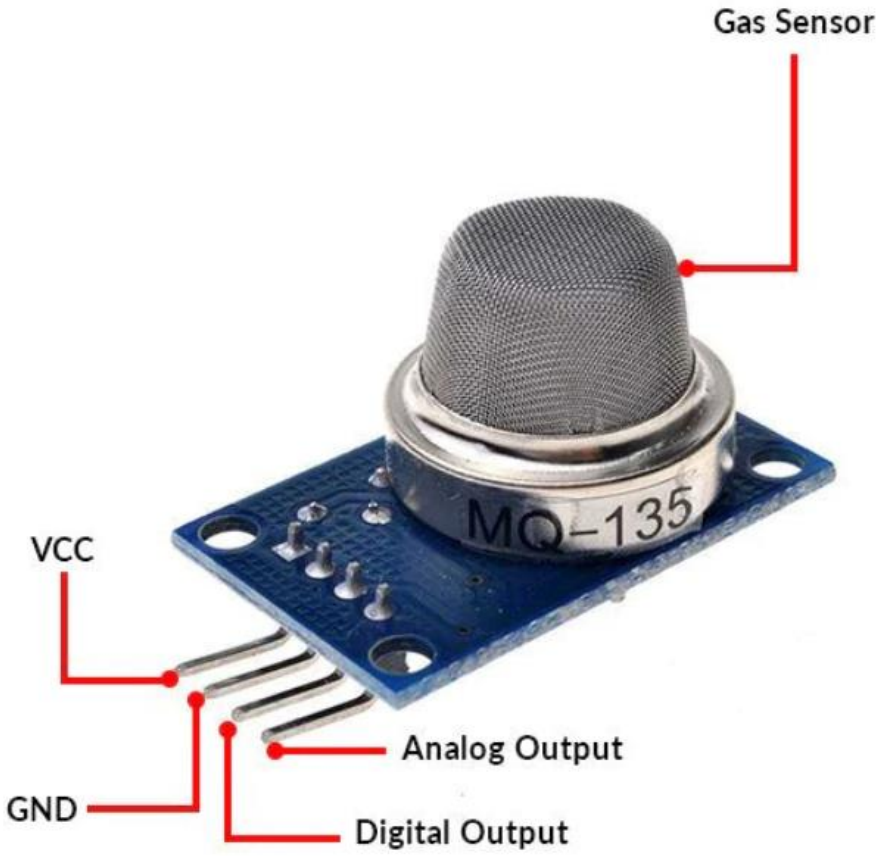
It is an open-source electronics platform. It consists ATmega328 8-bit Micro controller. It can be able to read inputs from different sensors & we can send instructions to the micro controller in the Arduino. It provides Arduino IDE to write code & connect the hardware devices like Arduino boards & sensors.

MQ 135 Air Quality Sensor:-

MQ-135 sensor belongs to the MQ series that are used to detect different gasses present in the air. The MQ-135 sensor is used to detect gases such as NH3,NOx, alcohol, Benzene, smoke,CO2 ,etc. steel exoskeleton houses a sensing device within the gas sensor module.

This sensor has 4 pins:

MQ 135 Gas Sensor:-



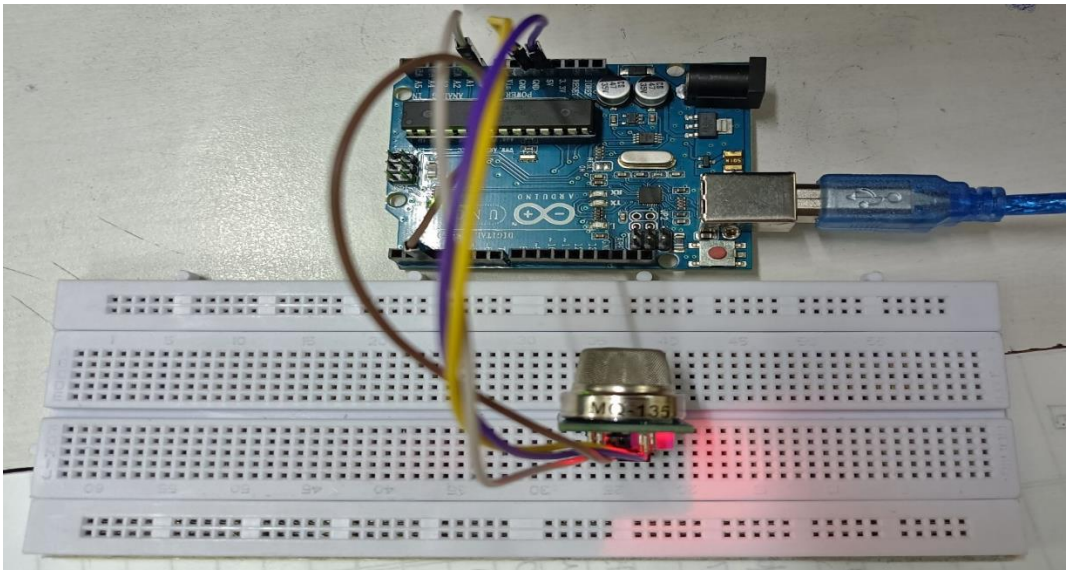
1. **VCC :** It is the power supply pin of the Gas Detection sensor that can be connected to 5V of the supply**.**

2. **GND:** It is the ground pin of the board and it should be connected to the ground pin of the Arduino.

3. **DOUT:** It is the digital output pin of the board, output low indicates gas or smoke is not present in the atmosphere and output high indicates gas or smoke is present in the atmosphere.

4. **AOUT:** It is the Analog output pin of the board that will give us an analog signal which will vary between vcc and ground based on the gas level detected.

CIRCUIT DIAGRAM:



[In Lab Representation of Circuit]

MQ-135 Module pin connection with Arduino Uno:

VCC	5V
GND	GND
AO	A0
DO	Pin 2

On the serial monitor, you can see the values of the analog pin being detected. Currently, in my case, they are around about 150 which indicates normal air.

- Normal air returns approximately 100-150
- Alcohol returns approximately 700
- Lighter gas returns approximately 750

CODE BLOCK :-

```
int sensorValue;
int digitalValue;

void setup()
{
  Serial.begin(9600); // sets the serial port to 9600
  pinMode(13, OUTPUT);
  pinMode(2, INPUT);
}

void loop()
{
  sensorValue = analogRead(0); // read analog input pin 0
  digitalValue = digitalRead(2);
  if (sensorValue > 400)
  {
    digitalWrite(13, HIGH);
  }
  else
    digitalWrite(13, LOW);
  Serial.println(sensorValue, DEC); // prints the value read
  Serial.println(" Normal Air ")
  Serial.println(digitalValue, DEC);
```

```
    delay(1000);
}
```

OUTPUT :