PROBLEM STATEMENT:

The air quality is growing concern due to its potential health, environmental and economic impacts. Poor air quality characterized by high level of pollutants such as nitrogen oxide, sulphur dioxide etc. This problem is to analyze the air quality in Tamil nandu.

OBJECTIVE:

The objective is to gain insights into air pollution trends, identify areas with high pollution levels, and develop a predictive model to estimate RSPM/PM10 levels based on SO2 and NO2 levels. This project involves defining objectives, designing the analysis approach, selecting visualization techniques, and creating a predictive model using Python and relevant libraries.

AIR POLLUTION TRENDS:

some trends and factors related to air pollution in Tamil Nadu:

1. Industrial Emissions: Tamil Nadu is an industrialized state with a significant number of industries, including manufacturing, chemicals, and textiles. Industrial emissions have been a major contributor to air pollution in the region.

2. Vehicle Emissions: The increasing number of vehicles on the road, particularly in cities like Chennai, has led to higher levels of air pollution. Diesel and gasoline vehicles are significant sources of pollutants like nitrogen oxides (NOx) and particulate matter (PM).

3. Urbanization: Rapid urbanization and construction activities in Tamil Nadu have contributed to dust and particulate matter in the air.

4. Agricultural Practices: Agricultural activities, including crop residue burning, can also contribute to localized air pollution.

5. Seasonal Variations: Air pollution levels in Tamil Nadu can vary seasonally. For example, the post-monsoon period might see an increase in air pollution due to factors like crop burning.

6. Government Initiatives: The Tamil Nadu Pollution Control Board (TNPCB) and other relevant authorities have been working on air quality monitoring and implementing measures to reduce pollution. Initiatives may include the promotion of cleaner fuels, public transportation, and stricter industrial emission standards.

AREAS WITH HIGH POLLUTION:

Kathivakkam, Thiruvettrivur, T.Nagar, anna Nagar, adaiyar, kilpauk, madras medical college are the areas with high pollution

PREDICTIVE MODEL:

RELEVANT LIBIRARIES:

1.TensorFlow: This library was developed by Google in collaboration with the Brain Team. It is an open-source library used for high-level computations. It is also used in machine learning and deep learning algorithms. It contains a large number of tensor operations. Researchers also use this Python library to solve complex computations in Mathematics and Physics.

2.Matplotlib: This library is responsible for plotting numerical data. And that’s why it is used in data analysis. It is also an open-source library and plots high-defined figures like pie charts, histograms, scatterplots, graphs, etc.

3.Pandas: Pandas are an important library for data scientists. It is an open-source machine learning library that provides flexible high-level data structures and a variety of analysis tools. It eases data analysis, data manipulation, and cleaning of data. Pandas support operations like Sorting, Re-indexing, Iteration, Concatenation, Conversion of data, Visualizations, Aggregations, etc.

4.Numpy: The name “Numpy” stands for “Numerical Python”. It is the commonly used library. It is a popular machine learning library that supports large matrices and multi-dimensional data. It consists of in-built mathematical functions for easy computations. Even libraries like TensorFlow use Numpy internally to perform several operations on tensors. Array Interface is one of the key features of this library.

5.SciPy: The name “SciPy” stands for “Scientific Python”. It is an open-source library used for high-level scientific computations. This library is built over an extension of Numpy. It works with Numpy to handle complex computations. While Numpy allows sorting and indexing of array data, the numerical data code is stored in SciPy. It is also widely used by application developers and engineers.

Visualization selection:

