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Air Quality Data Analysis – Tracking Pollution Levels and Their Impact on Health

A PROJECT REPORT

Submitted by

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in partial fulfilment for the award of the degree of

BACHELOR IN COMPUTER APPLICATIONS

CHANDIGARH UNIVERSITY
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ABSTRACT

Air pollution remains one of the most pressing environmental challenges of modern times. With growing industrialization, increased vehicular emissions, and urban expansion, the air quality in many Indian cities has deteriorated significantly. Chandigarh, despite being a planned and green city, has also witnessed a surge in air pollution levels, particularly with rising concentrations of particulate matter such as PM2.5 and PM10. These pollutants are known to penetrate deep into the lungs and bloodstream, causing a wide range of health issues including asthma, bronchitis, cardiovascular diseases, and more.

This project focuses on tracking and analyzing air pollution levels in Chandigarh during the month of April 2025. The primary aim is to observe the variations in PM2.5, PM10, and AQI values, and to assess how these fluctuations might affect the health of the population. By collecting real-time data and utilizing Microsoft Excel, the data was structured into meaningful visual formats, making it easier to draw insights and recognize trends.
Through this analysis, we aim not only to understand the daily patterns of pollution but also to highlight the importance of data-driven environmental monitoring. The project emphasizes the need for immediate action, increased awareness, and stringent policies to control pollution and safeguard public health.

INTRODUCTION

Air pollution is one of the most significant environmental concerns in today's world, especially in urban regions like Chandigarh where population density, traffic, and industrial activities contribute to deteriorating air quality. Exposure to air pollutants like particulate matter (PM2.5 and PM10) can result in severe health issues including respiratory diseases, cardiovascular problems, and even reduced life expectancy.

This project explores how the air quality in Chandigarh fluctuates throughout April 2025. By analyzing the levels of PM2.5, PM10, and AQI, and visualizing the patterns using Excel charts, the project enables better understanding of pollution trends and their implications on public health.

DATA OVERVIEW

- Location: Chandigarh
- Duration: 1st April to 30th April 2025
- Pollutants Monitored: PM2.5 (ug/m3), PM10 (ug/m3), AQI

Data was collected from reputed online sources like IQAir, OpenAQ, and the Central Pollution Control Board. The raw data was then organized into an Excel sheet with each row representing daily pollutant levels. The pollutants were chosen because they are widely recognized as key indicators of air quality and have a direct impact on human health.

OBJECTIVES

- To monitor and record the daily AQI, PM2.5, and PM10 levels in Chandigarh during April 2025.
- To analyze the trends and identify peak pollution days.
- To assess the health impacts of air pollution based on the observed levels.
- To visually represent the pollution levels using graphs and charts for easy understanding.

TOOLS USED

- **Microsoft Excel 365** for data recording, calculation, chart creation, and formatting.
- **Online Air Quality APIs** for gathering daily pollution data.

STEPS TO ANALYZE THE DATA

1. **Data Collection**:
    - Sourced daily values of PM2.5, PM10, and AQI.

2. **Data Entry in Excel**:
    - Input data in rows with columns: Date, PM2.5, PM10, AQI.

3. **Calculation of Averages**:
    - Used AVERAGE functions to compute mean values.

4. **Chart Creation**:
    - Line graphs were used to track AQI, PM2.5, and PM10 trends.

5. **Conditional Formatting**:
    - Highlighted days with AQI > 120 as red (unhealthy).

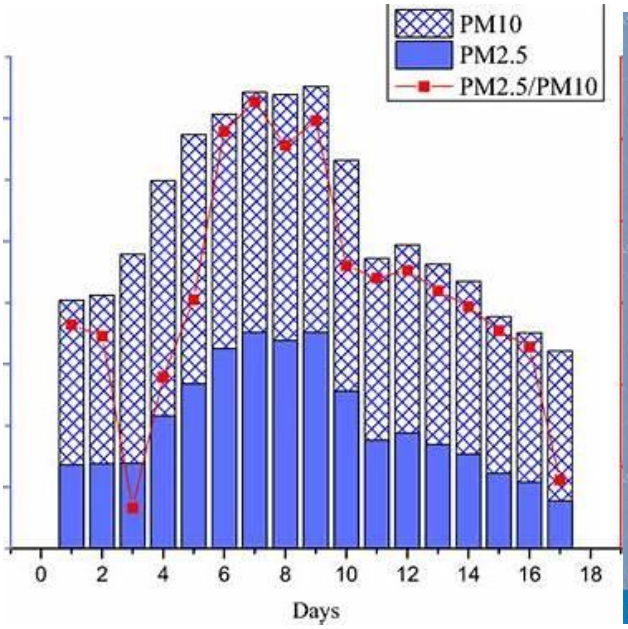
6. **Trend Analysis**:
    - Analyzed spikes, dips, and weekly averages.

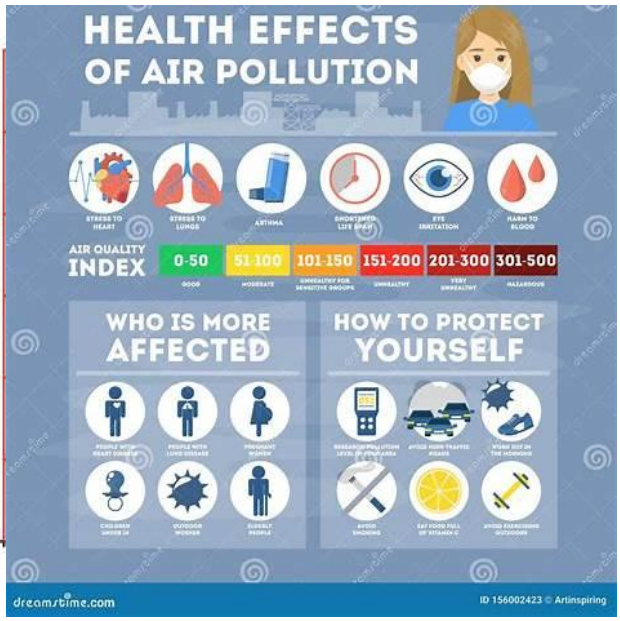
7. **Insights Derived**:
    - Identified peak pollution days and compared against safe thresholds.

OUTPUT SCREENSHOTS

- **AQI Trend Chart:** Daily AQI levels with highlighted peaks.

- **Pollutant Concentration Chart:** Visual comparison of PM2.5 and PM10 over 30 days.





AQI AT MONITORING STATIONS

	SEC 53	SEC 25	SEC 22	DAY	SEC 53	SEC 25	SE
1	164	96	296	NOV 6	246	118	21
2	198	113	190	NOV 7	209	108	28
3	285	122	208	NOV 8	293	171	24
4	197	101	136	NOV 9	452	337	41
5	212	106	185	NOV 10	345	310	31

CONCENTRATION OF POLLUTANTS ON NOV 9

METER	%AGE RISE*	PARAMETER	%AG
2.5	60.35	Nitrogen oxide	3
.0	51.15	Sulphur dioxide	2
on monoxide	36.02	Nitrogen oxides	2
nonia	31.66	Nitrogen dioxide	2

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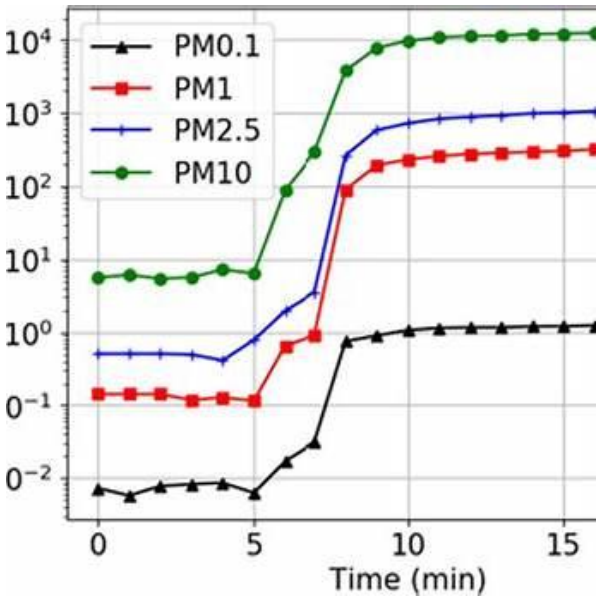

CONCLUSION

This analysis shows that Chandigarh experienced moderate to high pollution levels in April 2025. The PM2.5 and PM10 levels often crossed the safe threshold, especially on days with AQI over 130. These elevated levels pose risks to people with respiratory conditions, children, and the elderly. Excel served as an effective tool to visualize and interpret air quality trends. The findings reinforce the importance of pollution control measures and public health awareness.

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