IOT-BASED GAS LEAK DETECTION AND ALEART SYSTEM

AIM

To design and simulate a Gas Detection and Alert System using ESP32 in which continuously monitors gas concentration using a gas sensor and activates an LED and buzzer when the gas level exceeds a predefined threshold.

PROCEDURE

STEP 1: Start the program

Initialize variables and pin assignments

- o Assign gas sensor to analog pin 34
- o Assign LED to pin 2
- o Assign buzzer to pin 22
- o Set gas detection threshold value

STEP 2: Initialize system in setup()

- o Start serial communication at 115200 baud rate
- o Configure LED pin as OUTPUT
- o Configure gas sensor pin as INPUT
- o Configure buzzer using PWM (LEDC) for ESP32

STEP 3: Begin infinite loop (loop())

STEP 4: Read gas sensor value

- o Read analog value from gas sensor pin 32
- o Store the value in a variable

STEP 5: Display sensor value

- o Print the gas sensor value on the Serial Monitor

STEP 6: Compare sensor value with threshold

- o If gas sensor value is greater than the threshold:
  - Display warning message on Serial Monitor
  - Turn ON the LEDTurn ON the buzzer

Else:

- Turn OFF the LED
- Turn OFF the buzzer

STEP 7: Delay

STEP 8: End The Program

CODING

```
#define GAS_SENSOR_PIN 34

int threshold=200;

int ledPin=2;

int buzzerPin=22;

void setup(){

  pinMode(buzzerPin,OUTPUT);

Serial.begin(115200);

pinMode(ledPin, OUTPUT);

pinMode(GAS_SENSOR_PIN,INPUT);

}

void loop(){

  tone(buzzerPin,1000);

  delay(1000);

  noTone(buzzerPin);

  delay(1000);

digitalWrite(ledPin, HIGH);

delay(1000);

digitalWrite(ledPin, LOW);

delay(1000);

int gasValue=analogRead(GAS_SENSOR_PIN);

Serial.print("Gas Sensor Value:");

Serial.println(gasValue);
```
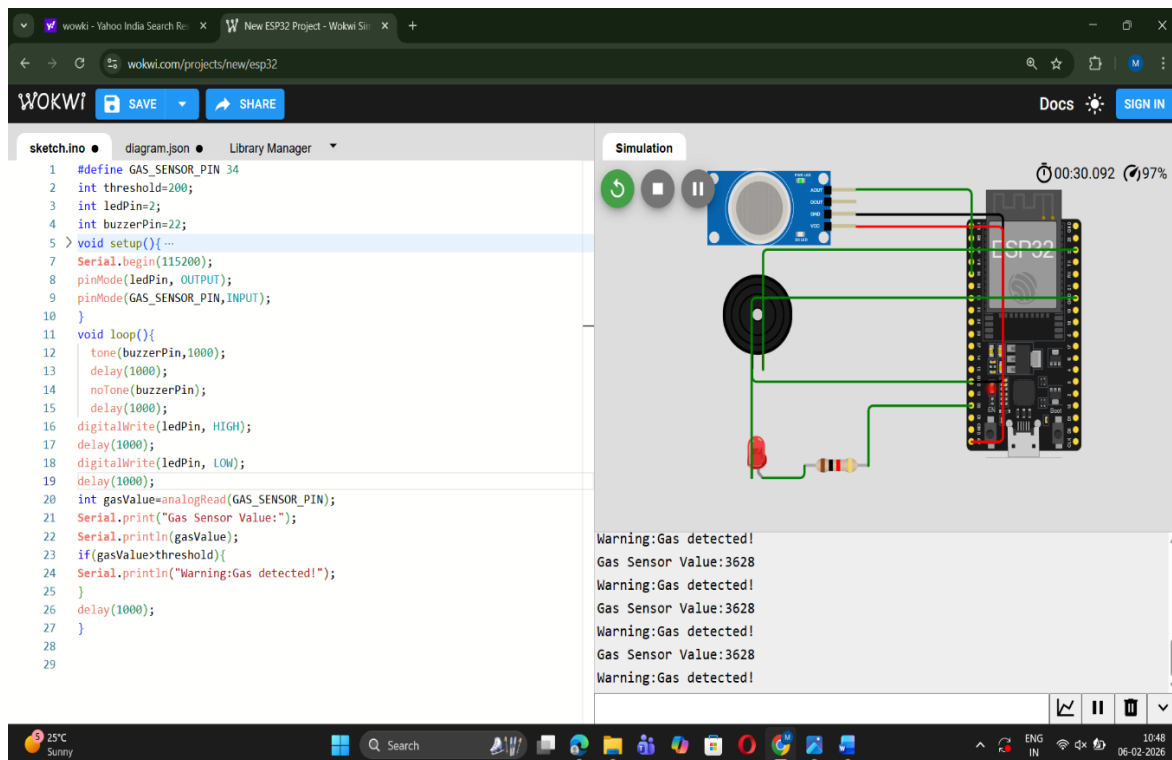
```
if(gasValue>threshold){

Serial.println("Warning:Gas detected!");

}

delay(1000);

}
```
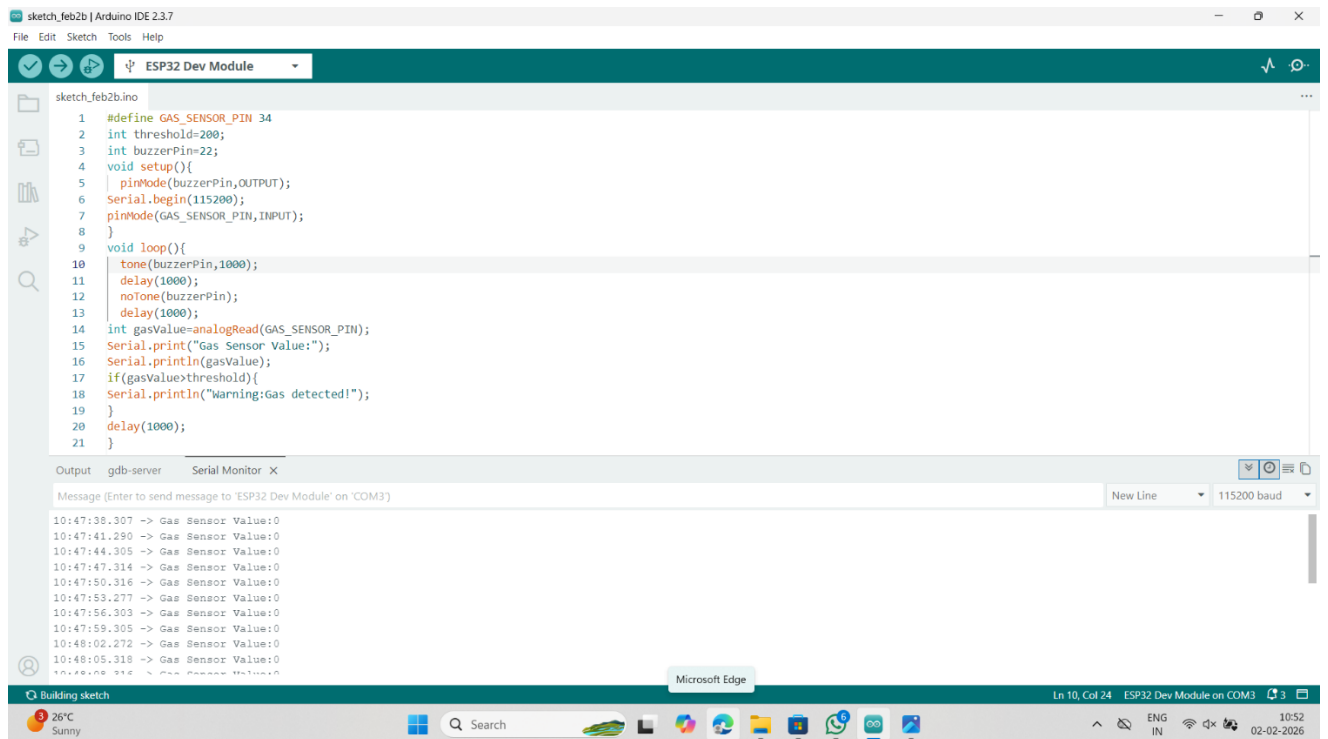
OUTPUT

IN STIMULATION

IN ARDIUNO USING HARDWARE


```
#define GAS_SENSOR_PIN 34
int threshold=200;
int buzzerPin=22;
void setup(){
  pinMode(buzzerPin,OUTPUT);
Serial.begin(115200);
pinMode(GAS_SENSOR_PIN,INPUT);
}
void loop(){
  tone(buzzerPin,1000);
  delay(1000);
  noTone(buzzerPin);
  delay(1000);
int gasValue=analogRead(GAS_SENSOR_PIN);
Serial.print("Gas Sensor Value:");
Serial.println(gasValue);
if(gasValue>threshold){
Serial.println("Warning:Gas detected!");
}
delay(1000);
}
```
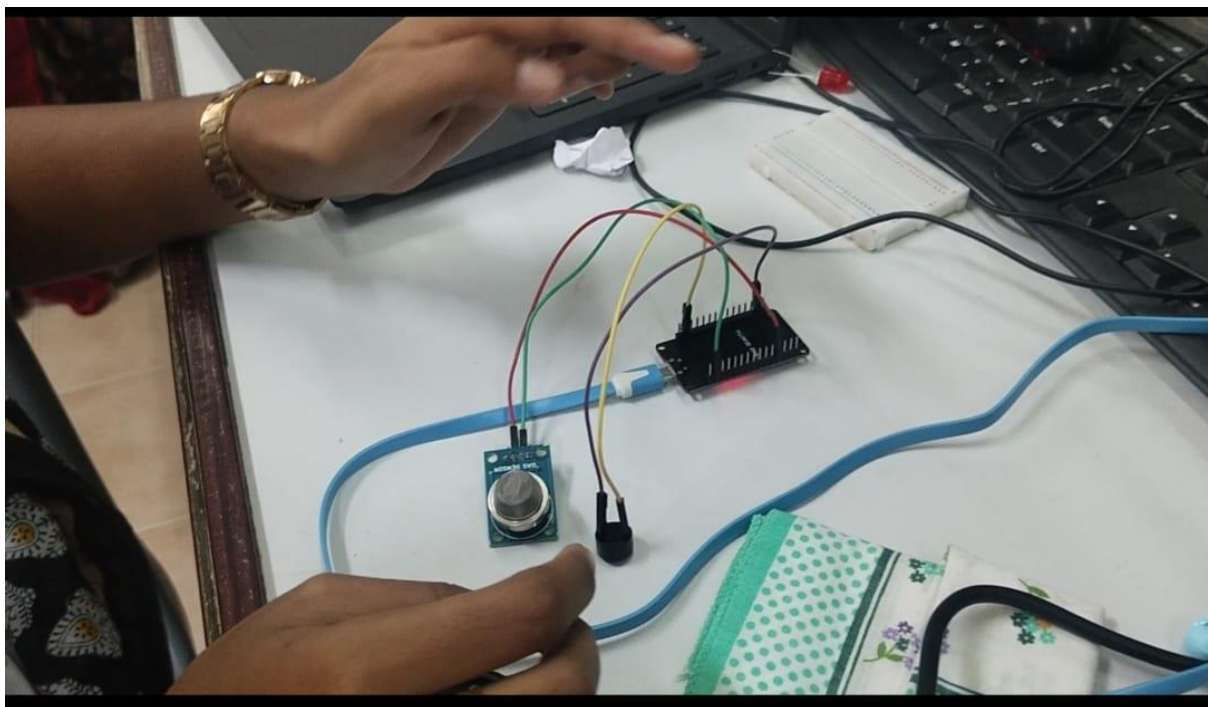
```
10:47:38.307 -> Gas Sensor Value:0
10:47:41.290 -> Gas Sensor Value:0
10:47:44.305 -> Gas Sensor Value:0
10:47:47.314 -> Gas Sensor Value:0
10:47:50.316 -> Gas Sensor Value:0
10:47:53.277 -> Gas Sensor Value:0
10:47:56.303 -> Gas Sensor Value:0
10:47:59.305 -> Gas Sensor Value:0
10:48:02.272 -> Gas Sensor Value:0
10:48:05.318 -> Gas Sensor Value:0
```

RESULT

The gas detection system was successfully simulated .When the gas sensor value exceeded the threshold, the LED and buzzer were activated and a warning message was displayed. When the value dropped below the threshold, the alert devices turned OFF.