Hack-AI-Thon

AI CoLegion

ERROR BANDITS

Team Leader: Sachin Kumawat

Siddhant M. Rajwardhan P. Karmanya J.

Selected Problem: AeroGuard-Hyper-Local Air Quality & Health Risk Forecaster

BRIEF:

- ***The absence of an intelligent, hyper-local system that predicts air quality in the near future.***
- ***Lack of tools that translate AQI forecasts into health-relevant insights.***
- ***No integrated solution that adapts guidance based on user demographics and exposure patterns.***

Existing Solutions & Research

- IQair
- Plume labs
- Breezometer
- SAFAR

These do not have personalisation, reasoning for pollution, user daily plan suggestions, forecast of future Aqi

HOW AEROGUARD: HELPS:

Turning Data Into Action

The system forecasts air quality at a hyper-local level, revealing pollution variations that city-wide averages fail to capture.

Awareness Before Damage

It translates raw air quality data into personalized, easy-to-understand health risk insights for different user groups such as children, elderly individuals, and outdoor workers.

Predict. Explain. Protect.

By providing clear explanations, early warnings, and actionable recommendations, the system empowers people to make informed decisions — helping reduce health risks, prevent misinformation, and protect lives.

LIST OF FEATURES

How is AeroGuard different?

Turns confusing air-quality data into simple, actionable steps you can actually follow. Also is easy-to-use by people of all ages

Why AeroGuard matters?

Protects health, saves time, and keeps you one step ahead of pollution with clear, personalized guidance.

How does AeroGuard solve the issue?

Tracks pollution across the city and gives you a heads-up before it becomes a problem.

What makes AeroGuard unique?

Brings the city’s air to life with real-time, hyper-local insights that help you make smarter choices every day.

WHAT MAKES AEROGUARD UNIQUE:

AQI Predictor

The system analyzes recent air quality data from the past few hours and predicts AQI levels for the next 6–12 hours
This helps users know in advance if air quality is going to worsen or improve real-time monitoring.

Personalized Auto Scheduler

The system studies daily and weekly AQI patterns for the user's location and identifies peak pollution hours in the week.
Based on this, it suggests safer time slots for activities like workouts or outdoor work.
This helps users plan their day around safer conditions.

Air Alert

Air Alert keeps you one step ahead of dangerous air, sending real-time warnings for your area and giving simple, actionable advice to stay safe when pollution spikes. make it more humanised

Hyper-local Spacial Intelligence

The system achieves high-resolution, street-level air quality localization by combining Google Maps for spatial mapping with data from localized sensors, allowing it to detect small-scale pollution patterns within urban environments.

TECHNOLOGIES USED

Platforms

- StreamLit
- VSCode
- GitHub

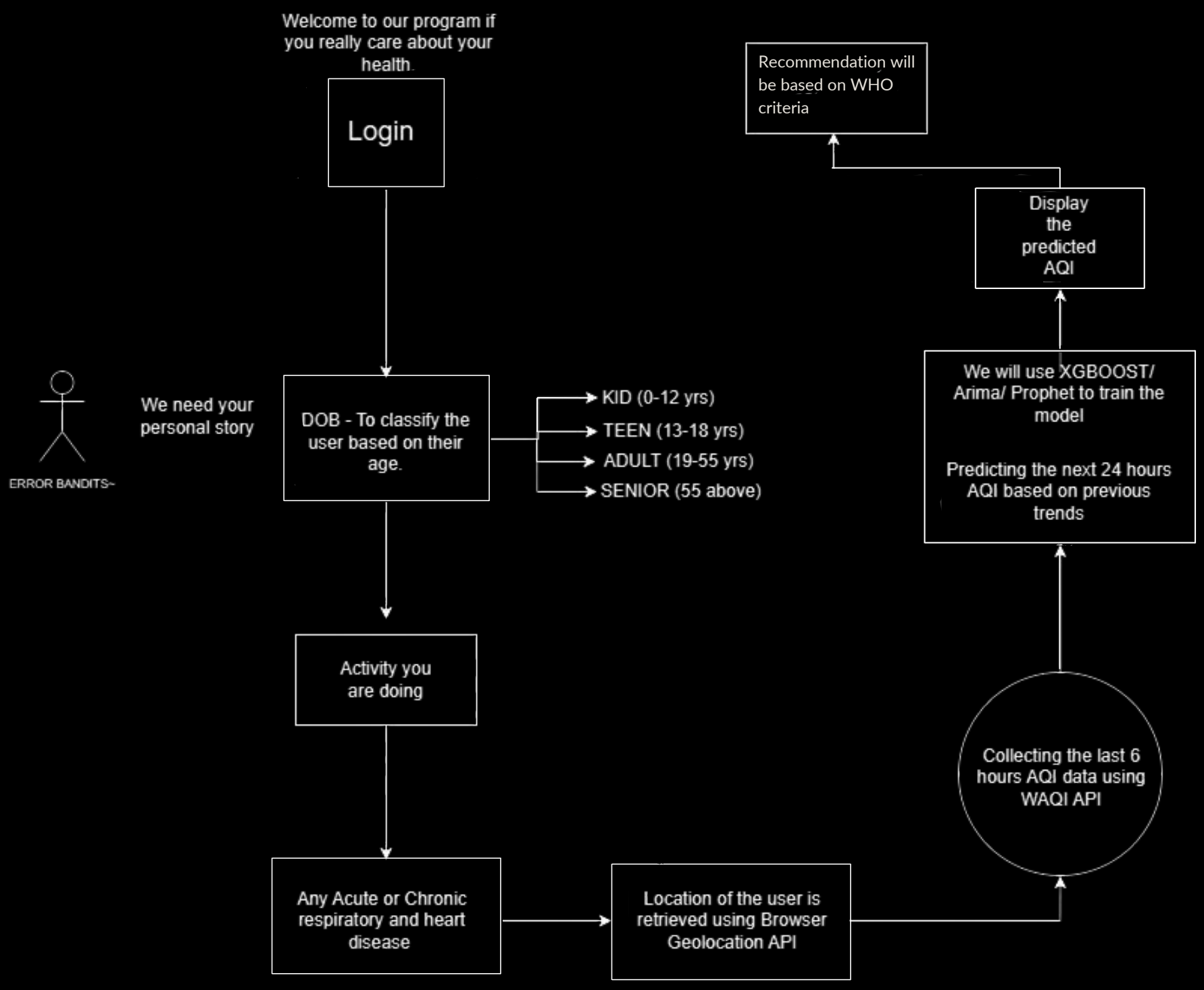
Languages

- Python
- CSS

APIs

- OpenWeather
- Browser Geolocation
- Calender API
- Arima/Xgboost/Prophet
- Gemini API
- GoogleOAUTH

SOLUTION APPROACH



ADDITIONAL DETAILS / FUTURE DEVELOPMENTS

Chatbot

The chatbot will help in all sectors related to Aeroguard and how to use it. If more particular help is required it will connect to more specialised individuals

Chat with specialist

It will allow users to connect to individuals specialised in medical assistance and meterology

City Pulse

City Pulse lets you plan your journey with clean air in mind, highlighting polluted zones along your route and suggesting the safest paths so you can travel without worrying about harmful exposure.

POTENTIAL IMPACT

In the future, AeroGuard could evolve into a city-scale early warning layer for air pollution, enabling communities to anticipate and reduce exposure before health effects occur. By integrating with urban planning, transportation systems, and public advisories, it could support smarter infrastructure decisions and pollution-aware mobility. At scale, AeroGuard has the potential to shift how cities respond to air quality—from passive monitoring to proactive, preventive environmental health management.