Real Time Weather Live Dashboard

1. Project Overview

This dashboard is a high-performance analytical tool designed to monitor atmospheric conditions across six strategic cities in Rajasthan: **Jaipur, Dausa, Sikar, Bundi, Jaisalmer, and Ajmer**. It integrates real-time API data with predictive modelling to provide a comprehensive meteorological overview.

2. Key Analytical Insights

A. Comparative Geographic Analysis

The dashboard enables a cross-regional comparison of weather patterns between East and West Rajasthan:

- **Arid vs. Semi-Arid Variations:** By comparing **Jaisalmer** (West) with **Jaipur/Dausa** (East), the dashboard identifies significant diurnal temperature ranges and humidity variances inherent to desert vs. inland climates.
- **Localized Trend Monitoring:** Stakeholders can track how weather systems move across the **Aravalli Range**, impacting cities like **Ajmer** and **Bundi** differently.

B. Seven-Day Predictive Modelling

The forecasting module uses historical data and current atmospheric pressure to project trends:

- **Trend Consistency:** The dashboard identifies whether a "Cold Wave" or "Heat Wave" is a transient event or a week-long trend.
- **Variance Analysis:** By displaying **High/Low cycles**, the dashboard provides insights into the "thermal inertia" of different urban environments (e.g., Sikar vs. Jaipur).

C. Atmospheric Health & Safety Metrics

Beyond temperature, the dashboard tracks critical environmental indicators:

- **Air Quality Index (AQI):** Monitors pollution levels, providing a vital health metric for densely populated areas like Jaipur and Ajmer.
- **Humidity & Wind Velocity:** Analysis "Feels Like" temperatures, which are critical for energy demand forecasting and agricultural planning in regions like Sikar.

3. Technical Features & Functionality

Feature	Insight Provided
Dynamic Multi-City Toggle	Allows instantaneous data switching without page reloads, demonstrating efficient state management.
Real-Time API Sync	Ensures that metrics like wind speed and cloud cover are pulled from live meteorological stations.
Interactive Forecast Charts	Uses line and bar visualizations to show the rate of change in temperatures over a 7-day period.
Threshold Alerts	Built-in logic to highlight "Extreme Conditions" (e.g., frost warnings in Jaisalmer or high-heat alerts in Bundi).

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4. Business & Operational Applications

- **Logistics & Supply Chain:** Predicting fog or heavy rain in the **Jaipur-Dausa** corridor to prevent transport delays.
- **Energy Management:** Anticipating temperature spikes to manage power grid loads for cooling/heating.
- **Agricultural Planning:** Helping farmers in the **Sikar and Jaisalmer** belts prepare for frost or sudden humidity changes that affect crop yields.
