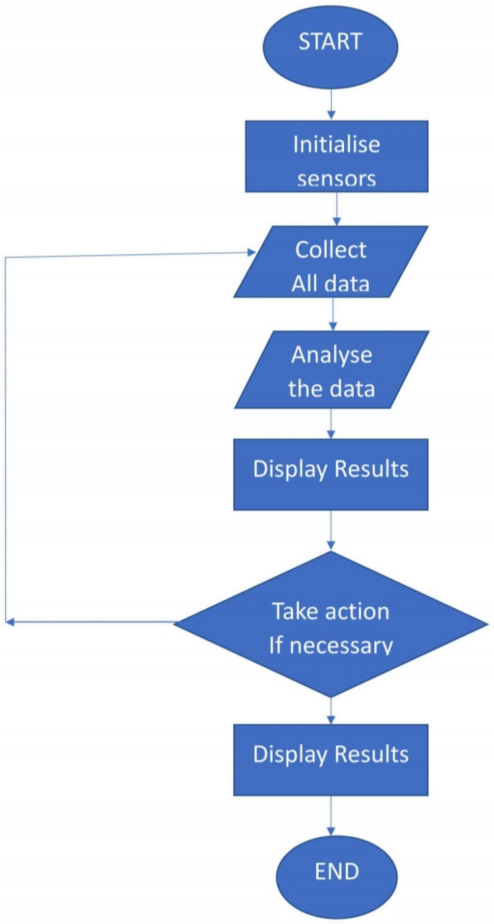
FLOW CHART:


START
Initialise sensors
Collect All data
Analyse the data
Display Results
Take action If necessary
Display Results
END

STEPS FOR FLOWCHART:

STEP 1: Start the program.

STEP 2: Turn on the Gas, Temperature and Humidity sensors.

STEP 3: Collect the data:

i. Read gas concentration.
ii. Measure temperature and humidity level.

STEP 4: Analyze Data:

i. Check if gas concentration is within safe limits.
ii. Check if temperature and humidity is within comfort range.

STEP 4: Display results:

i. Show gas concentration on display.
ii. Show temperature value on display.
iii. Show humidity percentage.

STEP 5: Take action (if necessary):

i. If gas concentration is high, activate alarm or ventilation.
ii. If temperature is too high or low, adjust heating or cooling system.
iii. If humidity is too high or low, activate dehumidifier or humidifier.

STEP 6: Wait for a set time.

STEP 7: Repeat 3-7 continuously.

STEP 8: End the program.

Creating a python script for Air Quality Monitoring:

```
import time
import board
import busio
import adafruit_ccs811

def setup_air_quality_sensor():
    i2c = busio.I2C(board.SCL, board.SDA)
    ccs = adafruit_ccs811.CCS811(i2c)

    if not ccs.data_ready:
        raise RuntimeError("CCS811 not ready to read data, check wiring")
```

```
    return ccs

def main():
    ccs = setup_air_quality_sensor()
try:
        while True:
            if ccs.data_ready:
                temperature = ccs.temperature
                humidity = ccs.humidity
                co2 = ccs.eco2
                tvoc = ccs.tvoc

                print(f"Temperature: {temperature}°C")
                print(f"Humidity: {humidity}%")
                print(f"eCO2: {co2} ppm")
                print(f"TVOC: {tvoc} ppb")

                if co2 > 1000:
                    print("Poor air quality! Increase ventilation.")

                time.sleep(1)
            else:
                time.sleep(0.1)
    except KeyboardInterrupt:
        pass
```

A.Temperature and Humidity sensor

```
if __name__ == "__main__":
    main()
import Adafruit_DHT
import time

# Set the DHT sensor type and GPIO pin
SENSOR_TYPE = Adafruit_DHT.DHT22  # DHT11, DHT22, or AM2302
SENSOR_PIN = 4  # GPIO pin where the sensor is connected

def read_temperature_humidity():
    humidity, temperature = Adafruit_DHT.read_retry(SENSOR_TYPE, SENSOR_PIN)
    return temperature, humidity

def main():
try:
        while True:
```

```
            temperature, humidity = read_temperature_humidity()

            if temperature is not None and humidity is not None:
                print(f"Temperature: {temperature:.2f}°C")
                print(f"Humidity: {humidity:.2f}%")
            else:
                print("Failed to retrieve data. Check the sensor and wiring.")

            time.sleep(2)  # Wait for a few seconds before taking the next reading

    except KeyboardInterrupt:
        print("Monitoring stopped.")
```

B. Gas sensor

```
if __name__ == "__main__":
    main()
import RPi.GPIO as GPIO
import time

# Set GPIO pin for the gas sensor
GAS_SENSOR_PIN = 17  # Change this to your sensor's GPIO pin

def setup_gas_sensor():
    GPIO.setmode(GPIO.BCM)
    GPIO.setup(GAS_SENSOR_PIN, GPIO.IN)

def read_gas_sensor():
    try:
        while True:
            gas_level = GPIO.input(GAS_SENSOR_PIN)
            if gas_level == GPIO.HIGH:
                print("Air quality is good.")
            else:
                print("Warning: Poor air quality detected!")

            time.sleep(2)  # Adjust the interval as needed
    except KeyboardInterrupt:
        GPIO.cleanup()

def main():
    setup_gas_sensor()
    print("Monitoring air quality with the gas sensor.")
    read_gas_sensor()
```

```
if __name__ == "__main__":
    main()
```