AQI stands for Air Quality Index, which is a numerical scale used to report how polluted the air is in a particular location. The AQI takes into account several pollutants that are commonly found in the air, such as particulate matter, ozone, sulfur dioxide, nitrogen dioxide, and carbon monoxide.

The AQI scale ranges from 0 to 500, with higher numbers indicating more polluted air. The AQI is typically reported in real-time by government agencies and other organizations that monitor air quality.

An AQI reading of 0 to 50 is considered good air quality, while an AQI reading of 51 to 100 is considered moderate air quality. An AQI reading of 101 to 150 is considered unhealthy for sensitive groups, such as people with respiratory problems. An AQI reading of 151 to 200 is considered unhealthy for everyone, and AQI readings above 200 are considered very unhealthy and can be dangerous to people's health.

The AQI is a useful tool for people to determine the quality of the air they are breathing and take appropriate precautions to protect their health.

As we continue to face the global challenge of air pollution, it is essential to understand how different regions and states are affected by this issue. The Air Quality Index (AQI) is a valuable tool that allows us to compare and evaluate the air quality of various locations. In this research paper, we will be exploring and comparing the AQI of different states in India, providing valuable insights into the impact of air pollution on the Indian population. By examining the AQI levels of different states in India in 2021, we can gain a better understanding of the severity of the problem and identify potential solutions to mitigate this issue.

INTRODUCTION

Air pollution has become a significant public health concern in India, with cities facing severe levels of pollution year-round. The deterioration of air quality has led to adverse effects on human health and the environment. In recent years, machine learning techniques have shown promise in predicting air quality levels, enabling timely interventions and effective policies. In this research paper, we present a novel approach for predicting air quality levels in Indian cities using machine learning and Long Short-Term Memory (LSTM) models. Our study focuses on the air quality data of 2021, which is critical in understanding the impact of the pandemic on air quality. Our findings can inform policymakers and stakeholders to implement targeted interventions to improve air quality and protect public health.

In recent years, air pollution has become a major public health concern in India, with several cities consistently ranking among the most polluted in the world. The situation has only worsened with the COVID-19 pandemic, as the lockdowns and reduced economic activity have led to a false sense of improvement in air quality. With the resumption of normalcy, the need to monitor and predict air quality has become more critical than ever.

This research paper proposes a machine learning and LSTM-based approach for predicting air quality in Indian cities using data from the year 2021. The use of machine learning algorithms and LSTM models has shown promising results in accurately predicting air quality in various parts of the world.

The proposed model uses data from various sources, including meteorological data, air quality index readings, and satellite imagery. The data is preprocessed and transformed using various techniques such as scaling, normalization, and feature selection. The processed data is then fed into the LSTM model, which is capable of capturing temporal dependencies in the data, and predicting air quality values for the next hour, day, or week.

The study focuses on 10 major Indian cities, including Delhi, Mumbai, Bangalore, Kolkata, Chennai, Hyderabad, Pune, Ahmedabad, Jaipur, and Lucknow. These cities were selected based on their high levels of pollution and population density. The proposed model is trained on data from the year 2021, which includes hourly readings of various pollutants such as PM2.5, PM10, NO2, SO2, and O3.

The paper also evaluates the performance of the proposed model by comparing its predictions with actual air quality index readings from the Central Pollution Control Board (CPCB). The evaluation metrics include mean absolute error, root mean square error, and correlation coefficient. The results show that the proposed model outperforms existing models in predicting air quality in Indian cities.

The findings of this research have significant implications for policymakers and urban planners in India. Accurate air quality prediction can help in implementing targeted interventions to reduce pollution levels, such as traffic restrictions, emissions controls, and public awareness campaigns. The proposed model can also be used to develop early warning systems to alert people about hazardous air quality conditions.

Overall, this research presents a novel approach to air quality prediction in Indian cities using machine learning and LSTM models, which can help in addressing the critical issue of air pollution and its impact on public health.