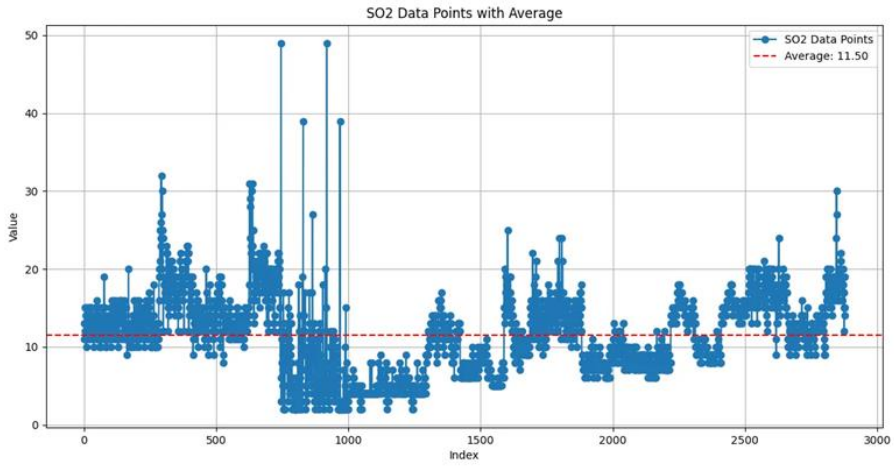
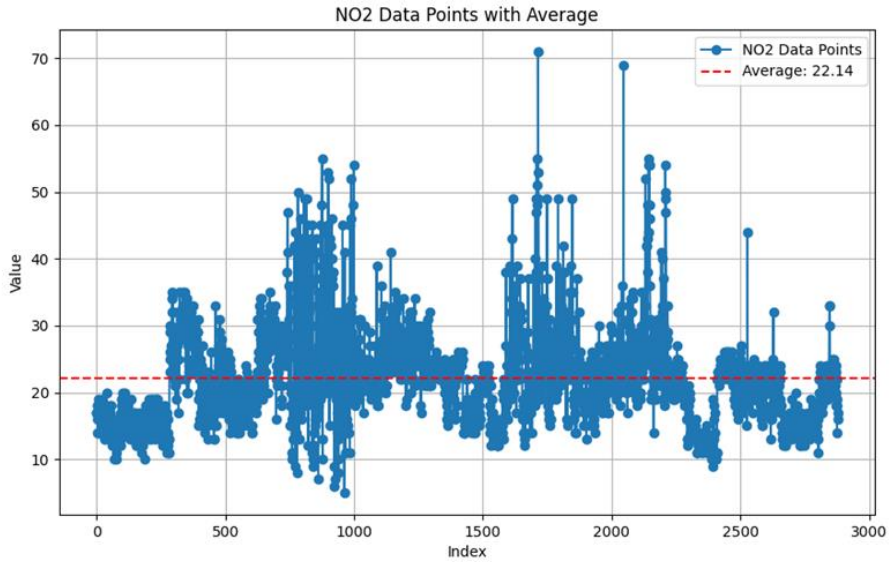
# Phase 4: Development Part 2

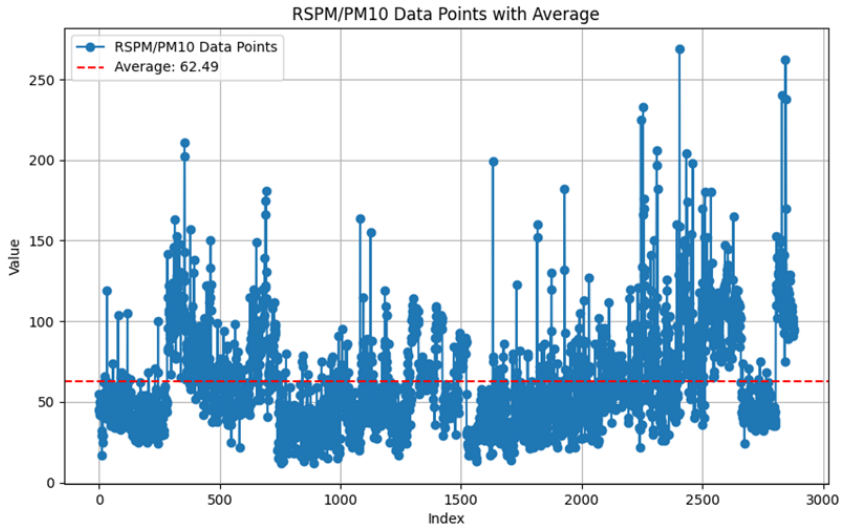
## Program:

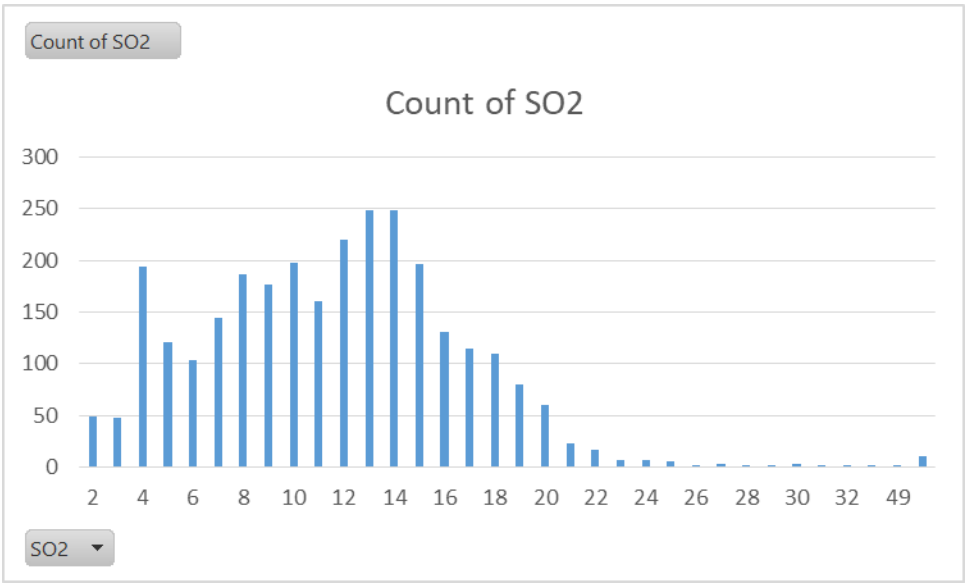
```
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
def calculate_average(data_series):
    return data_series.mean()
def plot_data_with_average(data_series, avg, column_name):
    plt.figure(figsize=(10, 6))
    plt.plot(data_series, 'o-', label=f'{column_name} Data Points')
    plt.axhline(y=avg, color='r', linestyle='--', label=f'Average: {avg:.2f}')
    plt.title(f"{column_name} Data Points with Average")
    plt.xlabel("Index")
    plt.ylabel("Value")
    plt.legend()
    plt.grid(True)
    plt.show()
data_points = pd.read_csv("D:/cpcb_dly_aq_tamil_nadu-2014.csv")
columns_to_plot = ['SO2', 'NO2', 'RSPM/PM10']
for col in columns_to_plot:
    avg = calculate_average(data_points[col])
    plot_data_with_average(data_points[col], avg, col)
```

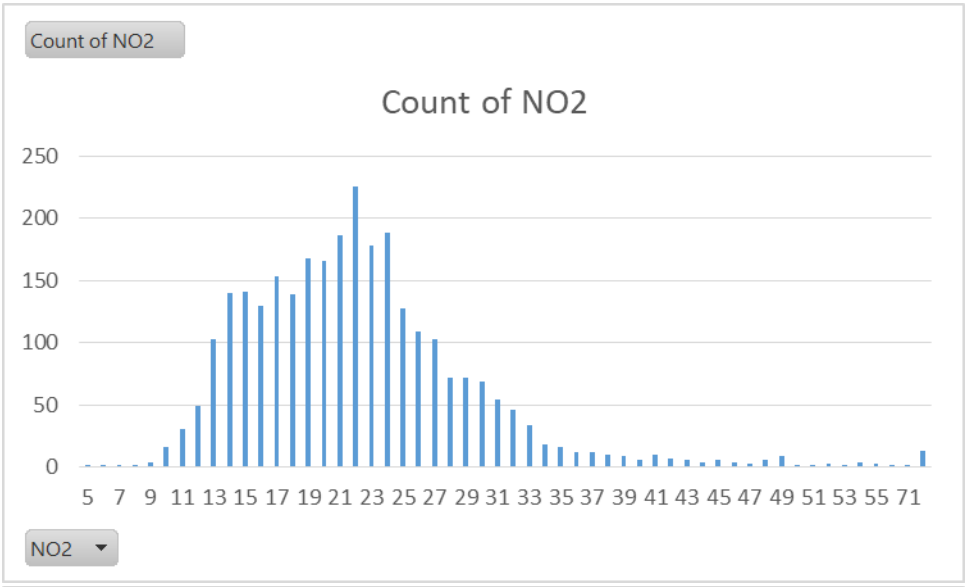
## Output:

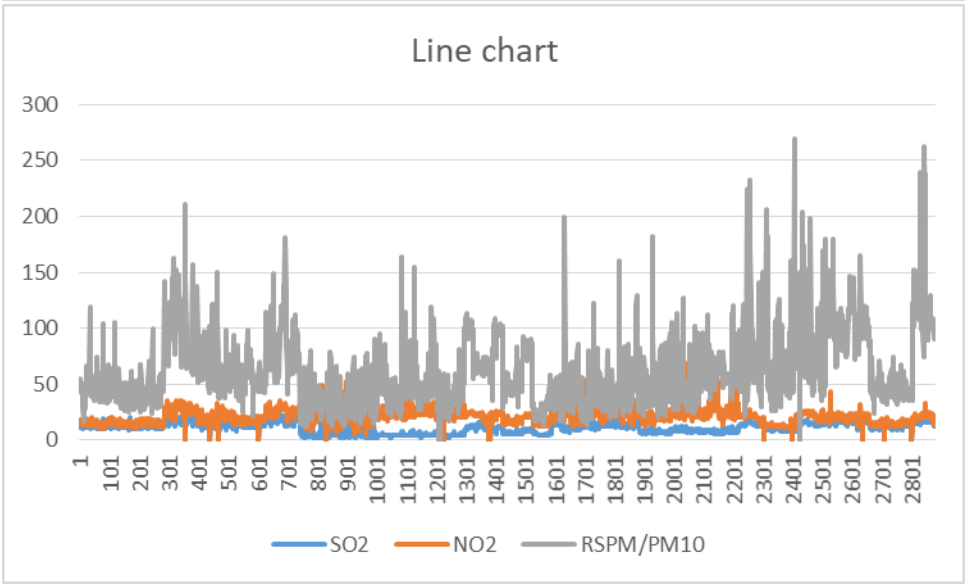

SO2 Data Points with Average
SO2 Data Points
Average: 11.50
Value
Index
0
10
20
30
40
50
0
500
1000
1500
2000
2500
3000


NO2 Data Points with Average
NO2 Data Points
Average: 22.14
Value
Index
10
20
30
40
50
60
70
0
500
1000
1500
2000
2500
3000


RSPM/PM10 Data Points with Average
RSPM/PM10 Data Points
Average: 62.49
Value
Index
0
50
100
150
200
250
0
500
1000
1500
2000
2500
3000


Count of SO2
Count of SO2
300
250
200
150
100
50
0
2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 49
SO2


Count of NO2
Count of NO2
250
200
150
100
50
0
5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37 39 41 43 45 47 49 51 53 55 71
NO2


Line chart
300
250
200
150
100
50
0
1 101 201 301 401 501 601 701 801 901 1001 1101 1201 1301 1401 1501 1601 1701 1801 1901 2001 2101 2201 2301 2401 2501 2601 2701 2801
SO2
NO2
RSPM/PM10