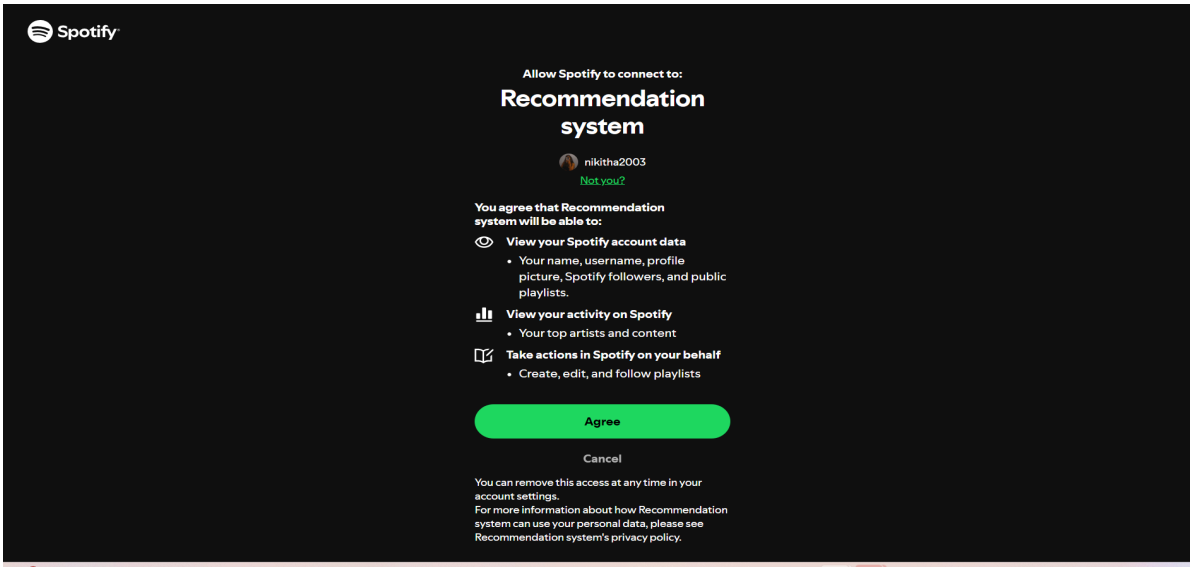
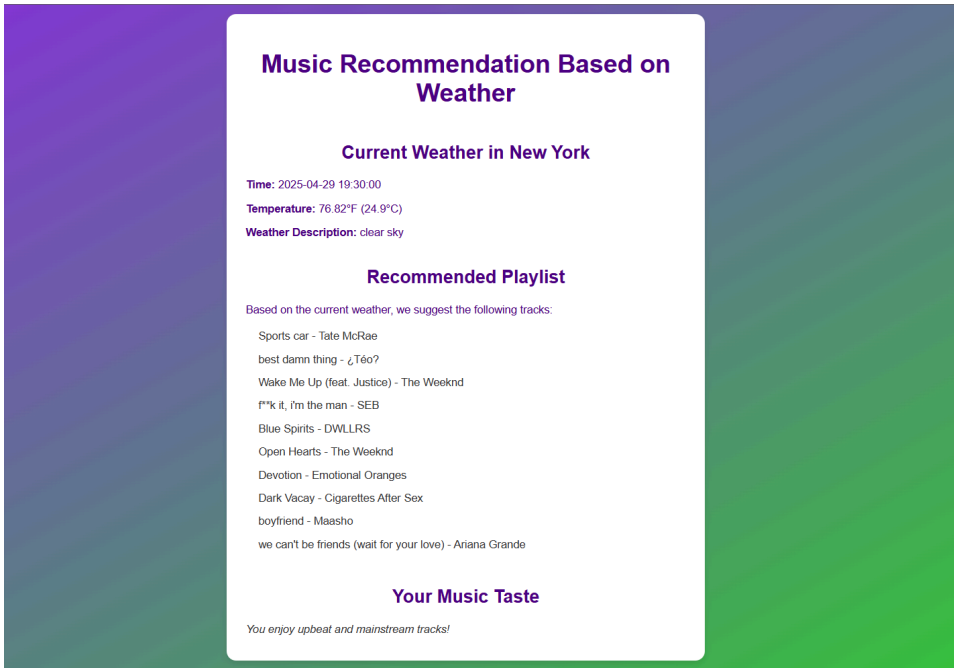
# AI Weather-Based Music Recommendation

The way we interact with music has come a long way, and with AI's growing influence, music recommendation systems can be more personalized than ever. Weather is something that can play a big factor in our daily moods and is overlooked in music recommendation platforms. This project introduces an AI-powered system that will take real-time weather changes into account to generate personalized music recommendations while also keeping in account the user's daily listening habits. By implementing weather data, this system will enhance a user's listening experience based on climate conditions, offering more responsive and immersive ways to enjoy music.

Though AI has revolutionized music discovery and personalization, current music recommendation systems mainly focus on user preferences and past listening history. While effective, they often overlook external factors, like the weather, which can have a strong effect on our moods and music choices. This project aims to fill that gap by integrating real-time weather data into the recommendation process, ensuring that the recommendations feel both natural and timely. By factoring in the weather data, the system seeks to provide music recommendations that also align with the mood set by the environment.

Below are some screenshots of the app design I have implemented, and context as to follow:






The two screenshots demonstrate key features of the AI-powered music recommendation system. The first screenshot shows the Spotify login screen for authorization, where users will grant the system permission to access their Spotify account data, which includes top tracks, artists, and managing playlists. The second screenshot showcases the system's UI, which provides personalized music recommendations based on current weather. For example, with a clear sunny sky in New York, the system suggests upbeat and mainstream tracks as follows. The system also describes the user's music taste, as one can see, "You enjoy upbeat and mainstream tracks!". This demonstrates how the system integrates real-time weather data to generate personalized playlists, enhancing the user's listening experience by aligning with both their preferences and the current weather data.

**Further Analyzation:** The system collects real-time weather data and analyzes it to categorize the weather into specific mood-based genres. User preferences are also taken into account to make the recommendations feel more natural. So, for example, Sunny weather triggers energetic, upbeat genres, while rainy weather results in slower, mellow music. As per the Trust and Safety mechanisms, the system will not store or misuse any of the user's personal data, such as location or listening habits. Data privacy will be taken into consideration, ensuring users are aware of what data is used for recommendations. The user interface is implemented to be simple and intuitive. The weather data (even location) is automatically fetched, and users are presented with a list of recommended songs based on the current weather situation. The interface will then allow users to view current weather information and the mood of the playlist it's generating.

# Why is it better than other LLM models - chatgpt

| Feature | MY system | CHAT |
|---|---|---|
| Personalization | Uses **real Spotify user data** (top tracks, listening habits) to personalize playlists. | Suggests generic playlists without access to user-specific data. |
| Live Weather Integration | Fetches **real-time weather** automatically and adapts song mood accordingly. | Can describe weather if asked, but cannot auto-fetch or use it dynamically. |
| Spotify API Integration | Directly interacts with Spotify (OAuth login, reading tracks, fetching audio features, creating playlists). | Cannot interact with Spotify without complex external linking. |
| Use of Audio Features | Filters tracks based on measurable attributes like **energy and valence for precise mood-matching.** | Only guesses mood based on song titles or artist names; no real feature-based filtering. |

Comparing my model to ChatGPT, my AI weather-based music recommendation system offers a more personalized music experience to users. It extracts real Spotify user data, including top tracks and listening habits, to curate customized playlists, while ChatGPT will only suggest a general list of songs without access to any user data. Additionally, my system integrates real-time weather data to curate this playlist and provide the users with more natural recommendations. My system utilizes specific audio features like energy and valence to match the music mood with weather, whereas GPT relies on assumptions based on song titles or artists.

**Similar Related Work:**

- **Pandora** offers mood-based playlists but lacks the integration of real-time weather and tailored accommodation to weather conditions.
- **DeepAI** is an AI-powered tool where you can chat with the bot to retrieve music related to whatever you input.

**Future Work:** Looking ahead, I plan on expanding the music recommendation system to include more platforms like Apple Music and/or YouTube Music. This will allow everyone to enjoy personalized music no matter which platform they prefer. Moreover, integrating a chatbot could make the experience more interactive, letting users ask for song suggestions or adjust their preferences in real-time. To give users more control, I also aim to add an option to turn off the weather-based recommendations, so they can enjoy music without the weather influence if they choose. These updates would make the system more user-friendly, adapting to a wider range of musical tastes and preferences.

**Conclusion:** The AI Weather-Based Music Recommendation system is a future approach to how we should experience music. Using weather data, users accustomed to personal preferences will have an enhanced music learning experience. By curating recommendations to the user's mood as affected by weather, the system provides a personalized music experience to all. Whether it's a rainy morning or sunny afternoon, the system will help you find the music that will feel just right. The system has potential across music streaming platforms and weather-based lifestyle apps, offering users a more lively way to enjoy music that fits both their mood and the weather in their daily agenda.