



Sri Lanka Technological Campus

In-Car Carbon Monoxide Level Detector and Fire Alarm

Presented by Group 13



Meet the Group

Nadun



**Nadun
Dilanka**



**Saliya
Ranasgalla**

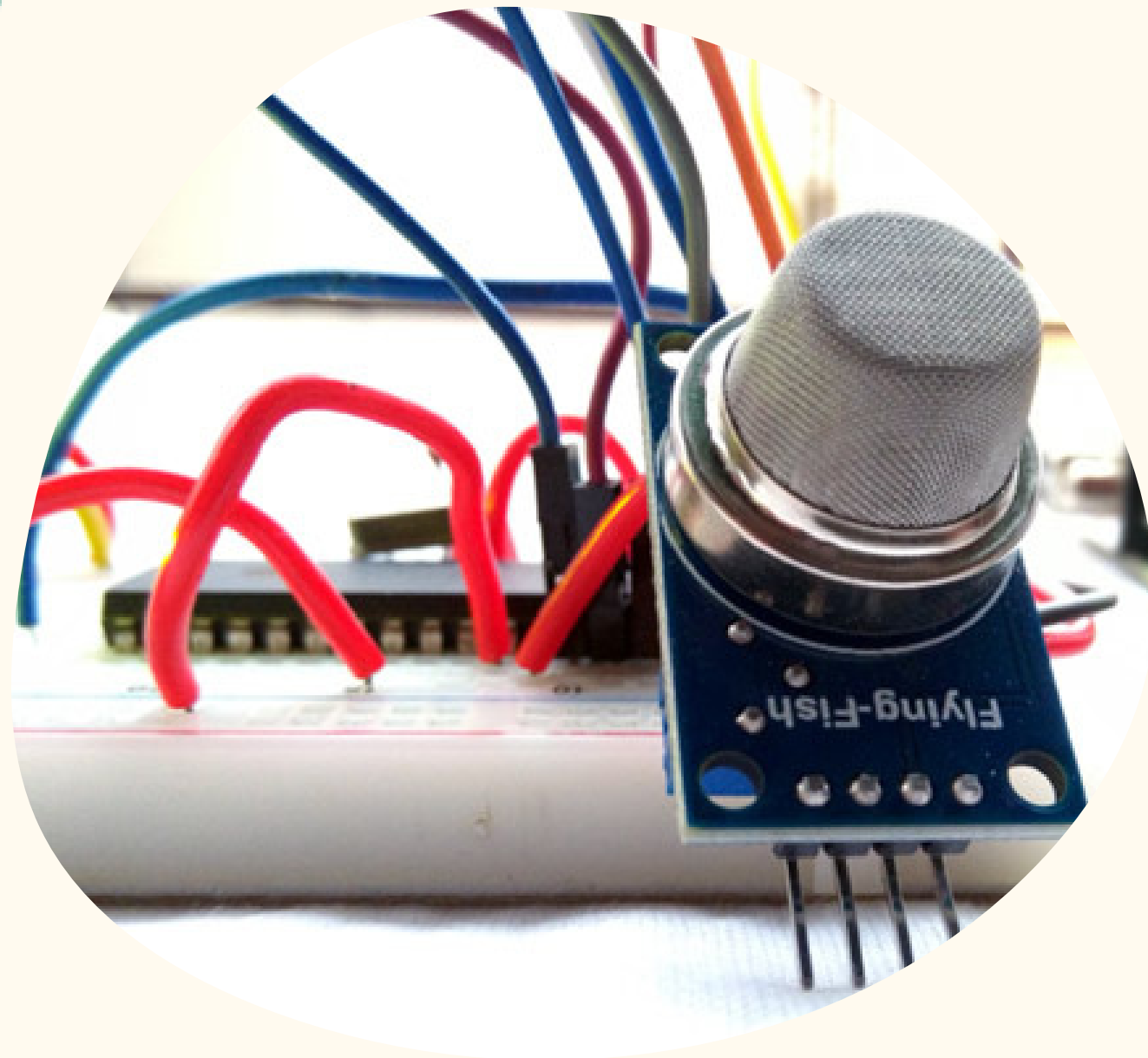


**Tharusha
Induwara**



**Migara
Perera**

Introduction



We have created an in car carbon monoxide level detector with a display to show the ppm value of carbon monoxide which present in the car.

Many people are sleeping inside the car with fully closed window and with air conditioner sometimes this may cause unconsciousness death.

Goals



Our First Goal

Create a microprocessor-based oxygen level detector and fire alarm



Our Second Goal

Get information using a sensor



Our Third Goal

Display the ppm value of the carbon monoxide gas and alarm

Nadun

Methodology

General Overview

The two main components of this project are the MQ-2 sensor and the PIC16F877A microcontroller.

Why PIC Microcontroller?

- Low Power Consumption
- High Performance
- Can be programmed and modified
- Best replacement for Arduino

Why MQ-2 Gas Sensor?

- Domestic gas leakage detection
- Combustible gas leakage detection
- Easily Applicable
- Low Price and Quick Response

Saliya



MICROCHIP

Code for MQ-2 gas sensor interfacing with pic microcontroller

```
// LCD module connections
sbit LCD_RS at RD2_bit;
sbit LCD_EN at RD3_bit;
sbit LCD_D4 at RD4_bit;
sbit LCD_D5 at RD5_bit;
sbit LCD_D6 at RD6_bit;
sbit LCD_D7 at RD7_bit;
```

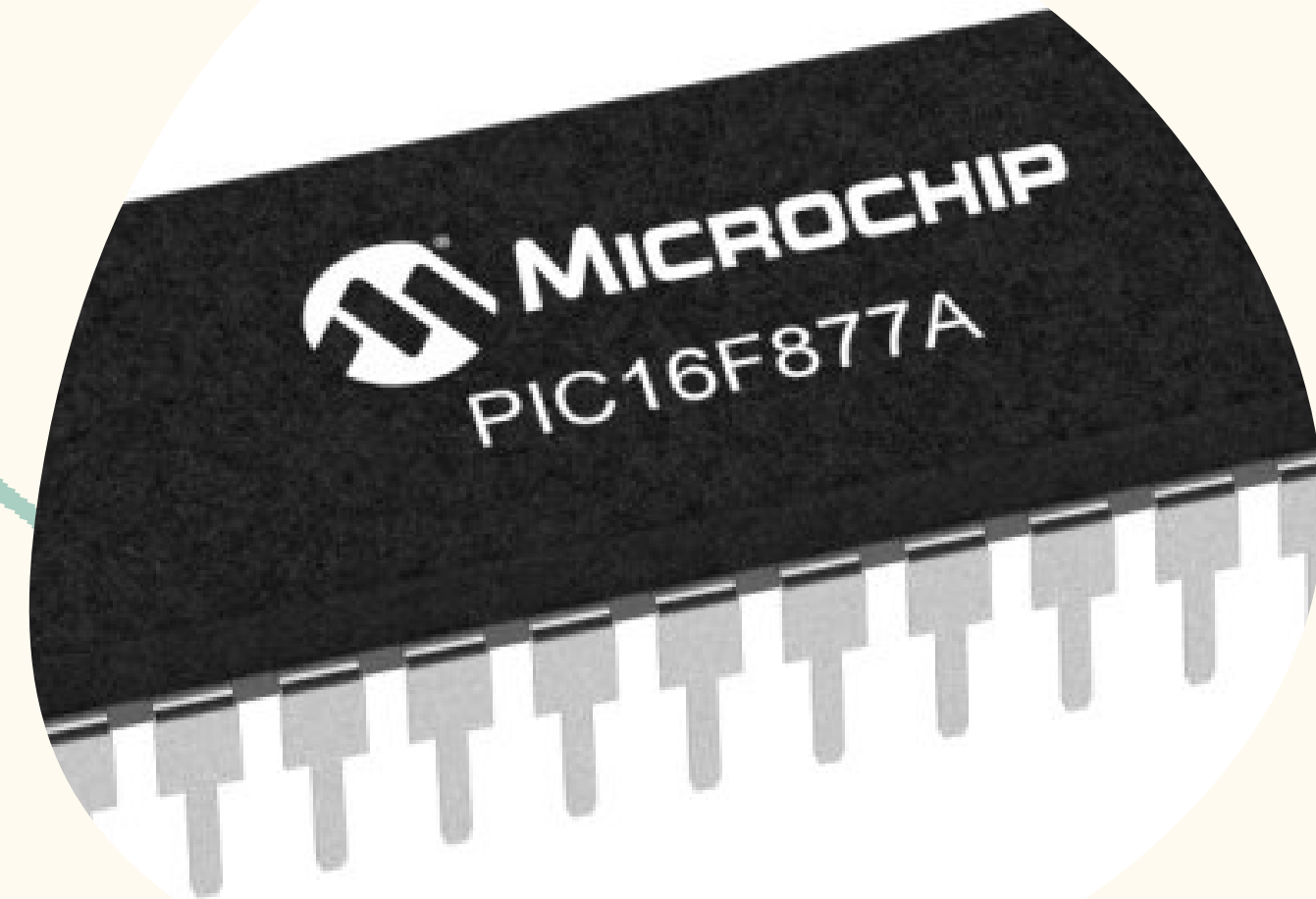
```
sbit LCD_RS_Direction at TRISD2_bit;
sbit LCD_EN_Direction at TRISD3_bit;
sbit LCD_D4_Direction at TRISD4_bit;
sbit LCD_D5_Direction at TRISD5_bit;
sbit LCD_D6_Direction at TRISD6_bit;
sbit LCD_D7_Direction at TRISD7_bit;
```

```
//////// MQ-2 gas sensor interfacing with pic microcontroller //////////
```

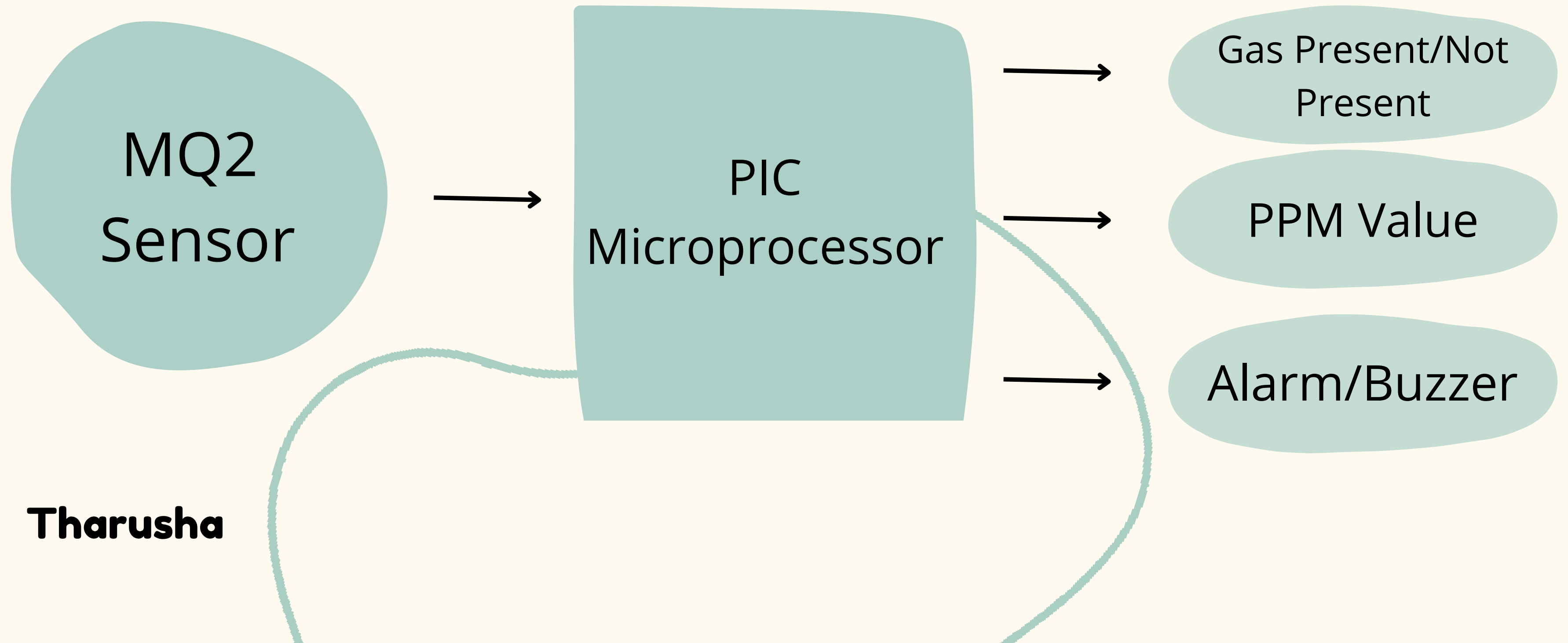
```
int gas_value;
char text[10];
void main(void)
{
```

```
    ADC_Init(); // it will initialize the adc module of pic16f877a microcontroller
    Lcd_Init(); // Initialize LCD
    Lcd_Cmd(_LCD_CLEAR); // Clear display
    Lcd_Cmd(_LCD_CURSOR_OFF); // Cursor off
    Lcd_Out(1,1,"In-Car Carbon Monoxide Level Detector" ); // Write text in first
    delay_ms(2000);
    Lcd_Cmd(_LCD_CLEAR); // Clear display
```

```
    while(1)
    { // Endless loop
        gas_value = ADC_Read(0); // It will read the gas value of sensor
        if( gas_value > 400 )
            Lcd_Out(1,1, "Gas detected" );
        else
            Lcd_Out(1,4, "No Gas " );
        intToStr(gas_value, Ltrim(text));
        Lcd_Out(2,1, text );
        delay_ms(1000);
    }
}
```



Flow Chart



Hardware Design

Tharusha



Budget

Tharusha

Component

Quantity

Price

MQ 2 Sensor

1

1020

1K Resistor

5

40

0.47nF Capacitor

1

16

47nF Capacitor

1

18

1N5817 Diode

1

30

2N3904

1

200

16 X 2 LCD

1

750

PIC16F877A

1

1250

10K Potentiometer

1

375

LED

1

20

10K Potentiometer

1

300

Total

5269

Gantt Chart

Tharusha

TASKS

SEM 3

SEM 4

SEM 5

SEM 6

SEM 7

Research

Identify the components and method

Circuit Design

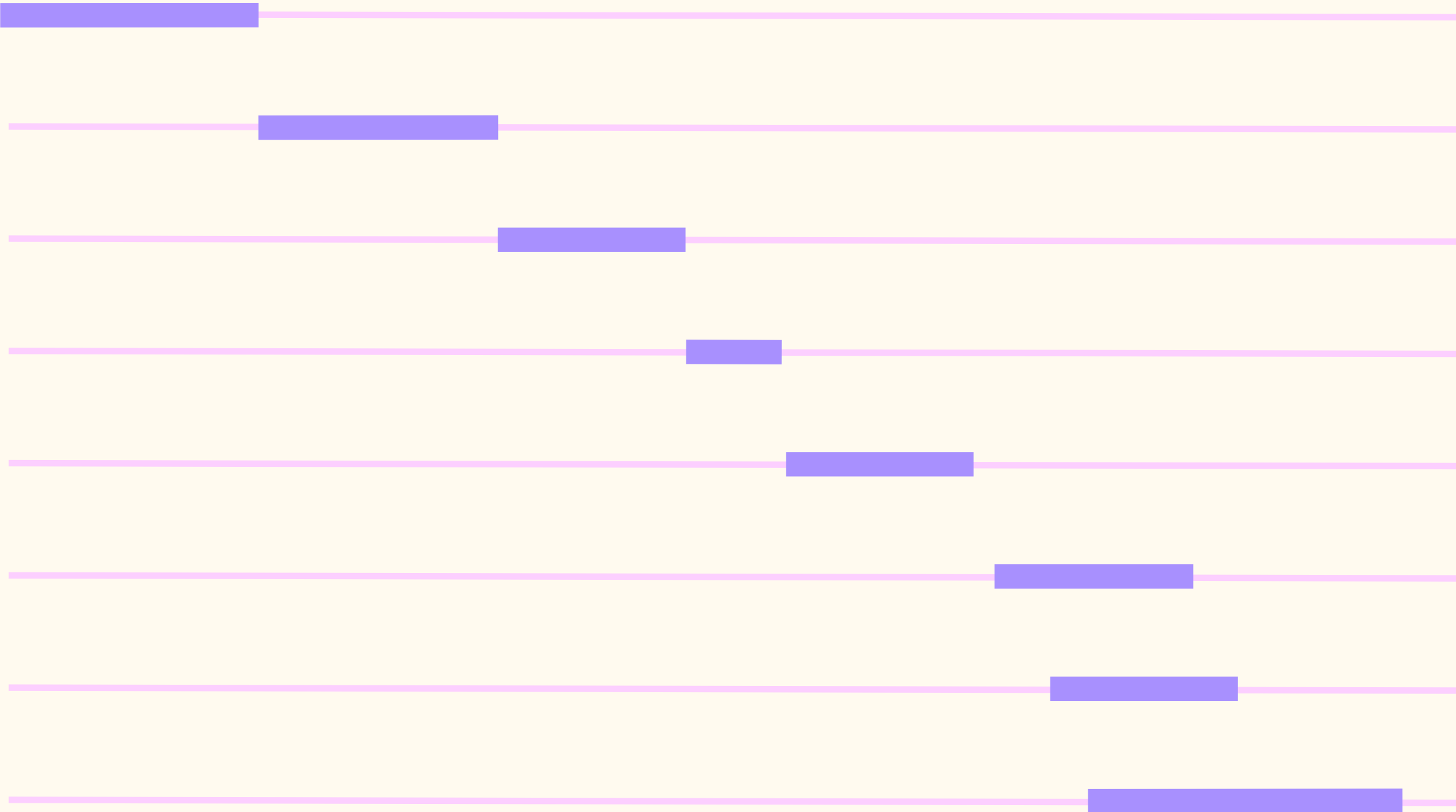
Hardware Design

Circuit Manufacturing

Hardware Manufacturing

Debugging

Project presentation and Final Report Submission



Challenges

- 01** Didn't have much experience working with PIC
- 02** Component Shortage
- 03** Lack of Communication
- 04** Components are Expensive
- 05** Didn't have much experience working with soldering circuits

References

<https://microcontrollerslab.com/mq-2-gas-sensor-interfacing-pic/>

<https://maker.pro/pic/projects/how-to-make-pic-powered-gas-alarm/>

<https://circuitdigest.com/microcontroller-projects/gas-detection-and-ppm-measurement-using-pic-microcontroller-and-mq-gas-sensor>

Project Demonstration





Thank You!

B
for blur

C
for confetti

D
for a drumroll

Any Questions?

0
for bubbles

q
for quiet

x
to close

Any number from 0-9 for a timer