**PROJECT – 3 :** WEATHER FORECAST WEBSITE

**AIM :** To create a “Weather Forecast website” which provides the information regarding the weather at any place using an API. This website development includes the usage of an API, which fetches the real time data of the weather at any place and forecasts the weather for the upcoming 5 days. Automatic location detection is to be enabled in this project to improve the versatility of the website.

**SKILLS REQUIRED :** HTML, CSS, JavaScript.

**EDITOR USED :** Visual Studio Code (VS Code) – Windows x64 Bit

**Weather Forecast website Documentation**

**Project Overview:**

The Weather Forecast Application is a web-based tool designed to provide users with real-time weather information for their current location and any other location they input. It utilizes HTML, CSS, and JavaScript to create an interactive and user-friendly interface. The application fetches weather data using an API and displays the forecast for the current day and the next five days.

**Features:**

*1. User Location Input:* Users can manually enter their city or location to get the weather forecast.

*2. Automatic Location Detection:* The application can automatically detect the user’s current location using the browser’s geolocation feature.

*3. Current Day Weather:* Displays weather details for the current day, including temperature, humidity, wind speed, and weather conditions.

*4. 5-Day Weather Forecast:* Provides a detailed weather forecast for the next five days.

*5. Responsive Design:* Ensures that the application is accessible and functional on various devices, including desktops, tablets, and mobile phones.

**Technologies Used:**

***Frontend***

- HTML: Used to structure the application’s content.

- CSS: Provides styling for the application, ensuring a visually appealing interface.

-JavaScript: Handles the application logic, including API calls, data processing, and DOM manipulation.

***API***

- Weather API: An external API service (such as OpenWeatherMap, WeatherAPI, etc.) is used to fetch real-time weather data based on user input or detected location.

**Application Flow:**

***1. Initialization:***

- The application loads and initializes necessary variables and event listeners.

- If geolocation permission is granted, the application fetches the user’s current location coordinates.

***2. User Location Input:***

- The user can enter a city or location in the input field and submit the form.

- An event listener captures the input and triggers the API call to fetch weather data for the specified location.

***3. Automatic Location Detection:***

- The application uses the browser’s geolocation API to get the user’s current latitude and longitude.

- These coordinates are used to make an API call to fetch the weather data for the current location.

***4. API Call:***

- The application sends a request to the weather API with the location data (city name or coordinates).

- The API returns a response containing the weather data.

***5. Data Processing:***

- The returned weather data is processed to extract relevant information such as temperature, humidity, wind speed, and weather conditions.

- Forecast data for the next five days is also extracted.

***6. Display Weather Data:***

- The current weather and forecast data are dynamically added to the HTML elements in the application.

- The application updates the UI to display the weather information to the user.

**User Interface Components:**

- Header: Contains the application title and navigation links (if any).

- Search Bar: Allows users to input a location manually.

- Current Location Button: A button that triggers the geolocation feature to detect the user’s current location.

- Weather Display Section:

- Current Day Weather: Displays current temperature, weather conditions, humidity, and wind speed.

- 5-Day Forecast: A section that displays the weather forecast for the next five days in a tabular or card format.

- Footer: Contains credits and links to the API service used.

**Error Handling:**

- Invalid Location: If the user enters an invalid location, an error message is displayed.

- Geolocation Denied: If the user denies geolocation permission, an appropriate message is displayed, and the user is prompted to enter the location manually.

- API Errors: Handles API errors gracefully, displaying a user-friendly message in case of network issues or invalid API responses.

**Enhancements and Future Features:**

1. Weather Alerts: Notify users of severe weather conditions or alerts in their area.

2. Units Toggle: Allow users to switch between Celsius and Fahrenheit.

3. Historical Data: Provide weather data for previous dates.

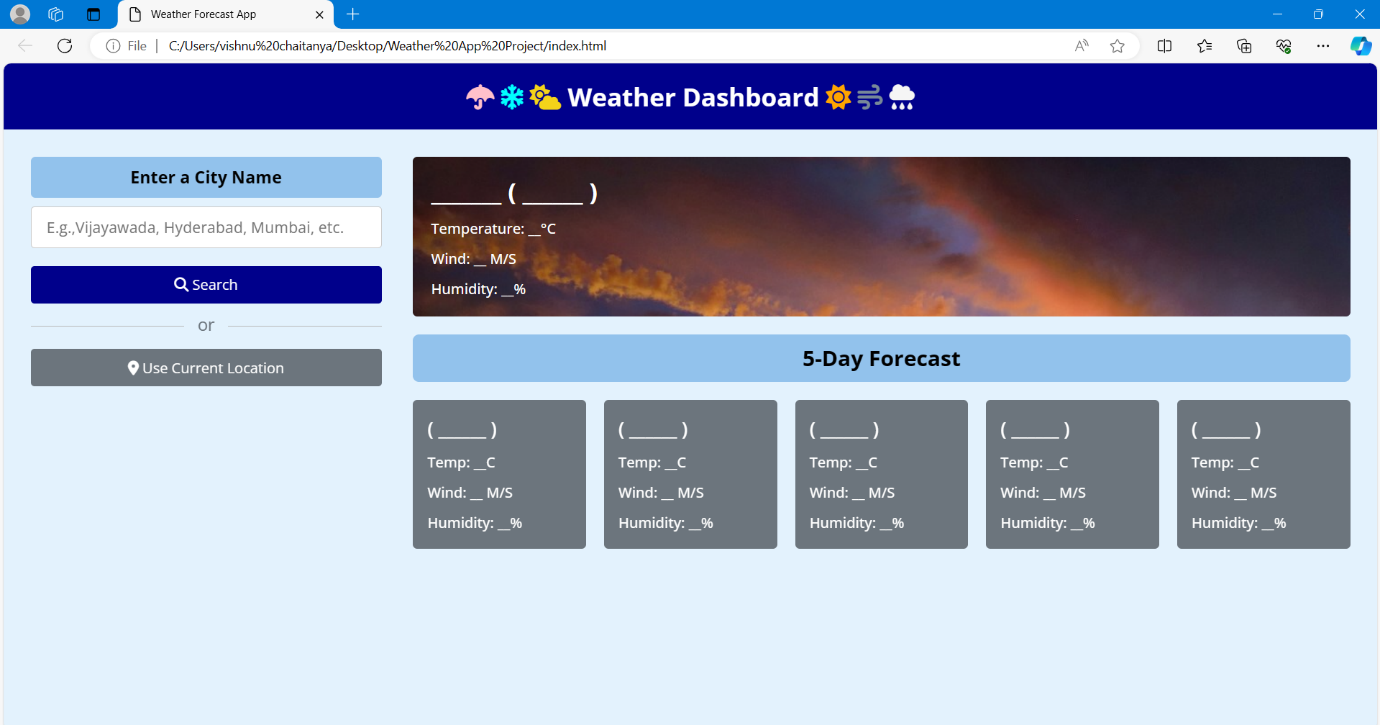
4. Theme Options: Allow users to switch between different themes (light and dark mode).

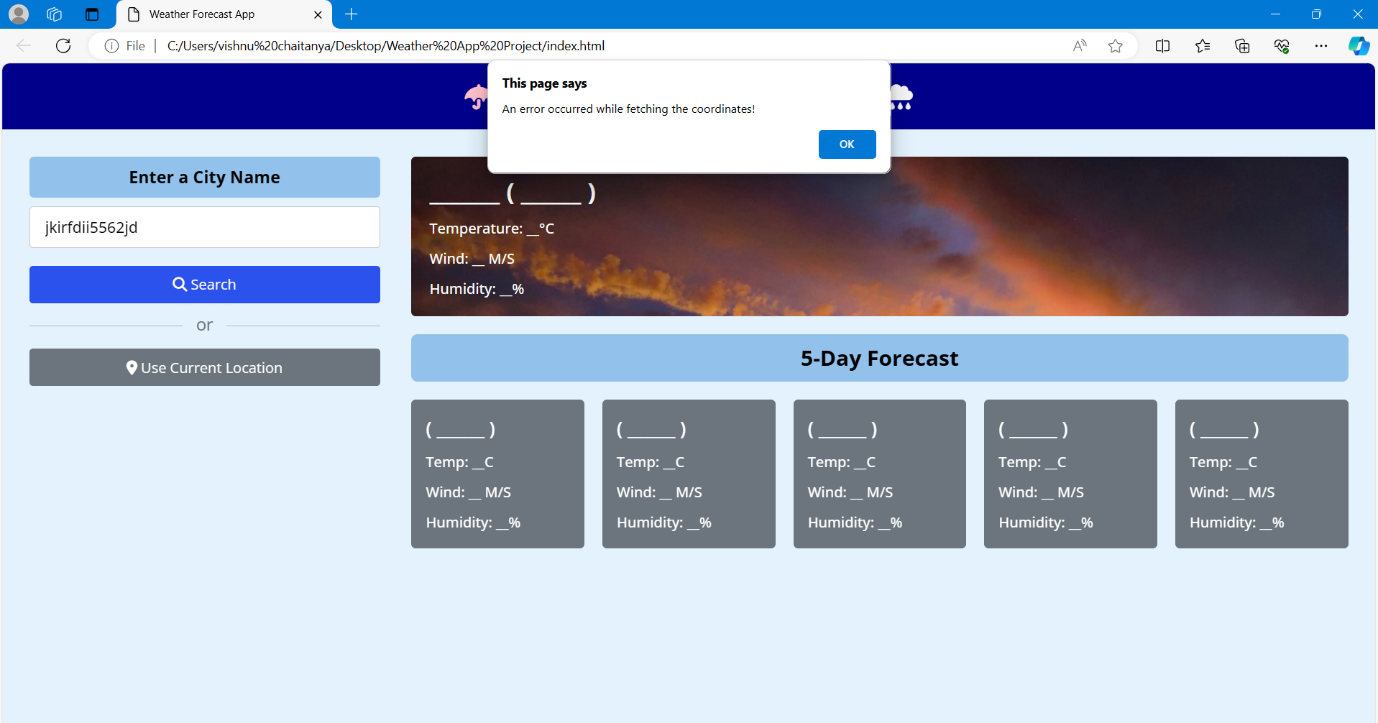
5. Localization: Support multiple languages for a broader user base.

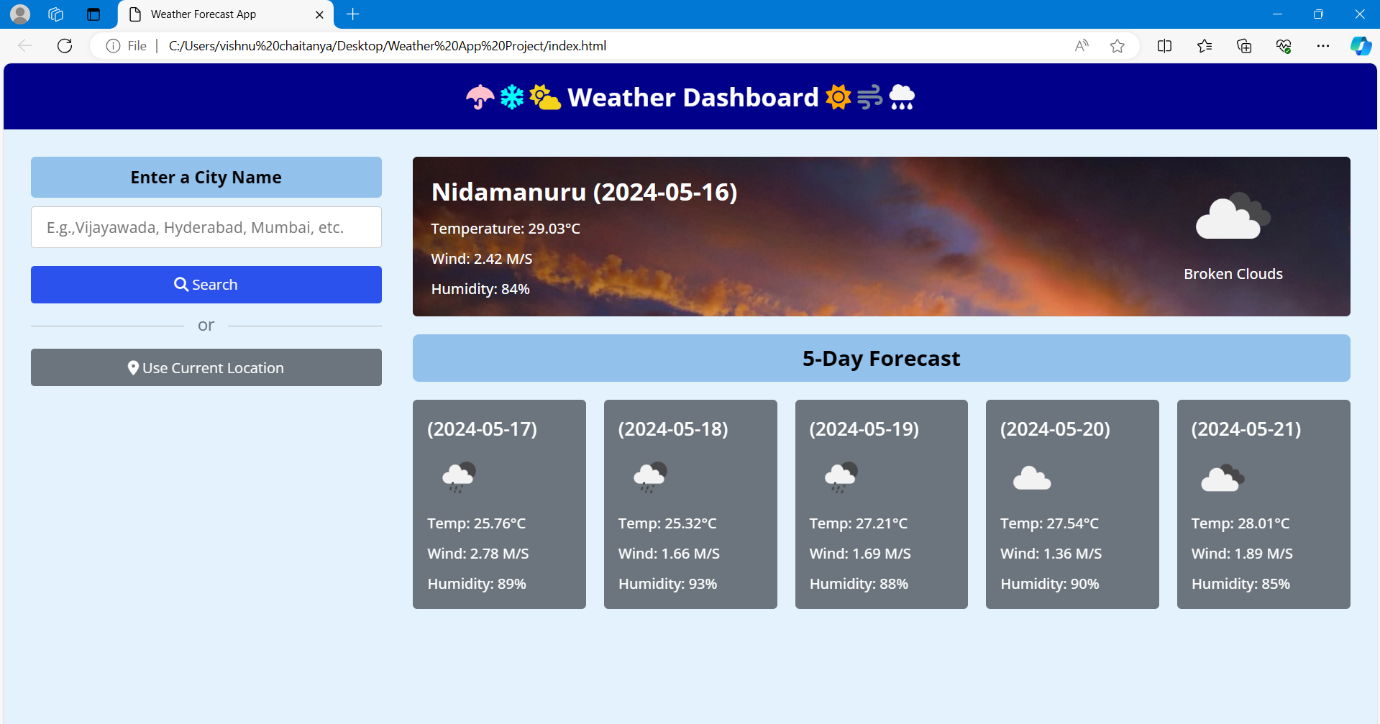
**Conclusion:**

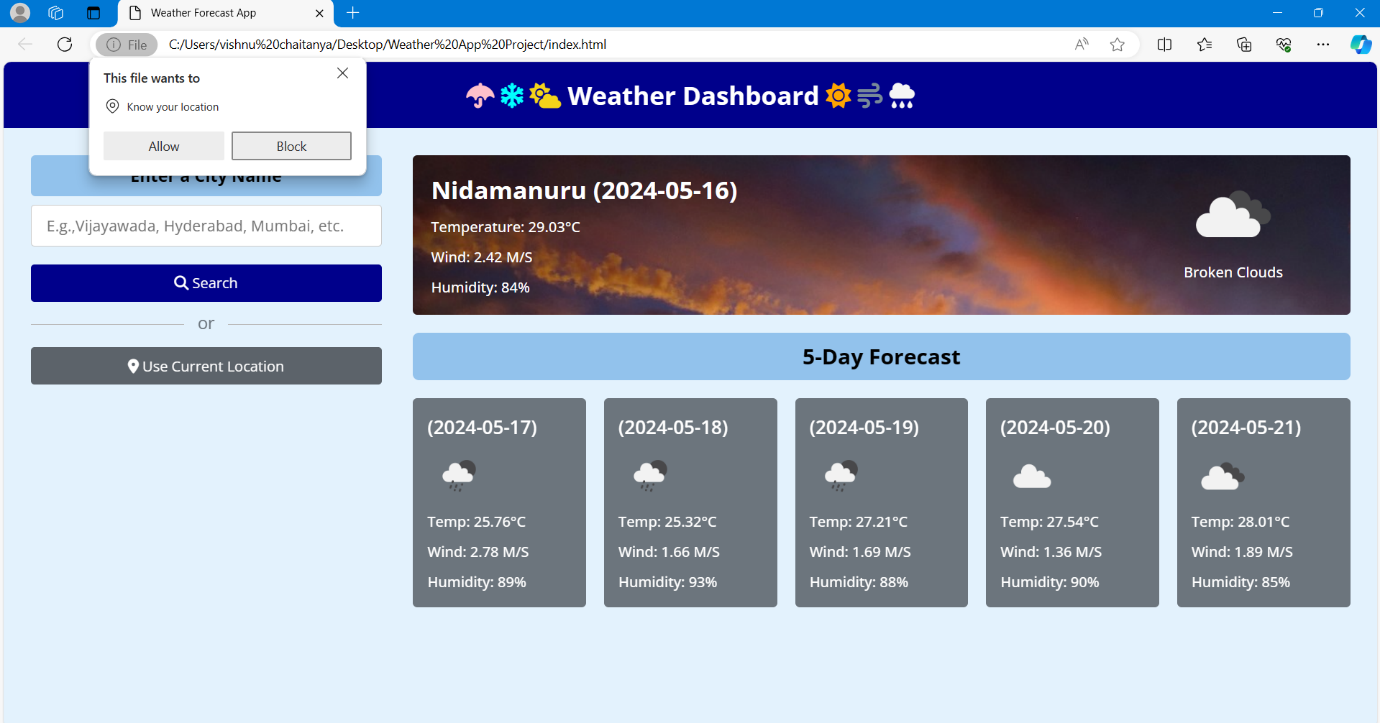
The Weather Forecast Application is a robust tool that leverages modern web technologies to deliver accurate and timely weather information. By integrating user input and automatic location detection, it provides a versatile and user-friendly experience. With potential future enhancements, the application can become even more comprehensive and widely used.

**OUTPUT:**

****

****

****

****