Introduction to weather app:-

Our weather app, your go-to companion for all things weather-related, whether you're planning a weekend get away, preparing for your daily commute or simply curious about the current conditions our app has got you covered.

key features:-

1. Real-Time weather updates:- Stay up-to-date with the latest weather conditions for your location. our app provides real-time data. So you can trust that the information you receive is accurate and reliable.

2. Hourly and Daily forecasts:- Plan your day effectively with our detailed hourly hour and daily forecasts. know when to expects rain, sunshine, or any other weather changes and be prepared for any outdoor activities.

3. weather Alerts:- Receive timely weather alerts and warnings, ensuring you are aware to any potential hazards or adverse conditions. safety is our priority and our app will notify you at signification weather changes in your area.

4. customized locations:- Add multiple locations and access weather information for different cities or places that matter to you. whether its your home town vacation destination or a loved one's location, you can easily switch between locations.

Purpose :-

The purpose of weather app is to provide users with accurate and real-time weather information for any location they are interested in weather apps server several essential functions including.

1. weather forecasting :- The primary purpose of a weather app is to deliver weather forecasts, which help users plan their activities and make informed decisions based on expected weather conditions for the day or week ahead.

2. Real-Time updates :- whether app after real time updates on the current weather conditions, such as temperature, humidity, wind speed, and precipitation. allowing user to stay informed about the weather at their current location or any other location they are interested in.

3. servere weather Alerts :- weather apps can spend send alerts and warnings about severe weather events. such as storms - hurricanes, tornadoes our extreme.

4. Travel planning :- For travellers, a weather app is a valuable tool for checking weather conditions at their destination or along their travel route enabling them to pack appropriately and anticipate any potential weather-related disruptions.

Literature survey of weather app:-

1, Usability and user experience of weather app:-
Many studies focused on evaluation the usability and user experience of weather apps on different platforms. These assesments considered factors like app design. information presentation, and user interactions.
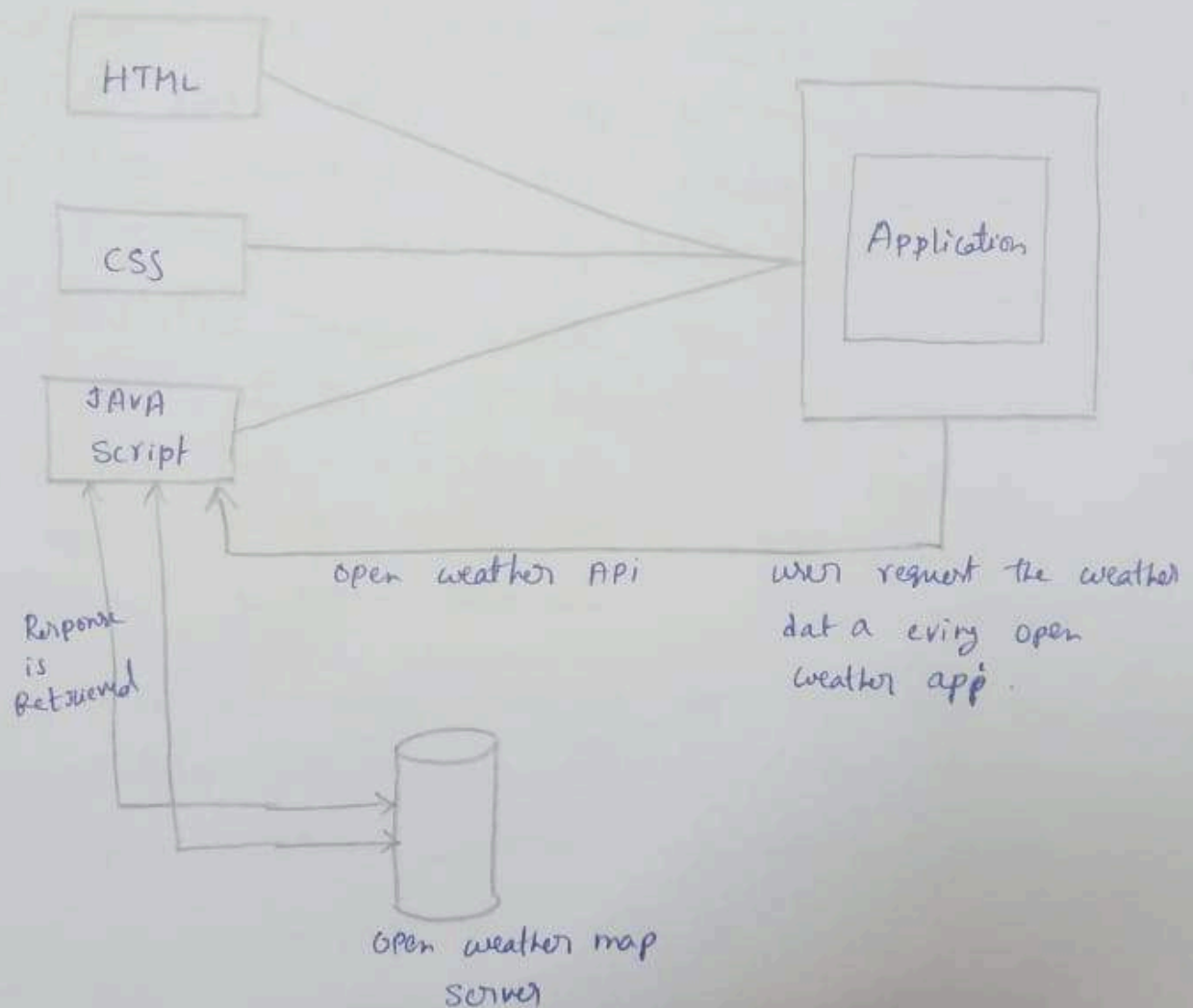
2, Accuracy and Reliability of weather app:
several research papers enamined the accuracy and reliability of weather app data Provided by various weather apps. These studies compared forecasts accracy between different apps and analyzed the sources of forecast data.

3, Data Visualization Techniques:- Researchers explored different data visualization methods and techniques to present weather information effectively. These studies aimed to improve user's comprehension of complex weather data through innovative visualization.

Block diagram:-

HTML

CSS

JAVA
Script

Application

open weather API

Response
is
Retrieved

user request the weather
data eviry open
weather app.

Open weather map
server

Software components :-

1. Application code :- The core of a weather app is its application code. This code is written in Programming languages like html, css, Java script depending on the platform and the frame work used for app development.

2. APIS :- weather apps reply on APIs Provided by weather data Providers and weather services.
These API's allow the app to access up-to data weather information including current conditions. and weather forecasts for specific locations.

3. Geolocation services:- weather apps often use geolocation services to determine the user's current location. This information is then used to Provider location-based weather forecasts and current weather conditions.

4. Push Notifications:- weather app can send Push notifications to users, alternating them about serve weather conditions or important updates.

Hardware components :-

1, smart phones, Tablets & computers:

weather apps primarily run on user devices. Such as smart phones, tablets & computers. These device Provide the platform on which the weather app software is installed and executed.

2, Sensors :- Some modern smart phones and Tablets come equipped with built-in-sensors that collects weather-related data. These may include GPs, barometers, thermometer, hygrometer and ambient light sensors, among other. They help gather location specific and environmental data to provides accurate weather information.

3, IOT Devices:- Internet to things devices. Such as smart weather station and weather sensors can do integrated with weather apps to Provide hyper local weather apps to provide hyper local weather data. These devices are often installed in homes on outdoor locations. collecting data that enchances the app's accuracy for specific regions.

Advantages:-

The advantages app not a weather app refers to the unique features and benifits that set it a part from other weather applications. Here are some potential advantages that a weather app could offer.

1, Accurate forecasting:- The app could utilizes advanced weather predictions models. Real-time data from reliable source. and cutting-edge technology to provide particularly valuble for users who need to plan outdoor activities or make travel arrangements with confidence.

2, localized weather updates:- The app may offer hyper local weather updates allowing user to get weather information specific to their exact location. This level of details can be crucial for people living in large cities with varying microclimates or those in remote areas.

3, user friendly interface:- A well-designed and interface can enhance the user experience. The app might present weather information in a clear and easily understandable format.

Disadvantages:-
        Weather app also come with some disadvantages
here are some potential drawbacks of using weather
app.

1. Inaccuracy:- while many weather apps strive to be
accurate. weather prediction is inherently challenging
and there can still be errors in forecasts.
User many reply heavily on the app's information
and make plans based on it. only to
encounter unexpected weather conditions.

2. Data source Reliability:- weather apps depend on
data from various Sources - including meterological
agncies and weather stations. The reliability
and accuracy of the app can be affected
if the data source experiences technical
issues or inconsistencies.

3, Battery drain:- weather apps often required
locations services and frequency data updates
which can consume and frequency. data
updates significant battery power.

Applications:-

A weather app is a versatile tool that can be applied in various situations and settings. Its primary purpose is to provide users with up-to data weather information for a specific location or multiple location. Here are some common application of weather apps.

1. Daily Forecast:- The most common use of weather app is to check the daily weather forecast for your current locations or likely place you plan to visit. Carry on umbrella or plan outdoor activities.

2. Travel planning:- weather apps are handy when planning a trip or vacation. They allow you to check the weather conditions of your destinations in advance helping you pack the right clothing and make any necessary adjustment to your intineracy.

3. outdoor Activities:- weather you're going for a hike. a picnic or a day at the beach. a weather app can help you decide on the best time to go based on the weather conditions. It can also provide information outdoor photography enthusiasts.

conclusion:-

The weather app is a web application that provides real time weather information to user by integrating the open weather map API easily weather data for a specific location. The projects modular structure allow for easy maintance and further enhancements such as adding additional features or optimizing the UI.

1, safety and preparedness:- weather apps offer server weather alerts, notifying users of potential hazards like help user take necessary precautions and stay safe during adverse weather conditions.

2, Environmental awareness:- some weather apps incorpurate environmental data, such as air quality and ur index, promoting awareness of environmental factors that can affect health and well being.

Future scope of weather App:-

The weather app landscape was already well-established, with numerous weather apps available on various platforms. Such as smart phones, tablets, and computers. However, technology and user needs evolve rapidly. Some potential future scope and enhancements for weather apps.

(i) Hyperlocal and Real-Time Data:- Future weather apps could provide even more granular, hyperlocal weather information with real-time updates. This could be achieved through the use of more advanced weather sensors. IoT devices and crowd-sourced data from user's smartphones.

(ii) Personalization and AI-Driven Insights:- weather apps could become more personalized by learning from users preferences and behaviour patterns. Advanced data to provide personalized weather forecasts and relevant insights such as weather-related health advisors.

File | C:/Users/User/Documents/weatherapp/index.html?

Search for a city...

°C °F

Goa

7/31/2023, 3:35:32 PM

overcast clouds

26°C

Min: 26°C   Max: 26°C

31°C
Cloudy

Search

ENG
US

3:35 PM
31/07/2023

```html
<!DOCTYPE html>
<html lang="en">
<head>
    <meta charset="UTF-8">
    <meta http-equiv="X-UA-Compatible" content="IE=edge">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <title>Weather.io</title>
    <link rel="stylesheet" href="./style.css">
</head>
<body>
    <div class="container">
      <div class="weather__header">
        <form class="weather__search">
          <input type="text" placeholder="Search for a city..." class="weather__searchform">
          <i class="fa-solid fa-magnifying-glass"></i>
        </form>
        <div class="loc weather__location-btn"><i class="fa-solid fa-location"></i></div>
        <div class="weather__units">
          <span class="weather_unit_celsius">&#176C</span>
          <span class="weather_unit_farenheit">&#176F</span>
        </div>
      </div>
      <div class="weather__body">
        <h1 class="weather__city"></h1>
        <div class="weather__datetime">
        </div>
        <div class="weather__forecast"></div>
        <div class="weather__icon">
        </div>
        <p class="weather__temperature">
        </p>
        <div class="weather__minmax">
          <p>Min: 12&#176</p>
          <p>Max: 16&#176</p>
        </div>
      </div>

      <div class="weather__info">
        <div class="weather__card">
          <i class="fa-solid fa-temperature-full"></i>
          <div>
            <p>Feels like</p>
            <p class="weather__realfeel">18&#176</p>
          </div>
        </div>
        <div class="weather__card">
          <i class="fa-solid fa-droplet"></i>
          <div>
            <p>Humidity</p>
            <p class="weather__humidity">18&#176</p>
          </div>
        </div>
        <div class="weather__card">
          <i class="fa-solid fa-wind"></i>
          <div>
            <p>Wind</p>
            <p class="weather__wind">18&#176</p>
          </div>
        </div>
        <div class="weather__card">
          <i class="fa-solid fa-gauge-high"></i>
          <div>
            <p>Pressure</p>
            <p class="weather__pressure">18&#176</p>
          </div>
        </div>
      </div>
    </div>
    <script src="https://kit.fontawesome.com/a692e1c39f.js" crossorigin="anonymous"></script>
    <script src="./script.js"></script>

</body>
</html>
```

```javascript
const cityElement = document.querySelector(".weather__city");
const datetimeElement = document.querySelector(".weather__datetime");
const forecastElement = document.querySelector(".weather__forecast");
const iconElement = document.querySelector(".weather__icon");
const temperatureElement = document.querySelector(".weather__temperature");
const minMaxElement = document.querySelector(".weather__minmax");
const realFeelElement = document.querySelector(".weather__realfeel");
const humidityElement = document.querySelector(".weather__humidity");
const windElement = document.querySelector(".weather__wind");
const pressureElement = document.querySelector(".weather__pressure");
const searchForm = document.querySelector(".weather__search");
const searchInput = document.querySelector(".weather__searchform");
const locationBtn = document.querySelector(".weather__location-btn");
const celsiusUnit = document.querySelector(".weather_unit_celsius");
const fahrenheitUnit = document.querySelector(".weather_unit_farenheit");

const apiKey = "e9b258b833970b94a95b9403213f3b7c";
const baseUrl = "https://api.openweathermap.org/data/2.5/weather";
let units = "metric";

searchForm.addEventListener("submit", (e) => {
  e.preventDefault();
  const city = searchInput.value.trim();
  if (city !== "") {
    fetchWeatherData(city);
  }
  searchInput.value = "";
});

locationBtn.addEventListener("click", getCurrentLocationWeather);

function getCurrentLocationWeather() {
  if (navigator.geolocation) {
    navigator.geolocation.getCurrentPosition(
      (position) => {
        const latitude = position.coords.latitude;
        const longitude = position.coords.longitude;
        fetchWeatherByCoordinates(latitude, longitude);
      },
      (error) => {
        console.log(error.message);
      }
    );
  } else {
    console.log("Geolocation is not supported by this browser.");
  }
}

async function fetchWeatherByCoordinates(latitude, longitude) {
  try {
    const response = await fetch(
      `${baseUrl}?lat=${latitude}&lon=${longitude}&appid=${apiKey}&units=${units}`
    );
    if (!response.ok) {
      throw new Error("Weather data not available.");
    }
    const data = await response.json();
    updateWeatherInfo(data);
  } catch (error) {
    console.log(error);
  }
}

celsiusUnit.addEventListener("click", () => {
  if (units !== "metric") {
    units = "metric";
    fetchWeatherData(cityElement.textContent); // Update weather data with new unit
  }
});

fahrenheitUnit.addEventListener("click", () => {
  if (units !== "imperial") {
    units = "imperial";
    fetchWeatherData(cityElement.textContent); // Update weather data with new unit
  }
});
```

```javascript
async function fetchWeatherData(city) {
  try {
    const response = await fetch(
      `${baseUrl}?q=${city}&appid=${apiKey}&units=${units}`
    );
    if (!response.ok) {
      throw new Error("Weather data not available.");
    }
    const data = await response.json();
    updateWeatherInfo(data);
  } catch (error) {
    console.log(error);
  }
}

function updateWeatherInfo(data) {
  cityElement.textContent = data.name;
  datetimeElement.textContent = getCurrentTime();
  forecastElement.textContent = data.weather[0].description;
  iconElement.innerHTML = `<img src="http://openweathermap.org/img/wn/${data.weather[0].icon}.png" alt="Weather Icon">`;
  temperatureElement.innerHTML = `${Math.round(data.main.temp)}&#176;${
    units === "metric" ? "C" : "F"
  }`;
  minMaxElement.innerHTML = `<p>Min: ${Math.round(data.main.temp_min)}&#176;${
    units === "metric" ? "C" : "F"
  }</p><p>Max: ${Math.round(data.main.temp_max)}&#176;${
    units === "metric" ? "C" : "F"
  }</p>`;
  realFeelElement.innerHTML = `<p>${Math.round(data.main.feels_like)}&#176;${
    units === "metric" ? "C" : "F"
  }</p>`;
  humidityElement.textContent = `${data.main.humidity}%`;
  windElement.textContent = `${data.wind.speed} ${
    units === "imperial" ? "mph" : "m/s"
  }`;
  pressureElement.textContent = `${data.main.pressure} hPa`;
}

function getCurrentTime() {
  const date = new Date();
  return date.toLocaleString();
}

window.addEventListener("load", () => {
  fetchWeatherData("Hyderabad");
  datetimeElement.textContent = getCurrentTime();
});
```

```css
  margin-right: 0.5rem;
}

.weather__body {
  text-align: center;
  margin-top: 3rem;
}

.weather__datetime {
  margin-bottom: 2rem;
  font-size: 14px;
}

.weather__forecast {
  background: #1e1e1e;
  display: inline-block;
  padding: 0.5rem 1rem;
  border-radius: 30px;
  margin-bottom: 1rem;
}

.weather__temperature {
  font-size: 5rem;
}

.weather__minmax {
  display: flex;
  justify-content: center;
}

.weather__minmax p {
  font-size: 14px;
  margin: 0.5rem;
}

.weather__info {
  display: grid;
  grid-template-columns: repeat(2, 1fr);
  grid-gap: 1rem;
  margin-top: 3rem;
}

.weather__card {
  display: flex;
  align-items: center;
  background: #1e1e1e;
  padding: 1rem;
  color: #000000;
  border-radius: 10px;
  border: 1px solid rgba(255, 255, 255, 0.38);
  background: rgba(255, 255, 255, 0.21);
  backdrop-filter: blur(15px);
}

.weather__card i {
  font-size: 1.5rem;
  margin-right: 1rem;
}

.weather__card p {
  font-size: 14px;
}

@media (max-width: 936px) {
  .container {
    width: 90%;
  }

  .weather__header {
    flex-direction: column;
    gap: 1rem;
    flex-wrap: wrap;
  }

  .weather__units {
    margin-top: 1rem;
```

```css
    }
  }

  @media (max-width: 400px) {
    .weather__info {
      grid-template-columns: none;
    }
  }
```