

■ AI-Based Air Quality Index (AQI) Prediction Using Machine Learning

■ Overview:

Air pollution poses one of the greatest environmental health risks globally. This project leverages the power of Artificial Intelligence (AI) and Machine Learning (ML) to predict the **Air Quality Index (AQI)** across major Indian cities. By analyzing historical air pollution and weather data, the model forecasts AQI levels to support early warnings, policy-making, and sustainable development initiatives.

■ Objective:

To design and train a predictive model capable of estimating AQI values using pollutant data (PM2.5, PM10, NO2, CO, SO2, etc.) and meteorological parameters. The model aims to empower environmental monitoring agencies and citizens to make data-driven decisions for cleaner cities.

■ Scope & Impact:

This project contributes to **UN Sustainable Development Goals (SDG 11 & SDG 13)** by promoting sustainable urban development and climate action. The predictive insights generated will help governments, NGOs, and researchers understand pollution patterns, enforce environmental policies, and create healthier living environments.

■ Project Highlights:

Feature	Description
Dataset	Air Quality Data in India (Kaggle – Rohan Rao)
Approach	Machine Learning and Deep Learning (Keras Sequential Model)
Algorithms Used	Linear Regression, Random Forest, XGBoost, Neural Network
Tools & Libraries	Python, Pandas, NumPy, Scikit-learn, TensorFlow, Matplotlib, Seaborn
Platform	Google Colab / Jupyter Notebook

■ Expected Outcomes:

- A trained AI model capable of predicting AQI levels accurately.
- Visualizations showing key pollution trends across cities.
- Insights for policymakers and citizens to take proactive environmental measures.
- Potential integration into real-time dashboards or mobile apps for continuous monitoring.

■ Conclusion:

The AI-based AQI Prediction Model demonstrates how data-driven intelligence can promote sustainability and urban resilience. By harnessing open data and machine

learning, this project takes a significant step toward cleaner, smarter, and more sustainable cities.

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Topic: AI for Sustainable Development Goals (SDG)