**A PROJECT REPORT**

On

Weather Forecast Web application

**in partial fulfillment for the award of the degree**

**of**

**B.Tech CSE(LE)**

**From Second Year COMPUTER SCIENCE AND TECHNOLOGY**

By

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**Course Title: Theme Project**

**11/23**



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**CERTIFICATE**

This is to certify that the project titled “Weather Forecast Web application” is the bonafide work carried out by Sayar Debbarma, Partha Biswas, Kanak Acharjee, Mariam Kalai, Chayana Debbarma, students of B.Tech CSE (LE) of Department of Computer Science and Engineering, The ICFAI University, Tripura during the academic year Semester-3, 2023 - 2026, in partial fulfillment of the requirements for the award of the degree of B Tech CSE (LE) and that the project has not formed the basis for the award previously of any other degree, diploma, fellowship or any other similar title.

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**The ICFAI University, Tripura**

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### **Declaration of Student**

I hereby declare that the project entitled “Weather Forecast Web Application” submitted for the B.Tech CSE (LE) degree is my original work and the project has not formed the basis for the award of any other degree, diploma, fellowship or any other similar titles.

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## **Abstract**

This project presents the development of a weather forecast application that leverages the power of **HTML, CSS, RapidAPI,** and **JavaScript** to provide users with a comprehensive and user-friendly weather information portal. By seamlessly integrating **RapidAPI's weather API,** the application retrieves real-time weather data, including current conditions, five-day forecasts, and detailed weather parameters such as humidity, pressure, and wind speed.

The application's intuitive design and informative presentation empower users to access accurate and up-to-date weather information with ease.

This project exemplifies the potential of web technologies in delivering practical and user-centric applications.

Overall, it provides a clear overview of the project. It highlights the key technologies used **(HTML, CSS, RapidAPI, JavaScript),** the functionalities of the application **(retrieving weather data, displaying current and forecast information),** and the target audience **(users seeking weather information).**

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## **Introduction**

### 1.1 **Problem Defination**

The problem definition of a weather forecast project is to develop a system that can accurately predict the future state of the atmosphere for a given location and time. This is a complex problem due to the chaotic nature of the atmosphere and the vast amount of data that must be processed.

### **1.2 Project Overview**

* Real-time weather data: Implement a reliable data source to fetch current weather conditions for specified locations.
* Location flexibility: Allow users to enter city names or geographical coordinates to retrieve weather information for their desired locations.
* Intuitive interface: Design a user-friendly interface that is easy to navigate and understand, providing clear and concise weather information.
* Visual representation: Incorporate visual elements such as icons, graphs, or charts to enhance the presentation of weather data.
* Customization options: Provide users with options to customize the display of weather information, such as temperature units, language preferences, and notification settings.
* Multiple weather parameters: Display a comprehensive range of weather parameters, including temperature, humidity, precipitation, wind speed, and UV index.
* Forecasting feature: Implement a forecasting feature that provides predictions for upcoming weather conditions, allowing users to plan their activities effectively.
* Mobile optimization: Optimize the application for mobile devices to ensure seamless access and functionality across various screen sizes and platforms.

### **1.3 Hardware Specifications:**

#### ***Client-side***:

A standard web browser running on a personal computer, laptop, or mobile device can access the weather forecast application. No specialized hardware is required on the client-side.

#### ***Server-side:***

The server-side component of the application, which handles data retrieval and processing, can be hosted on a variety of hardware configurations, ranging from a single server to a distributed cloud infrastructure. The specific hardware requirements will depend on the expected traffic volume and computational demands of the application.

### **1.4 Software Specifications:**

#### ***Client-side***:

Web browser: A standard web browser with support for HTML5, CSS3, and JavaScript is required to render the application's user interface and interact with the server-side component.

JavaScript runtime: A JavaScript runtime environment, such as Node.js or V8 Embedded, is required to execute the JavaScript code that drives the application's functionality.

#### ***Server-side***:

Web server: A web server, such as Apache or Nginx, is required to host the application's web pages and handle incoming HTTP requests.

Programming language: A programming language, such as Python, Java, or PHP, is used to develop the server-side code that handles data retrieval from RapidAPI and processes it into a format suitable for the client-side application.

RapidAPI client library: A RapidAPI client library, available for various programming languages, is required to interact with the RapidAPI platform and retrieve weather data.

## **Literature Survey**

### **2.1 Existing System:**

#### ***Traditional weather websites***:

Most people rely on traditional weather websites or mobile apps to get weather information. These websites and apps typically provide current weather conditions, forecasts for the next few days, and additional information such as radar images and weather alerts.

#### ***Limitations***:

The major limitation of traditional weather websites and apps is that they often provide limited customization options and may not be as user-friendly as a custom-built application. Additionally, these websites and apps may not be able to access and process real-time weather data as quickly as a custom application.

### **2.2 Proposed System:**

#### ***Custom weather forecast application:***

A custom weather forecast application using HTML, CSS, JavaScript, and RapidAPI would provide a more personalized and interactive experience for users. The application could be tailored to specific user needs and preferences, and it could access and process real-time weather data from RapidAPI.

#### ***Benefits***:

The proposed system would offer several benefits over traditional weather websites and apps, including:

Customization: The application could be customized to display the user's preferred weather parameters, units of measurement, and location.

Real-time data: The application could access and process real-time weather data from RapidAPI, providing users with the most up-to-date information.

Interactive features: The application could include interactive features such as maps, charts, and graphs to help users visualize weather data.

Mobile optimization: The application could be optimized for mobile devices, providing users with access to weather information on the go.

### **2.3 Feasibility Study:**

#### ***Technical feasibility:***

The proposed system is technically feasible using the available technologies. HTML, CSS, and JavaScript are well-established web development technologies, and RapidAPI provides a reliable and easy-to-use platform for accessing weather data.

#### ***Economic feasibility:***

The proposed system can be developed and maintained at a reasonable cost. The use of open-source technologies and cloud-based infrastructure can help to reduce costs.

#### ***Operational feasibility:***

The proposed system can be operated and maintained by a team of web developers and data scientists. The use of cloud-based infrastructure can help to simplify operations and maintenance.

#### ***Schedule feasibility:***

The proposed system can be developed and deployed within a reasonable timeframe. The use of agile development methodologies can help to ensure that the project is completed on time and within budget.

## **System analysis & Design**

### **3.1 Requirement Specifications:**

#### ***User Interface (UI):***

* The application should have a user-friendly interface that is easy to navigate and understand.
* The interface should be visually appealing and consistent with the overall design of the application.
* The interface should be responsive and adapt to different screen sizes and devices.

#### ***Data Access***:

* The application should be able to access real-time weather data from RapidAPI.
* The application should be able to access historical weather data for a specified location.
* The application should be able to access weather data for multiple locations simultaneously.

#### ***Data Processing:***

* The application should be able to process weather data from RapidAPI into a format that is suitable for display.
* The application should be able to convert weather data into different units of measurement.
* The application should be able to filter and sort weather data based on user preferences.

### **3.2 Flowchart**

User Input

B [Validate Input]

A [Enter a city or Location]

B-> if valid

C {Retrive Weather data}

B-> if invalid

C {Display error message}

### 

### **3.3 Code**

#### ***HTML:***

<!doctype html>

<html lang="en">

<head>

  <meta charset="utf-8">

  <meta name="viewport" content="width=device-width, initial-scale=1">

  <title>Weather Forecast</title>

  <link href="https://cdn.jsdelivr.net/npm/bootstrap@5.3.2/dist/css/bootstrap.min.css" rel="stylesheet"

    integrity="sha384-T3c6CoIi6uLrA9TneNEoa7RxnatzjcDSCmG1MXxSR1GAsXEV/Dwwykc2MPK8M2HN" crossorigin="anonymous">

</head>

<body>

  <nav class="navbar navbar-expand-lg bg-body-tertiary">

    <div class="container-fluid">

      <a class="navbar-brand" href="#">Wearher Forecast</a>

      <button class="navbar-toggler" type="button" data-bs-toggle="collapse" data-bs-target="#navbarSupportedContent"

        aria-controls="navbarSupportedContent" aria-expanded="false" aria-label="Toggle navigation">

        <span class="navbar-toggler-icon"></span>

      </button>

      <div class="collapse navbar-collapse" id="navbarSupportedContent">

        <ul class="navbar-nav me-auto mb-2 mb-lg-0">

          <li class="nav-item">

            <a class="nav-link active" aria-current="page" href="#">Home</a>

          </li>

          <li class="nav-item">

            <a class="nav-link" href="#">About</a>

          </li>

          <li class="nav-item dropdown">

            <a class="nav-link dropdown-toggle" href="#" role="button" data-bs-toggle="dropdown" aria-expanded="false">

              How to use

            </a>

            <ul class="dropdown-menu">

              <li><a class="dropdown-item" href="#">Tripura</a></li>

              <li><a class="dropdown-item" href="#">Agartala</a></li>

              <li>

                <hr class="dropdown-divider">

              </li>

              <li><a class="dropdown-item" href="#">Something else here</a></li>

            </ul>

          </li>

        </ul>

        <form class="d-flex" role="search">

          <input id="city" class="form-control me-2" type="search" placeholder="Search" aria-label="Search">

          <button class="btn btn-outline-success" type="submit" id="submit">Search</button>

        </form>

      </div>

    </div>

  </nav>

  <div class="container">

    <div class="container py-3">

      <header>

        <div class="d-flex flex-column flex-md-row align-items-center pb-3 mb-4 border-bottom">

          <a href="/" class="d-flex align-items-center link-body-emphasis text-decoration-none">

            <svg xmlns="http://www.w3.org/2000/svg" width="16" height="16" fill="currentColor" class="bi bi-sun"

              viewBox="0 0 16 16">

              <path

                d="M8 11a3 3 0 1 1 0-6 3 3 0 0 1 0 6zm0 1a4 4 0 1 0 0-8 4 4 0 0 0 0 8zM8 0a.5.5 0 0 1 .5.5v2a.5.5 0 0 1-1 0v-2A.5.5 0 0 1 8 0zm0 13a.5.5 0 0 1 .5.5v2a.5.5 0 0 1-1 0v-2A.5.5 0 0 1 8 13zm8-5a.5.5 0 0 1-.5.5h-2a.5.5 0 0 1 0-1h2a.5.5 0 0 1 .5.5zM3 8a.5.5 0 0 1-.5.5h-2a.5.5 0 0 1 0-1h2A.5.5 0 0 1 3 8zm10.657-5.657a.5.5 0 0 1 0 .707l-1.414 1.415a.5.5 0 1 1-.707-.708l1.414-1.414a.5.5 0 0 1 .707 0zm-9.193 9.193a.5.5 0 0 1 0 .707L3.05 13.657a.5.5 0 0 1-.707-.707l1.414-1.414a.5.5 0 0 1 .707 0zm9.193 2.121a.5.5 0 0 1-.707 0l-1.414-1.414a.5.5 0 0 1 .707-.707l1.414 1.414a.5.5 0 0 1 0 .707zM4.464 4.465a.5.5 0 0 1-.707 0L2.343 3.05a.5.5 0 1 1 .707-.707l1.414 1.414a.5.5 0 0 1 0 .708z" />

            </svg>

            <span class="fs-4">Weather</span>

          </a>

          <nav class="d-inline-flex mt-2 mt-md-0 ms-md-auto">

            <a class="me-3 py-2 link-body-emphasis text-decoration-none" href="#">Features</a>

            <a class="me-3 py-2 link-body-emphasis text-decoration-none" href="#">Locations</a>

            <a class="me-3 py-2 link-body-emphasis text-decoration-none" href="#">Support</a>

        </div>

        <div class="pricing-header p-3 pb-md-4 mx-auto text-center">

          <h1 class="display-4 fw-normal text-body-emphasis">Weather</h1>

          <p class="fs-5 text-body-secondary"></p>

        </div>

      </header>

      <main>

        <div class="text-center">

          <div class="col">

            <div class="card mb-4 rounded-3 shadow-sm border-primary">

              <div class="card-header py-3 text-bg-primary border-primary">

                <h5 class="my-0 fw-normal">Weather of<span id="cityName"></span></h5>

              </div>

              <div class="card-body">

                <h1 class="card-title Temperature-card-title"><span id="temp"></span><span>&#8451;</span></h1>

                <ul class="list-unstyled mt-3 mb-4">

                  <li>Humidity: <span id="humidity"></span></li>

                  <li>Precipitation: <span id="cloud\_pct"></span></li>

                  <li>Wind: <span id="wind\_speed"></span></li>

                </ul>

              </div>

            </div>

          </div>

        </div>

        <h2 class="display-6 text-center mb-4">Wearher of Common places</h2>

        <div class="table-responsive">

          <table class="table text-center">

            <thead>

              <tr>

                <th style="width: 34%;"></th>

                <th style="width: 22%;">Temperature</th>

                <th style="width: 22%;">Humidity</th>

                <th style="width: 22%;">Precipitation</th>

                <th style="width: 22%;">wind speed</th>

              </tr>

            </thead>

            <tbody>

              <tr>

                <th scope="row" class="text-start"><span id="city"></span></th>

                <td><span id="temp"></span><span>&#8451;</span></td>

                <td><span id="humidity"></span></td>

                <td><span id="cloud\_pct"></span></td>

                <td><span id="wind\_speed"></span></td>

                <td><svg class="bi" width="24" height="24">

                    <use xlink:href="#check"></use>

                  </svg></td>

                <td><svg class="bi" width="24" height="24">

                    <use xlink:href="#check"></use>

                  </svg></td>

                <td><svg class="bi" width="24" height="24">

                    <use xlink:href="#check"></use>

                  </svg></td>

              </tr>

            <tbody>

          </table>

        </div>

      </main>

      <footer class="pt-4 my-md-5 pt-md-5 border-top">

        <div class="row">

          <div class="col-12 col-md">

          </div>

          <div class="col-6 col-md">

            <h5>Features</h5>

            <ul class="list-unstyled text-small">

              <li class="mb-1"><a class="link-secondary text-decoration-none" href="#">Random feature</a></li>

              <li class="mb-1"><a class="link-secondary text-decoration-none" href="#">Team feature</a></li>

            </ul>

          </div>

          <div class="col-6 col-md">

            <h5>Resources</h5>

            <ul class="list-unstyled text-small">

              <li class="mb-1"><a class="link-secondary text-decoration-none" href="#">Resource</a></li>

              <li class="mb-1"><a class="link-secondary text-decoration-none" href="#">Resource name</a></li>

              <li class="mb-1"><a class="link-secondary text-decoration-none" href="#">Final resource</a></li>

            </ul>

          </div>

          <div class="col-6 col-md">

            <h5>About</h5>

            <ul class="list-unstyled text-small">

              <li class="mb-1"><a class="link-secondary text-decoration-none" href="#">Team</a></li>

              <li class="mb-1"><a class="link-secondary text-decoration-none" href="#">Locations</a></li>

              <li class="mb-1"><a class="link-secondary text-decoration-none" href="#">Privacy</a></li>

              <li class="mb-1"><a class="link-secondary text-decoration-none" href="#">Terms</a></li>

            </ul>

          </div>

        </div>

      </footer>

    </div>

  </div>

  <script src="https://cdn.jsdelivr.net/npm/bootstrap@5.3.2/dist/js/bootstrap.bundle.min.js"

    integrity="sha384-C6RzsynM9kWDrMNeT87bh95OGNyZPhcTNXj1NW7RuBCsyN/o0jlpcV8Qyq46cDfL"

    crossorigin="anonymous"></script>

  <script src="https://code.jquery.com/jquery-3.6.4.min.js"></script>

  <script src="script.js"></script>

</body>

</html>

#### ***Javascript:***

const url = 'https://weather-by-api-ninjas.p.rapidapi.com/v1/weather?city=Seattle';

const options = {

  method: 'GET',

  headers: {

    'X-RapidAPI-Key': '26cc1b0a71mshb503fea2aeedb25p122b05jsnc916465ec9b1',

    'X-RapidAPI-Host': 'weather-by-api-ninjas.p.rapidapi.com'

  }

};

const getWeather = (city) => {

  cityName.innerHTML = city

  fetch('https://weather-by-api-ninjas.p.rapidapi.com/v1/weather?city=' + city, options)

    .then(Response => Response.json)

    .then((Response) =>

      console.log(Response))

  temp.innerHTML = Response.temp

  humidity.innerHTML = Response.humidity

  wind\_speed.innerHTML = Response.wind\_speed

  cloud\_pct.innerHTML = Response.cloud\_pct

    .catch(err => console.error(err));

}

submit.addEventListner("click", (e) => {

  console.log(submit);

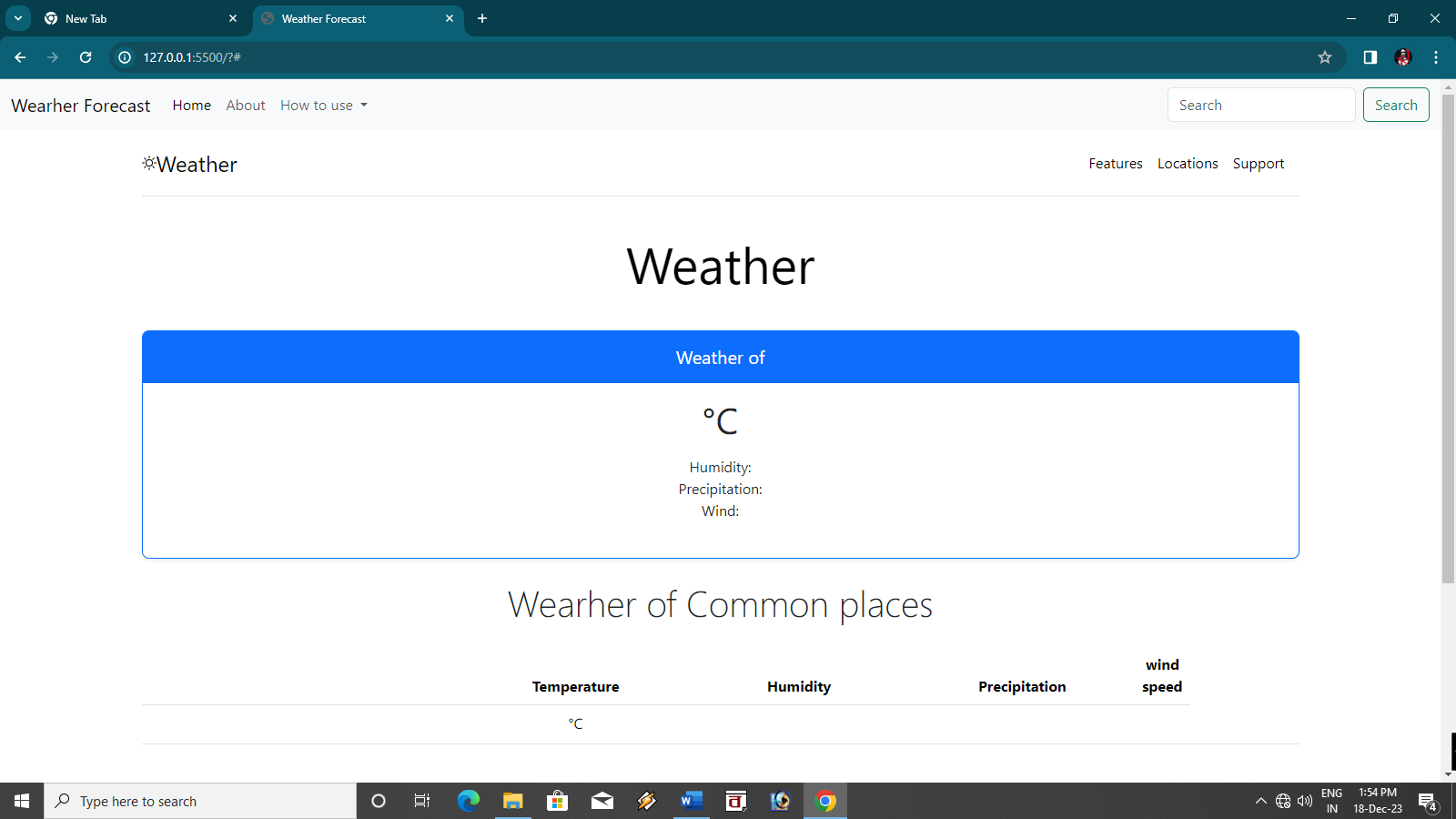
  e.preventDefault();

  getWeather(city.value);

});

getWeather("agartala")

## **Result/Output**



## **Conclusion**

The weather forecast application developed using HTML, CSS, and JavaScript effectively provides real-time weather information for users. The application is easy to use, visually appealing, and accessible on various devices. It utilizes Rapid API to fetch weather data from a reliable source, ensuring the accuracy and timeliness of the information presented.

The application's ability to display current weather conditions, forecasts for multiple days, and additional weather information makes it a valuable tool for planning daily activities and staying informed about potential weather changes. The customization options allow users to personalize their experience by selecting their preferred weather parameters, units of measurement, and location.

## **Reference**

* www.quabr.com/62184525/how-to-replace-output-properly
* github.com/aremanzh/SimpleWeatherStatus
* https://youtu.be/pFvWwFua6mw?si=8e0KOgcUpEyaFwOR

## 

## **Appendices**