MINOR PROJECT REPORT (CS3PC04)
WEATHER CHECKER

To be submitted in partial fulfilment of the requirements for the degree of

Bachelor of Technology

MEDI-CAPS UNIVERSITY, INDORE

Jan-May , 2024

By

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Mr. Yatish Jain Sir

DECLARATION BY THE CANDIDATE

We declare that this is entitled "Weather Checker" our own work conducted under the supervision of Mr. Rajesh Kharche (Supervisor) at Medi-Caps University, Department of Computer Application approved by HOD Department of Computer application, Project Coordinator, and Faculty of Project. We have put in more than 75% of attendance with our supervisor at the University Department of Computer application. Further declare that to the best of our knowledge, this project report does not contain any part of any work which has been submitted for the award of any degree either in this University or in any other University without proper citation.

Divyani Jaiswal (EN21CS301255)

Divyanshu Bhawsar

(EN21CS301258)

Place:

Date:

<u>CERTIFICATE OF THE SUPERVISOR</u>

This is to certify that the work entitled " Weather Checker " is a piece of project work done by Ms. Divyani Jaiswal and Mr. Divyanshu Bhawsar Under my guidance and supervision for the degree of Btech from Medi-Caps University Indore (M.P.) I certify that the candidate has put in an attendance of more than 75% with me.

Signature of the Supervisor   **Signature of the Faculty**

Name_____   **Name_____**

Signature of the Project Coordinator   **Signature of the HOD**

Name_____   **Name_____**

Place:

Date

<u>ACKNOWLEDGEMENT</u>

We express our sincere indebtedness towards our project coordinator **Mr. Yatish Jain** sir, Computer Application, Medi-Caps University, Indore for his invaluable guidance, suggestions and supervision throughout the project. Without his kind patronage and guidance, the project would not have taken shape. We would also like to express our gratitude and sincere regards for his kind approval of the project, time to time counselling and advices.

We would also like to thank our HOD **Mr. Ratnesh Lithoriya** sir, Computer Science, Medi-Caps University, Indore for his counselling and support from time to time. Last but not the least, we would like to convey our heartfelt thanks to almighty and the friends and family who helped and supported us during the completion of this minor project.

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Btech CSE- core VI Sem.

ABSTRACT

Title: Weather Checker

Weather Checker is a cutting-edge website designed to deliver real-time and accurate weather information. With a user-friendly interface, the website application caters to both casual users and weather enthusiasts, offering features such as customizable location-based forecasting, severe weather alerts, and detailed hourly and daily forecasts. The website stands out by incorporating user-generated content, allowing individuals to contribute real-time updates and photos, fostering a sense of community and enhancing overall reliability. By combining accuracy, user-friendliness, and community engagement, Weather Checker emerges as an indispensable tool for those who prioritize staying informed about the dynamic weather conditions that impact their daily lives. Whether it's planning a weekend getaway, a daily commute, or staying alert to severe weather events, Weather Checker ensures users are well-prepared and confident in their decision-making.

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Introduction

"Weather Checker" is the website application of science and technology to predict the conditions of the atmosphere for a given location and time. People have attempted to predict the weather informally for millennia and formally since the 19th century. Weather forecasts are made by collecting quantitative data about the current state of the atmosphere, land, and ocean and using meteorology to project how the atmosphere will change at a given place. It is very important to get educated on the current weather situation of a particular location as preferred since it affects the day to day life of everyone. It is more effective if we can get quickly updated on current weather status of a required location, as it makes it easy to handle not only our activities, but also our livelihoods too. A huge problem that we are facing nowadays is inability to know real weather status in such places. So if we need to know the current situation in a certain place, it is better to ask from a person who is in that area recently or currently. He is a better source than any prevailing weather information.

In order to minimize the risk of distorted daily plans and arrangements, owing to changes in weather, there is need to take close looks daily weather condition.

<u>Problem Statement</u>

The Weather Checker will only display the temperature and weather. While some weather website provide a great deal of detail, this website will provide only the most basic and essential information. The website simplicity is its biggest strength, making it easy to use.

What problem does the website address?

Most weather website are packed with information and details that can be overwhelming for some users. Our website solves this issue by providing only the most crucial weather information.

Who can benefit from this website?

This website may be beneficial to individuals who require quick access to weather data without being overwhelmed with too much information.

Why Weather Checker is Important

The weather checker is essential for daily transit, travel, and safety purposes. A clear understanding of the weather makes it easy to plan travels, outdoor activities, and prepare for emergencies.

- **Reduce weather-related risks**

The website can help reduce weather-related accidents and injuries by providing essential weather requirements and information.

- **Plan outdoor activities seamlessly**

Our website will provide important details, such as temperature and weather conditions, making it easy to plan and execute outdoor activities.

- **Stay informed**

Our weather checker website will keep users up-to-date on new developments in the weather before stepping out.

Why this particular topic chosen

Introduction:

The choice of a Weather Checker for our minor project holds significant relevance in the context of today's dynamic technological landscape. Weather plays a crucial role in our daily lives, influencing our activities, travel plans, and overall well-being. Developing a website that provides real-time weather information for a specific location aligns with the growing demand for accessible and accurate meteorological data.

Practical Significance:

Weather conditions impact various sectors, including agriculture, transportation, tourism, and general public activities. By creating a Weather Checker, you aim to provide users with up-to-date information on temperature, humidity, and wind speed for a chosen location. This tool can assist individuals in making informed decisions, such as planning outdoor activities, choosing appropriate clothing, or preparing for weather-related events.

User-Centric Design:

The website's user interface will be designed with a focus on simplicity and accessibility. Users should be able to easily input their desired location and retrieve relevant weather data. This project allows you to explore principles of user experience design and human-computer interaction, ensuring that the information is presented in a clear and intuitive manner.

Technological Exploration:

Implementing a Weather Checker involves integrating with weather APIs or utilizing data from meteorological services. This project offers an opportunity to delve into API integration, data retrieval, and data visualization techniques. Additionally, you can explore how to handle and display real-time data on a web platform, enhancing your skills in web development.

Learning Outcomes:

The development of the Weather Checker will enhance our understanding and proficiency in several key areas, including:

- Web development technologies (HTML, CSS, JavaScript)
- API integration and data retrieval
- Front-end frameworks (optional, depending on your chosen tech stack)
- Data visualization techniques
- User experience design principles

Relevance to Current Trends:

With the increasing reliance on digital tools and the widespread use of smartphones, having easy access to weather information is becoming a standard expectation. Our project aligns with this trend, catering to the contemporary need for quick and accurate weather updates through a user-friendly online platform.

<u>Objective and Scope</u>

Objective:

The objective of the minor project, "Weather Checker," is to develop a user-friendly and responsive weather checking website application. Using a technology stack comprising HTML, CSS, JavaScript, and React JS, along with integration of the OpenWeatherMap API, the project aims to provide users with real-time and accurate weather information. The primary goal is to create an interactive platform that enhances user experience through dynamic features and seamless navigation.

Scope:

- **Real-Time Weather Information:** Implementing OpenWeatherMap API to fetch and display up-to-date weather data, including current conditions and forecasts.

- **User-Friendly Interface:** Designing an intuitive and visually appealing user interface using HTML, CSS, and React JS to ensure ease of use for individuals with varying levels of technical expertise.

- **Interactivity:** Enhancing user engagement through interactive elements powered by JavaScript and React JS, allowing users to explore weather details, switch between locations, and receive live updates.

- **Cross-Platform Compatibility:** Ensuring the application is accessible across multiple devices and platforms, providing a consistent user experience for desktop and mobile users.

- **Efficient Data Presentation:** Organizing and presenting weather information in a clear and concise manner, facilitating quick comprehension of current conditions and future forecasts.

- **Error Handling and Resilience:** Implementing robust error-handling mechanisms to address potential issues, such as API disruptions or data retrieval failures, ensuring a reliable user experience.

- **Learning Opportunity:** Providing an opportunity for project developers to gain hands-on experience with front-end technologies (HTML, CSS, JavaScript, React JS) and API integration (OpenWeatherMap), fostering skill development and practical knowledge.

Methodology

The website was developed using HTML, CSS, and JavaScript, React.js and then integrated with OpenWeatherMap API, which provides real-time weather information. User data is analysed to determine the user's location to display relevant weather information.

HTML	Creating the structure of the website
CSS	Creating the structure of the website
JavaScript	Website lying logic and integration with OpenWeatherMap API
React.js	JavaScript framework used for interactive user interfaces with less code .
Open Weather Map API	Provides live weather data through API

Process Description

The website processes the user's location to obtain relevant weather information using OpenWeatherMap API. The website then displays the temperature and relevant weather conditions for the user.

- **Collect User Location**

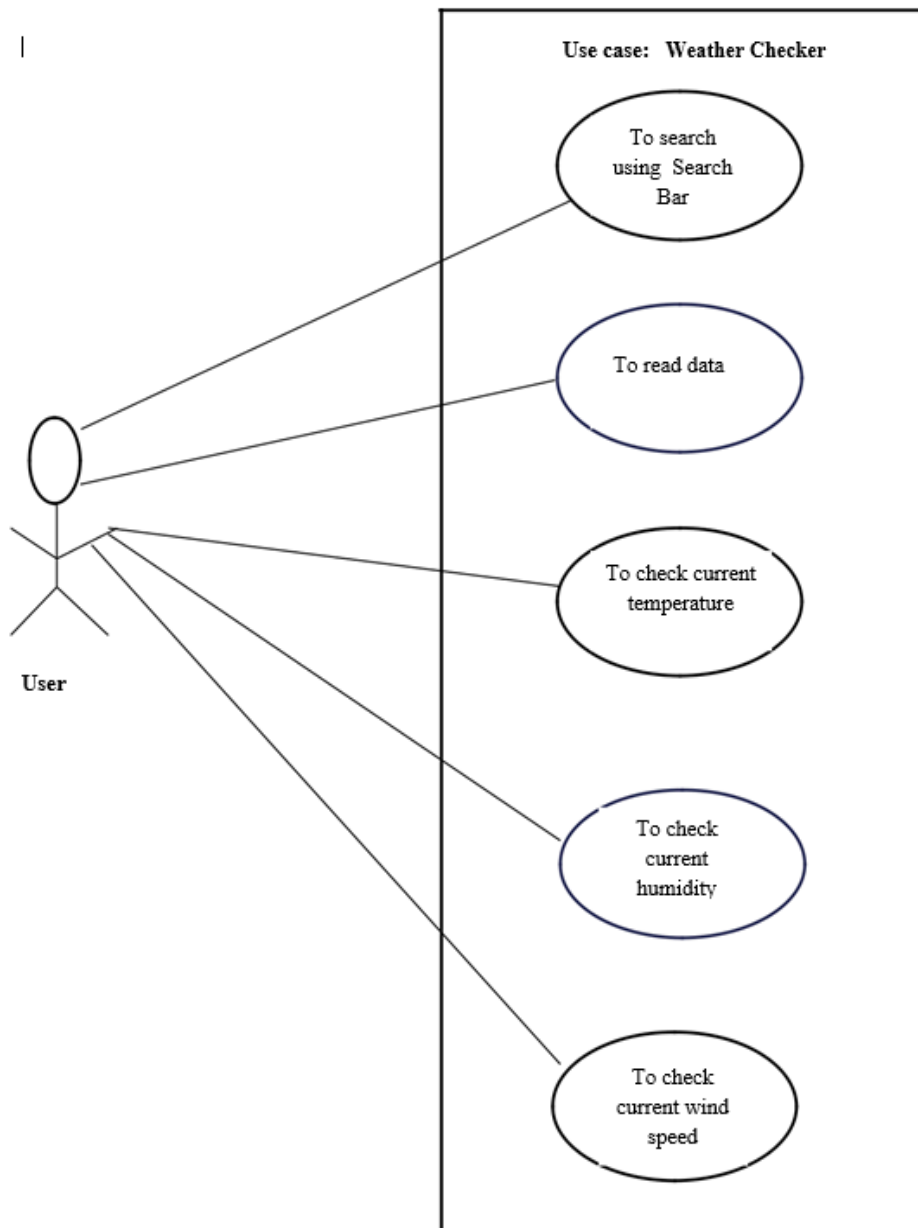The website retrieves the location data through search bar.

- **Retrieve Weather Data**

The website then requests current weather data from OpenWeatherMap API, using the user's geographic coordinates.
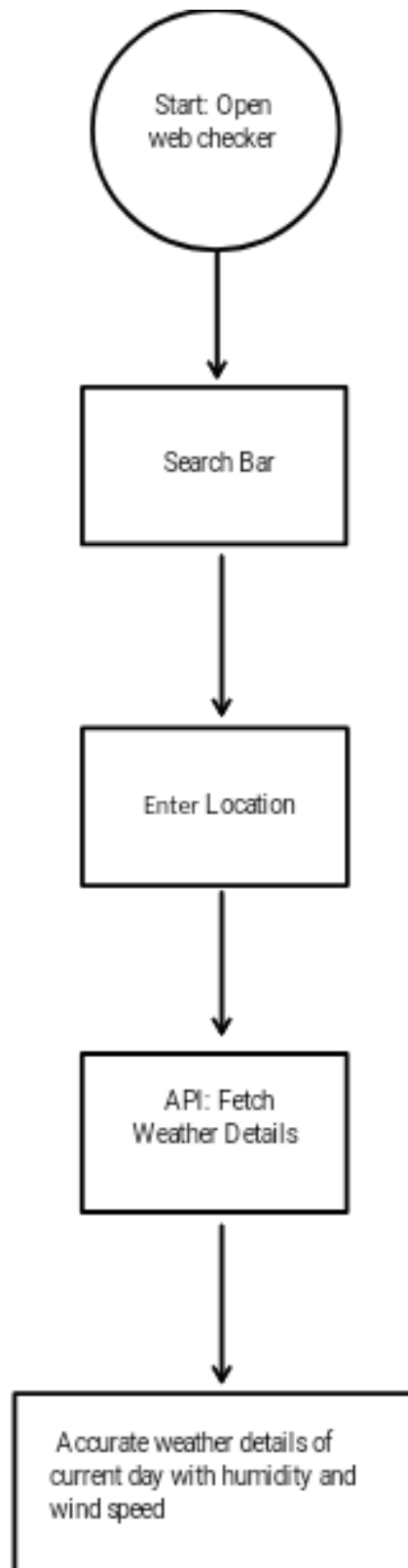
- **Display Weather Information**

The website then displays the temperature and weather condition for the user, utilizing the user's geographic coordinates.

Use Case

System Architecture

```
        ┌─────────────┐
        │  Start: Open │
        │  web checker │
        └──────┬──────┘
               │
               ▼
        ┌─────────────┐
        │  Search Bar  │
        └──────┬──────┘
               │
               ▼
        ┌─────────────┐
        │ Enter Location│
        └──────┬──────┘
               │
               ▼
        ┌─────────────┐
        │  API: Fetch  │
        │ Weather Details│
        └──────┬──────┘
               │
               ▼
  ┌───────────────────────────┐
  │ Accurate weather details of│
  │ current day with humidity and│
  │ wind speed                 │
  └───────────────────────────┘
```

Functional and Non-functional Requirements

The following lists of requirements outline the conditions necessary for this website to function successfully:

Functional Requirements:

- Display current weather conditions and detailed forecasts for specified locations.

- Allow users to input and select different locations, with an option to save preferred locations.

- Implement real-time updates latest weather information.

- Create an interactive, visually appealing interface using React JS with user-friendly elements.

Non-Functional Requirements:

- Achieve fast loading times, minimize latency, and optimize code and resources for performance.

- Design for scalability to accommodate a growing user base and potential feature expansions.

- Conduct usability testing for users of varying technical proficiency and incorporate user feedback.

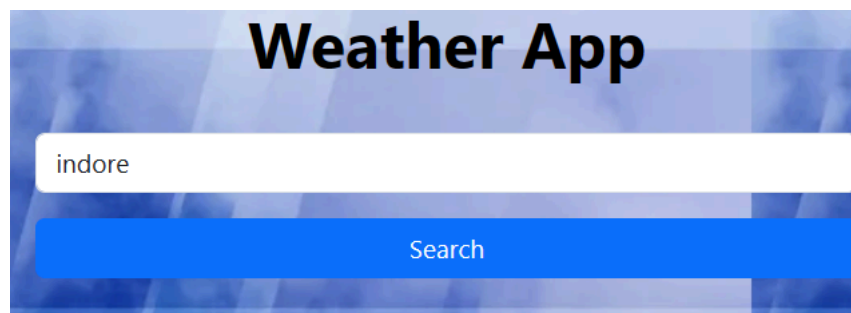- Ensure compatibility with major browsers and devices for a broad user reach.

UI Interface without Internet
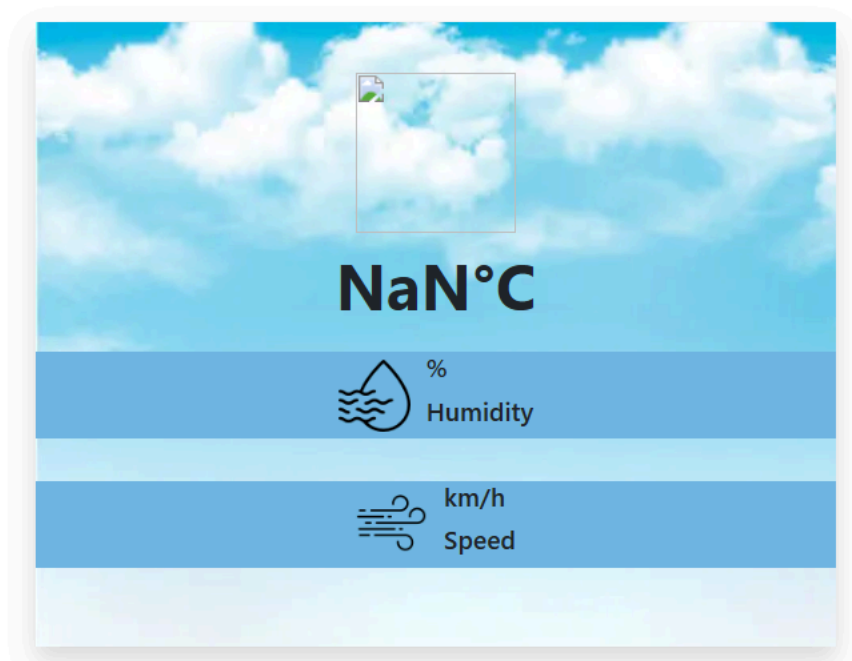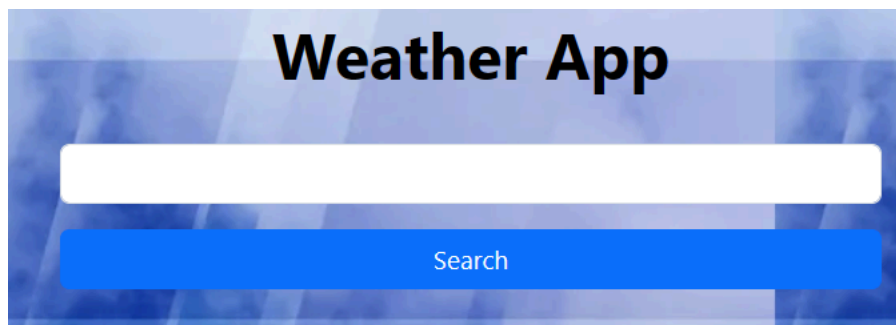
UI Interface with Default input
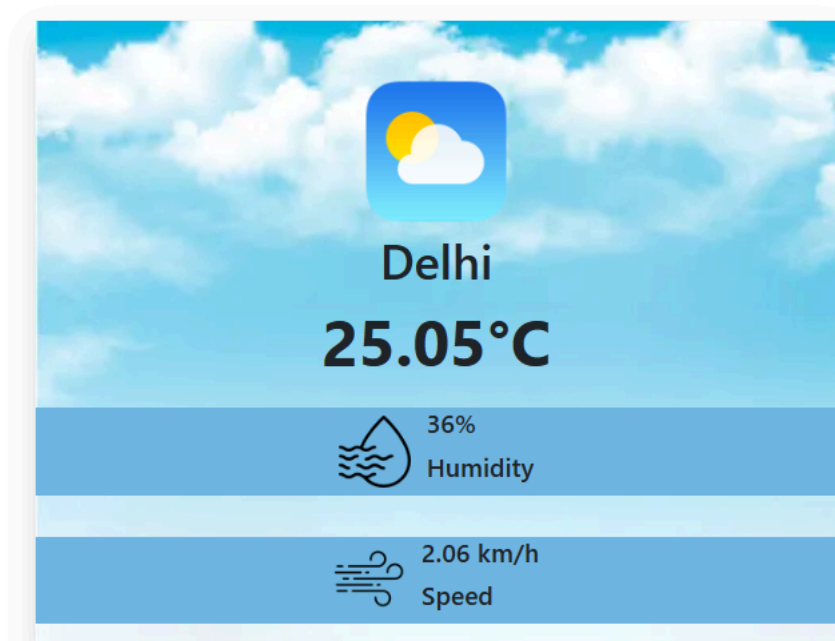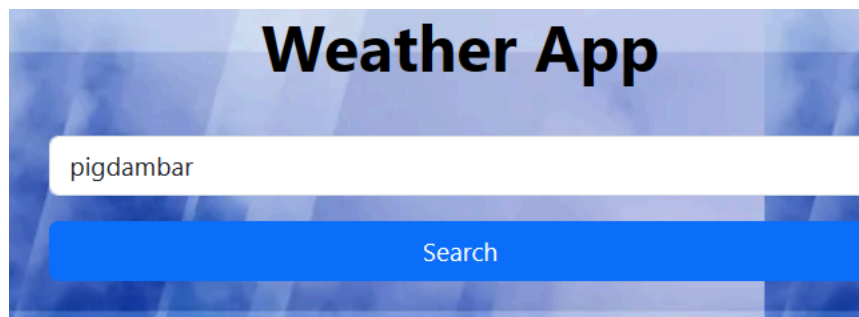
UI Interface with User Input

Hardware and Software Used

The website integrates with OpenWeatherMap API using front-end / back-end technology like HTML, CSS, JavaScript, React. JS , API

- **Front End:**

The front-end technology used includes HTML, CSS, React.js and JavaScript, which are integrated with OpenWeatherMap API.

- **Software:**

Any Operating System(Windows, Linux, Mac, Os),

Visual code (IDE)

- **Hardware:**

8GB RAM or more , Keyboard , Mouse.

<u>Limitations</u>

- **Forecast Accuracy:** The accuracy of weather forecasts depends on the data provided by the external API, and occasional discrepancies may arise.

- **Data Security:** Handling user data and interactions requires careful consideration for data security, especially when relying on third-party APIs.

- **Offline Functionality:** The application may face limitations in providing weather information when users are offline, as it heavily relies on real-time data from the OpenWeatherMap API.

While the website is useful, it has some limitations. For example, it may not provide enough detail for those who need more than the temperature and weather condition. Additionally, it's reliant on a stable internet connection, and the mobile website application may require a constant power supply.

<u>Advantages</u>

By utilizing HTML, CSS, and React JS, the weather application achieves a user-friendly interface with a visually appealing design. Integration with the OpenWeatherMap API ensures real-time updates, providing accurate and current weather information. The use of JavaScript and React JS enhances interactivity, offering features like live updates and dynamic user interactions. Additionally, the application's cross-platform compatibility, thanks to web technologies, ensures accessibility across various devices. In summary, the combination of these technologies results in a visually pleasing, interactive, and accessible weather application with real-time data updates.

- Real time weather information
- Cross-platform compatibility,
- Hourly weather information
- Can check for every location on planet
- We can check humidity level
- You can also check wind speed

Disadvantages

The weather application faces a dependency risk due to its reliance on the OpenWeatherMap API, making it vulnerable to potential disruptions or downtime. Additionally, being a minor project, it may have limited features compared to comprehensive weather applications, potentially restricting its overall functionality. Scalability challenges could arise with the chosen technology stack, especially as the project grows, potentially posing issues in handling a larger user base or increased data complexity. These considerations highlight potential areas for improvement and future development.

- Wrong inputs will affect the project outputs.

- Internet Connection is mandatory

- Cannot make Widgets

- Cannot fetch Historic data

- 3rd party data dependency (API).

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<u>Future Scope</u>

Weather applications will become more intuitive and user-friendly, using visualizations and other tools to help users understand complex weather data more easily. This will make weather information more accessible and understandable for everyone, leading to better-informed decisions and actions. Overall, the future scope of weather applications is bright, with continued innovation and advancement in this field expected in the coming years

In the future, a majority of people in India are likely to rely extensively on weather forecast applications. As you can see, the traditional seasonal cycles are undergoing significant changes over time. If we envision this application on a larger scale, it could offer live emergency updates, a more efficient user interface, comprehensive weather history and forecasts for up to 15 days.

<u>Conclusion</u>

In conclusion, a simplified web website application designed for displaying the temperature and weather condition using OpenWeatherMap API and HTML, CSS, JavaScript ,React.JS front-end technology has been successfully created. By using these tools, the website was able to provide essential weather information at the user's location in a straightforward interface.

<u>BIBLIOGRAPHY</u>

For successfully completing our minor project we have taken help from the following website and book:-

Book:

Meloni and Kyrin's "HTML,CSS and JavaScript All in One".

Website:

 https://www.javatpoint.com/reactjs-tutorial

Website

https://levelup.gitconnected.com/weather-website-in-react-jsca668ae86b14

Website:

https://www.khanacademy.org/computing/computerprogramming/html-css