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Weather-Based Music Recommendation

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ABSTRACT: Weather-Based Music Recommendation is a web application designed to recommend music playlists based on real-time weather data. By integrating the Spotify API and Open Weather API, the application tailors music genres to the user's local weather conditions, offering a personalized experience. The system employs HTML, CSS, and vanilla JavaScript to create a dynamic and responsive user interface, enhancing accessibility and user engagement. This paper discusses the implementation, challenges, and future scope of Weather-Based Music Recommendation demonstrating its potential as a weather-aware music recommendation system.

KEYWORDS: Weather-based recommendations, SpotifyAPI, Open Weather API, music recommendation, web application, JavaScript.

I. INTRODUCTION

The interplay between weather and human emotions is well-documented. Music, similarly, influences mood and behavior. Weather-Based Music Recommendation leverages these connections, creating a web-based system that aligns music recommendations with current weather conditions. The application is designed to provide an intuitive and seamless experience by combining real-time weather data with Spotify's curated playlists.

This paper presents the system's design, implementation, and evaluation, focusing on the practical application of web development technologies and API integration in real-world scenarios.

II. RELATED WORK

A. Existing System

Currently, music recommendation systems like Spotify and Apple Music provide personalized playlists based on user preferences, listening history, and trending tracks. These systems lack integration with real-time external factors such as weather conditions. While some platforms allow users to choose mood-based playlists, they rely solely on manual input and do not dynamically adapt to the user's environment, such as weather changes. This limits the personalization experience and fails to incorporate weather as a factor influencing the user's music preferences.

B. Proposed System

The proposed system bridges the gap by offering an app that dynamically recommends music playlists based on the current weather conditions. Using the OpenWeather API, the app fetches real-time weather data and maps it to predefined music genres (e.g., rainy = acoustic, sunny = upbeat pop). These genres are then used to fetch suitable playlists from the Spotify API. By automating playlist generation based on the weather, the system provides a unique, contextual, and personalized music experience. Additional features such as weather visualization with icons or emojis and error-handling mechanisms ensure a smooth user experience.



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III. METHODOLOGY

1. **System Design:** Weather-Based Music Recommendation architecture includes three core components:
 1. **Frontend Interface:** Built with HTML, CSS, and JavaScript, ensuring a responsive and user-friendly design.
 2. **Weather Data Integration:** OpenWeather API provides real-time weather data, enabling dynamic updates based on user location.
 3. **Music Recommendation Engine:** Spotify API fetches playlists aligned with weather-mapped genres (e.g., upbeat for sunny, mellow for rainy).
2. **Implementation:**
 - **APIs Used:**
 - Open Weather API for weather data.
 - Spotify API for generating playlists.
 - **Programming Paradigm:**
 - Asynchronous programming using Promises and Async/Await for efficient API handling.
 - **Responsive Design:**
 - CSS media queries for adaptability across devices.
3. **Challenges:**
 - API rate limits were mitigated with retry mechanisms and error handling.
 - Cross-Origin Resource Sharing (CORS) issues were addressed using secure API tokens.

IV. EXPERIMENTAL RESULTS

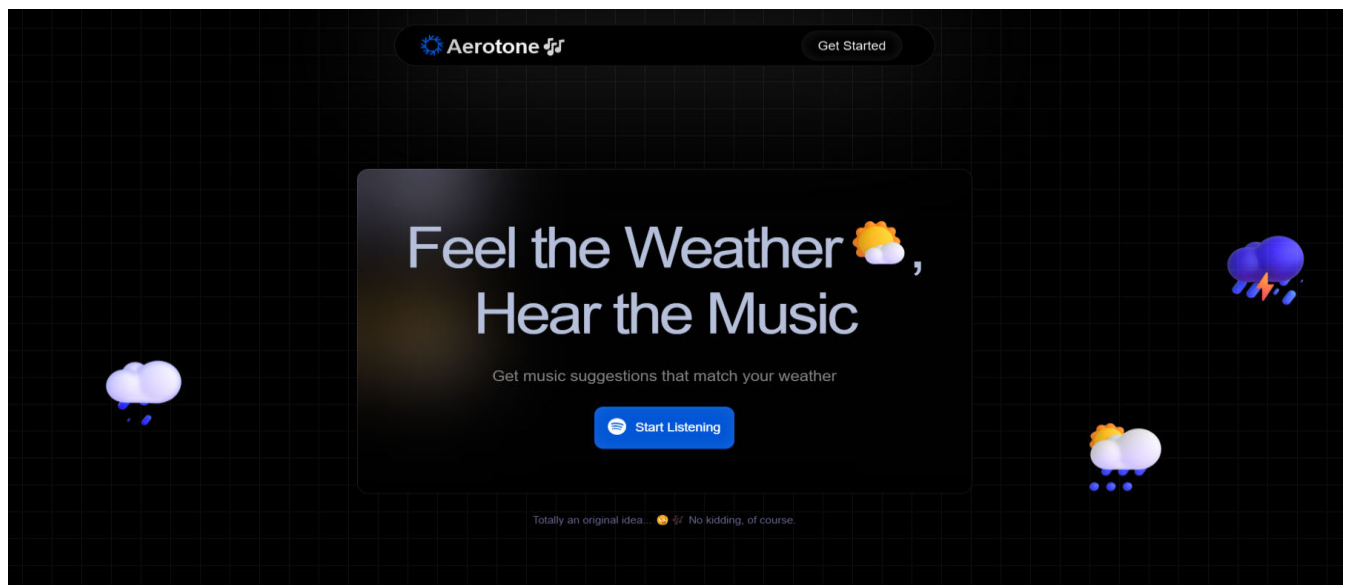


Fig1: Start page



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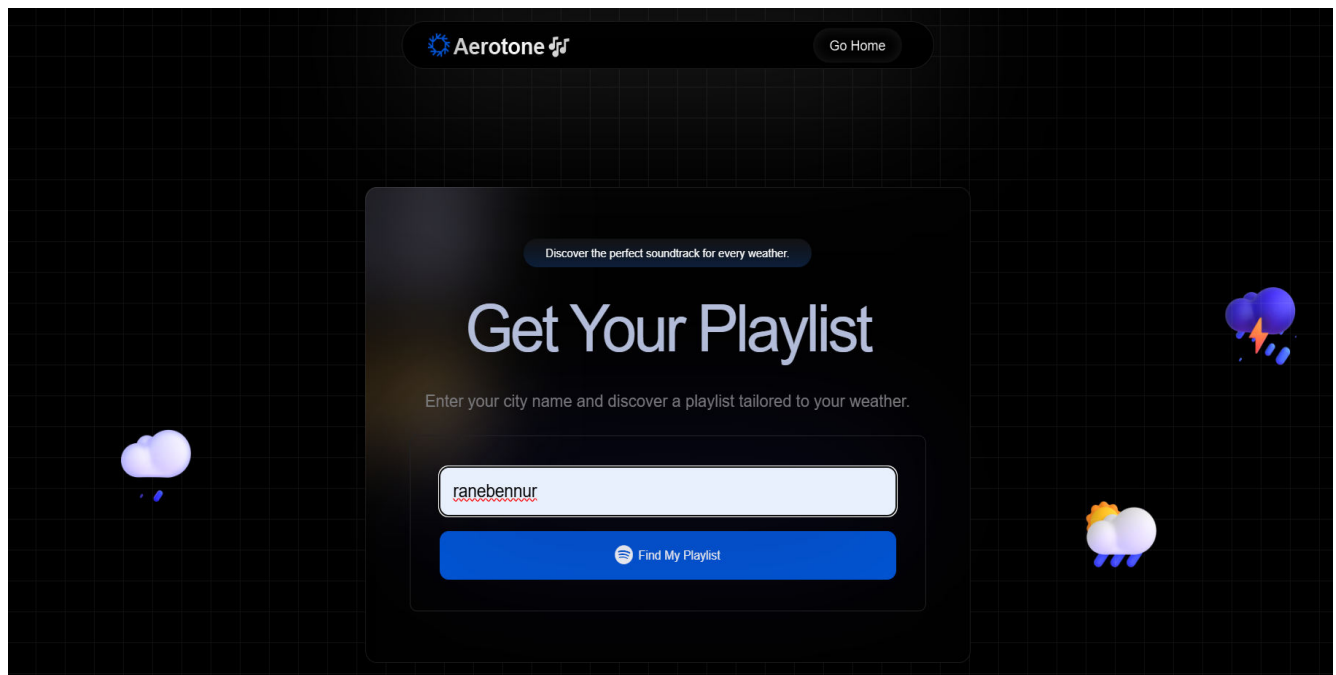


Fig2: Home page

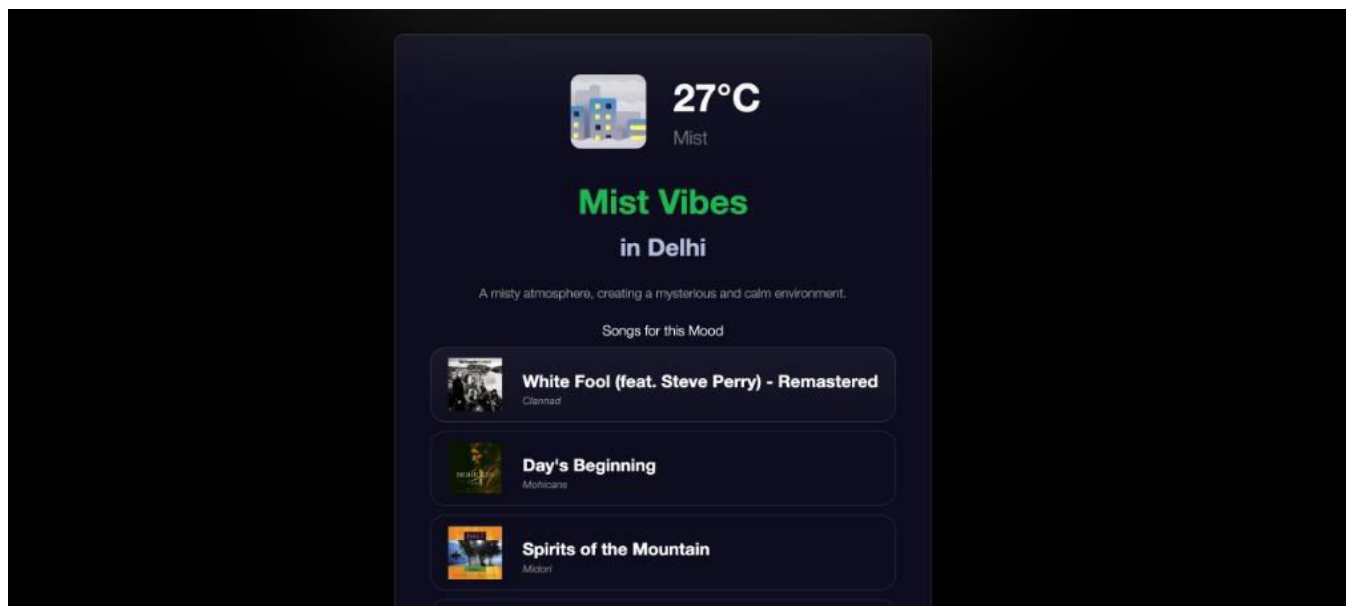


Fig3: Result page



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V. CONCLUSION

Weather-Based Music Recommendation demonstrates a novel approach to music recommendation systems, integrating weather data to personalize playlists. The project emphasizes the practical application of web technologies and APIs, showcasing its potential for real-world deployment.

Future enhancements could include incorporating machine learning for advanced recommendations, expanding music options, and supporting multilingual interfaces for global accessibility.

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