



ECOTECH HACKATHON-Hacks for Sustainable Tomorrow

Prepared by

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Why This Project

We have initiated this project in response to the critical environmental challenges our world is facing today. The overarching problem we are striving to address is the need for effective and data-driven environmental conservation. We recognize that our environment is under constant threat from factors like air pollution, water contamination deforestation, and shifting climate patterns. These issues have far-reaching consequences on human health, ecosystems, and our planet.

- Urgency: The urgency of environmental issues cannot be overstated. Climate change and environmental degradation are accelerating, and timely action is imperative to mitigate their effects.
- Data-Driven Approach: We believe in the power of data to drive informed decisions. Our project leverages advanced AI and machine learning techniques to process and analyze diverse environmental data. This data-driven approach enables us to gain comprehensive insights into the state of our environment.



Approach



1. Data Sources and Collection

The environmental data for our project has been sourced from the Kaggle website, a reputable platform for datasets and data-driven projects. We focused on gathering data related to water and air quality to address the environmental facets targeted in our project.

- **Water Quality Data:**

Parameters Included: For water quality analysis, we included the following essential parameters:

- pH (acidity or alkalinity level)
- Hardness (mineral content)
- Value of solid particles
- Chloramines concentration
- Value of sulfates
- Conductivity (electrical conductivity)
- Organic carbon content
- Trihalomethanes concentration
- Value of turbidity (cloudiness or haziness)



- Air Quality Data:

Parameters Included: In the case of air quality, we focused on a critical parameter:

- Amount of Particulate Matter (PM)
- So₂
- Co₂
- O₂

- Data Preprocessing Steps:

- Data Filtering: We removed records with missing values (null values) and addressed outliers in the data to ensure completeness and reliability for analysis.
- Memory Optimization: We optimized memory usage by selecting appropriate data types for columns and reducing redundancy in the dataset.

2. UI AND UX DEVELOPMENT

We have developed a CRUD application with HTML and CSS for the frontend and Flask for the backend. Its primary purpose is to collect input on air quality, water quality, deforestation rates, and climatic conditions. Based on these parameters, the application assesses whether the environmental conditions are suitable or not, offering a user-friendly way to evaluate environmental suitability.

3. Technical Implementations

- Programming Languages Used: HTML,CSS ,Python
- Libraries: SkLearn, Pandas, Numpy , Seaborn
- Frameworks: Flask
- ML Models: Random Forest





▶ Benefits

1. Data-Driven Decision-Making: Empowers users with data-driven insights for informed actions.
2. Customized Recommendations: Tailors sustainable behavior suggestions to individual contexts.
3. Scalability and Accessibility: Modular design accommodates growth and user diversity.

▶ Team Contribution

1. Vaidik Pandey – Data Analysis and Training and testing ML Models.
2. Shreyansh Srivastava – UI/UX Development
3. D Satya Harshit – Deployment of ML model using Flask, Documentation.

▶ References

<https://www.kaggle.com/>

▶ Remaining Part of The Project

→ Model Deployment



Thank you

