PROJECT REPORT CITY AQI CHECKER USING PYTHON AND TKINTER

1. INTRODUCTION This project is a simple desktop-based Air Quality Index (AQI) checking application. It allows the user to select a city from a predefined list and fetches real-time AQI data using the Open-Meteo Air Quality API. The application displays the US AQI, PM2.5, and PM10 levels of the selected city.

2. OBJECTIVE The main objective of this project is to create a user-friendly interface that helps users quickly check the air pollution level of major Indian cities using Python.

3. TECHNOLOGIES USED - Python - Tkinter (GUI) - Requests library (API calls) - Open-Meteo Air Quality API

4. FEATURES - Dropdown menu for city selection - Fetches real-time AQI values - Displays AQI, PM2.5, and PM10 - Simple and clean GUI - Error handling for failed API requests

5. SYSTEM REQUIREMENTS Software Requirements: - Python 3.x - Required Libraries: tkinter, requests

Hardware Requirements: - Any basic computer system capable of running Python

6. WORKING OF THE APPLICATION Step 1: User selects a city from the dropdown. Step 2: Application retrieves latitude and longitude from a predefined dictionary. Step 3: A request is made to the Open-Meteo API. Step 4: The data is received and extracted. Step 5: The AQI values are displayed in the GUI window.

7. CODE STRUCTURE - CITY_COORDS dictionary stores major city coordinates. - get_aqi() function fetches AQI data using API. - show_aqi() updates GUI with AQI results. - Tkinter is used to build the interface.

8. ADVANTAGES - Real-time AQI monitoring - Portable and lightweight - Easy for beginners to understand - Reliable API results

9. LIMITATIONS - Works only for predefined cities - Requires internet for API calls - Limited air quality parameters

10. FUTURE ENHANCEMENTS - Add more cities dynamically - Display AQI color indicators - Add graphs for pollution levels - Create an Android or Web-based version

11. CONCLUSION This project is a beginner-friendly Python application demonstrating GUI programming, API usage, and environmental awareness. It can be extended into a more detailed AQI analysis tool.

END OF REPORT