AIR QUALITY ASSESSMENT-TAMILNADU

TEAM MEMBER

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Phase-2 (INNOVATION).

Machine Learning (Algorithms).

Air quality Assessment:

The project aims to analyze and visualize air quality data from monitoring stations in Tamil Nadu. 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 visualized techniques, and creating a Predictive model using Python and relevant libraries. Air Quality Analysis Objectives.

Algorithm:

1. **Data Collection:**

    Gather air quality data from various sources like sensors, weather stations, or government agencies. This data typically includes parameters like PM2.5, PM10, NO2, CO, etc.

2. **Data Preprocessing:**

    Clean and prepare the data for analysis. This involves tasks like handling missing values, outlier detection, and normalization.

3. **Feature Engineering:**

Extract relevant features from the data. These could be time of day, weather conditions, geographical coordinates, etc., that may impact air quality.

4. **Exploratory Data Analysis (EDA):**

   Analyze and visualize the data to gain insights. This can help you understand the relationships between different variables.

5. **Model Selection:**

   Choose a machine learning algorithm suitable for your task. For air quality assessment, regression models like Linear Regression, Decision Trees, Random Forest, or more advanced models like Neural Networks could be considered.

6. **Model Training:**

   Split the data into training and testing sets. Train the model on the training data and validate it on the testing data to ensure it generalizes well.

7. **Model Evaluation:**

   Use appropriate metrics (e.g., Mean Absolute Error, Root Mean Squared Error) to evaluate the performance of your model.

8. **Model Tuning:**

   Adjust hyperparameters or try different algorithms to improve performance.

9. **Deployment:**
   Once satisfied with the model's performance, deploy it in a suitable environment. This could be an app, a web service, or an integrated system.

   10. **Monitoring and Maintenance:**

   Continuously monitor the model's performance and update it as needed. Air quality conditions can change over time.