**JSS MAHAVIDYAPEETHA**

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**Mini Project Assessment**

|  |
| --- |
| **Subject Name: Mini project / Internship Assessment**  **Subject Code : KCS-354** |

COURSE: B.Tech.

SEMESTER: Vth

**by**

**SHIVANSHU SAXENA**

**ROLL NO: 1900910100158**

**Department of Computer Science and Engineering**

**JSS ACADEMY OF TECHNICAL EDUCATION**

**VISION AND MISSION**

**VISION OF THE INSTITUTE**

**JSS** **A**cademy of **T**echnical **E**ducation Noida aims to become an Institution of excellence in imparting quality **O**utcome **B**ased **E**ducation that empowers the young generation with **K**nowledge, **S**kills, **R**esearch, **A**ptitude and **E**thical values to solve **Contemporary Challenging Problems.**

**MISSION OF THE INSTITUTE**

**D**evelop a platform for achieving globally acceptable level of intellectual acumen and technological competence

**C**reate an inspiring ambience that raises the motivation level for conducting quality research

**P**rovide an environment for acquiring ethical values and positive attitude

**VISION OF THE DEPARTMENT**

“To spark the imagination of the Computer Science Engineers with values, skills

and creativity to solve the real-world problems.”

**MISSION OF THE DEPARTMENT**

To inculcate creative thinking and problem-solving skills through effective teaching, learning and research.

To empower professionals with core competency in the field of Computer Science and Engineering.

To foster independent and lifelong learning with ethical and social responsibilities.

**PROGRAM OUTCOMES (POs)**

**Engineering Graduates will be able to:**

**PO1: Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

**PO2: Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

**PO3: Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

**PO4: Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

**PO5: Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

**PO6: The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

**PO7: Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

**PO8: Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

**PO9: Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

**PO10: Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

**PO11: Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one’s own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

**PO12: Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

**PROGRAM EDUCATIONAL OUTCOMES (PEOs)**

**PEO1**: To empower students with effective computational and problem-solving skills.

**PEO2:** To enable students with core skills for employment and entrepreneurship.

**PEO3**: To imbibe students with ethical values and leadership qualities.

**PEO4:** To foster students with research-oriented ability which helps them in analyzing and solving real life problems and motivate them for pursuing higher studies.

**PROGRAM SPECIFIC OUTCOMES (PSOs)**

PSO1: An ability to apply foundation of Computer Science and Engineering, algorithmic principles and theory in designing and modeling computation-based systems.

PSO2: The ability to demonstrate software development skills.

**COURSE OUTCOMES (COs)**

|  |  |
| --- | --- |
| **C224.1** | Undertake problem identification, formulation and design a solution |
| **C224.2** | Solve the real-world problems effectively and adapt with real life working environment. |
| **C224.3** | Acquire skills and knowledge on latest tools and technologies |
| **C224.4** | Develop effective communication skills for presentation of project related activities |
| **C224.5** | Effectively communicate solution to problems through technical reports |

**CO-PO-PSO MAPPING**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO 10** | **PO 11** | **PO 12** | **PSO1** | **PSO2** |
| **C224.1** | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 |
| **C224.2** | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 |
| **C224.3** | 2 | 2 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 1 | 2 | 3 | 3 | 3 |
| **C224.4** | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 2 | 3 | 2 | 2 |
| **C224.5** | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 2 | 3 | 2 | 2 |
| **C224** | 2.40 | 2.40 | 2.60 | 2.60 | 2.40 | 2.40 | 2.60 | 2.60 | 2.60 | 2.40 | 2.20 | 3.00 | 2.60 | 2.60 |

***DECLARATION***

*I hereby declare that this submission is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person nor material which to a substantial extent has been accepted for the award of any other degree or diploma of the university or other institute of higher learning, except where due acknowledgment has been made in the text.*

*Name : SHIVANSHU SAXENA*

*Roll No.: 1900910100158*

*Date* *: 12/12/2021*

***CERTIFICATE***

This is to certify that Mini Project/Internship Assessment Report entitled **“WEATHER-APP-MONITOR”** which is submitted by **SHIVANSHU SAXENA** in partial fulfillment of the requirement for the award of degree B. Tech. in Department of Computer Science and Engineering of Dr. APJ Abdul Kalam Technical University, Uttar Pradesh, Lucknow is a record of the candidate’s own work carried out by her under my supervision. The matter embodied in this report is original and has not been submitted for the award of any other degree.

**Supervisor – Mrs. Suruchi Sabherwal**

**Date – 10/12/2021**

***ACKNOWLEDGEMENT***

Presentation, inspiration and motivation have always played a key role in the success of any venture. I express my sincere thanks to Prof. G.M. Patil, Principal, J.S.S Academy of Technical Education, Noida.I pay my deep sense of gratitude to Prof. Rachna Jain to encourage me to the highest peak and to provide me the opportunity to prepare the project. I am immensely obliged to my friends for their elevating inspiration, encouraging guidance and kind supervision in the completion of my project. I feel to acknowledge my indebtedness and deep sense of gratitude to my teachers whose valuable guidance and kind supervision given to me throughout the course which shaped the present work as its show. Last, but not the least, my parents are also an inspiration for me. So, with my due regards, I express my gratitude towards them.

***Abstract***

Weather is the state of the atmosphere at a given place and time in regards to heat, cloudiness, dryness, sunshine, wind, and rain. Of all the geophysical phenomena, weather is the most significant one that influences us. Weather can vary greatly and largely depends on climate, seasons and various other factors. The chief goal of this work is to get the weather forecast of any city throughout the world through an application. In this project, we'll be building our very own weather application with HTML, CSS, and Vanilla JavaScript. To retrieve the data, we'll be using something called an [API](https://en.wikipedia.org/wiki/Application_programming_interface), or an application programming interface.

Our weather app will show the weather information that it will get from the API like OpenWeatherMap, an Icon that shows the weather status, the temperature value (18°C) in Celsius unit, the weather description (clear sky), and then the user's city and country (London, GB).When the user clicks on the temperature value, that will convert it from Celsius to Fahrenheit.

**TABLE OF CONTENTS:**

[1.](https://docs.google.com/document/d/1kSVD9HQOALWygR22-8i22MQuHacI5umK/edit#heading=h.oi9zmej9elzx) Acknowledgement 8

2[. Abstract](https://docs.google.com/document/d/1kSVD9HQOALWygR22-8i22MQuHacI5umK/edit#heading=h.655t708dk5j4)  9

3[.](https://docs.google.com/document/d/1kSVD9HQOALWygR22-8i22MQuHacI5umK/edit#heading=h.wfin4x9wnfn9) [I](https://docs.google.com/document/d/1kSVD9HQOALWygR22-8i22MQuHacI5umK/edit#heading=h.oi9zmej9elzx)ntroduction 11

4[.](https://docs.google.com/document/d/1kSVD9HQOALWygR22-8i22MQuHacI5umK/edit#heading=h.ez5vapxkz61) [Tools and technologies used](https://docs.google.com/document/d/1kSVD9HQOALWygR22-8i22MQuHacI5umK/edit#heading=h.655t708dk5j4) 16

5[.](https://docs.google.com/document/d/1kSVD9HQOALWygR22-8i22MQuHacI5umK/edit#heading=h.oi9zmej9elzx) History and Features of Technology 20

6. Work Done 25

7. Conclusion 29

**LIST OF FIGURES:**

[1.](https://docs.google.com/document/d/1w3vsmvdk84w1SP209pWAb_lioPbN5YIJOKq9UV1HTjs/edit#heading=h.30j0zll) Sample Output 12

2[.](https://docs.google.com/document/d/1w3vsmvdk84w1SP209pWAb_lioPbN5YIJOKq9UV1HTjs/edit#heading=h.1fob9te) Example Weather Website 15

3[.](https://docs.google.com/document/d/1w3vsmvdk84w1SP209pWAb_lioPbN5YIJOKq9UV1HTjs/edit#heading=h.3znysh7) Comparison Between Various Technologies 19

4[.](https://docs.google.com/document/d/1w3vsmvdk84w1SP209pWAb_lioPbN5YIJOKq9UV1HTjs/edit#heading=h.4d34og8) Weather Icons 25

5[.](https://docs.google.com/document/d/1w3vsmvdk84w1SP209pWAb_lioPbN5YIJOKq9UV1HTjs/edit#heading=h.2s8eyo1) Project Source Code 26-28

6[.](https://docs.google.com/document/d/1w3vsmvdk84w1SP209pWAb_lioPbN5YIJOKq9UV1HTjs/edit#heading=h.3znysh7) Diagrammatic Representation Of Project 29

**INTRODUCTION**

Weather app is the application of science and technology to predict the

conditions of the atmosphere for a given location and time. Human beings 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 at a given place and using meteorology to

project how the atmosphere will change.

Once a human-only endeavor based mainly upon changes in barometric pressure, current weather conditions, and sky condition or cloud cover, weather forecasting now relies on computer-based models that take many atmospheric factors into account. Human input is still required to pick the best possible forecast model to base the forecast upon, which involves pattern recognition skills, tele-connections, knowledge of model performance, and knowledge of model biases. The inaccuracy of forecasting is due to the chaotic nature of the atmosphere, the massive computational power required to solve the equations that describe the atmosphere, the error involved in measuring the initial conditions, and an incomplete understanding of atmospheric processes. Hence, forecasts become less accurate as the difference between current time and the time for which the forecast is being made (the range of the forecast) increases.

Temperature forecasts are used by utility companies to estimate demand over coming days. On an everyday basis, people use weather forecasts to determine what to wear on a given day. Since outdoor activities are severely curtailed by heavy rain, snow and wind chill, forecasts can be used to plan activities around these events, and to plan ahead and survive them.The purpose of developing the weather app is to fetch the data in the need of taking information about weather worldwide.

The scope of the project is the system on which the software is installed, i.e. the project is developed as a desktop application. Later on the project can be modified to operate it online. The intention of developing this weather app is to fetch the data in the need of taking information about weather worldwide.

No wonder, calling a server using an API is one of the coolest things a web-developer comes through in his path towards web-development. An API (Application Programming Interface) is a computing interface that defines interactions between multiple software intermediaries. Basically it helps us to retrieve raw data from the client-server.

So in this project, the HTML and CSS will serve the visuals to the user where we will see the results and the text area where the input will be taken. The weather web-app will display the city name, the country name, the weather of the city and the temperature in Celsius. Whereas the JavaScript part will be the heart of this project which will make a link to the client site, fetch the details using API keys, and will provide as well as display the necessary information for our project. When the user clicks on the temperature value, that will convert it from Celsius to Fahrenheit.

Well, we're actually going to use two APIs: one to get the location of the user and another to fetch weather data based on the user's location!

To retrieve a user's location, we'll be using the [Geolocation Web API](https://developer.mozilla.org/en-US/docs/Web/API/Geolocation/Using_geolocation) to auto-detect the user's latitude and longitude. Once we have this information, we can make a request to a weather source – like [OpenWeatherMap](https://openweathermap.org/) — to get weather data based on a user's location.

*Sample Output*  Text, whiteboard

Description automatically generated

[**API (application programming interface)**](https://rapidapi.com/blog/api-glossary/api/)**-** [An API (application programming interface)](https://rapidapi.com/blog/api-glossary/api/) is a form of pre-defined interaction between the [client](https://rapidapi.com/blog/api-glossary/client/) and the [service](https://rapidapi.com/blog/api-vs-web-service/).In other words, the client doesn’t need to bother about the inside structure of the responding side and vice versa.

The main advantage of using weather APIs includes full independence from:

* platforms
* OS
* programming languages
* technologies
* devices
* [geographical locations](https://rapidapi.com/blog/ip-geolocation/)
* and more!

Weather APIs allow us to:

* cooperate with powerful and enormous data storage,
* get historical weather records,
* access forecasts for any point on Earth.

### [**OpenWeatherMap**](https://rapidapi.com/community/api/open-weather-map) - - The Open Weather App API is free on a basic plan and high-precision API. Their weather database is huge. We can use diverse metrics (e.g., temperature, humidity, air pollution, wind speed and degree, clouds percentage). We can also get a simple forecast, daily forecast, historical weather data, or use a city search. Before getting into the application, let me tell you how I got the weather data. You might wonder how I could get weather data for cities all over the world. It is not a big deal as you think when we have APIs like [openweathermap](https://openweathermap.org/). I have used the openweathermap api to get weather data of cities all over the world.

We can do it by doing two simple steps.

1. Create an account in [openweathermap](https://openweathermap.org/)
2. Generate an api key.

Once I had that set up I was ready to get coding. I started out by building out my HTML. I didn’t get overly fancy with the architecture or design since the emphasis of the build would be on the Javascript. The original HTML markup had placeholder information in the temp and location div’s so I could see what I was styling but that was later removed since the app would be populating information for those divs on load. One thing I did inside of my HTML was, and I’m sure this is standard practice for everyone else, I went ahead and placed id’s to the elements I knew I would want to target later with my Javascript.

* User can view the weather in his/her current location.
* User can toggle the temperature unit (Celsius or Fahrenheit).
* Weather icon will change depending on weather conditions.

The easiest way to do this was to use the HTML5 Geolocation API which was pretty straightforward. My major takeaway from this project is that I learnt how to access each part of the returned JSON data from the API response and use it in different ways. Although my methodology needs some refining, it’s bound to get better with more practice.

**JSON** - JSON stands for **J**ava**S**cript **O**bject **N**otation, a lightweight, easily understandable format used for storing and transporting data.

1. Anything enclosed by curly braces({}) in json are called json objects
2. Anything enclosed by square braces([]) in json is called json array.

Graphical user interface

Description automatically generated

*An Example Weather Website*

**TOOLS AND TECHNOLOGY USED:**

Hereby, the project named as **Weather-App-Monitor** is built mainly using **Javascript**.

#### ***Used technologies :-***

* **HTML5 -** Hypertext Markup Language (HTML) is the standard [markup language](https://en.wikipedia.org/wiki/Markup_language) for documents designed to be displayed in a [web browser](https://en.wikipedia.org/wiki/Web_browser). It can be assisted by technologies such as [Cascading Style Sheets](https://en.wikipedia.org/wiki/Cascading_Style_Sheets) (CSS) and [scripting languages](https://en.wikipedia.org/wiki/Scripting_language) such as [JavaScript](https://en.wikipedia.org/wiki/JavaScript).

[Web browsers](https://en.wikipedia.org/wiki/Web_browser) receive HTML documents from a [web server](https://en.wikipedia.org/wiki/Web_server) or from local storage and [render](https://en.wikipedia.org/wiki/Browser_engine) the documents into multimedia web pages. HTML describes the structure of a [web page](https://en.wikipedia.org/wiki/Web_page) [semantically](https://en.wikipedia.org/wiki/Semantic_Web) and originally included cues for the appearance of the document.

[HTML elements](https://en.wikipedia.org/wiki/HTML_element) are the building blocks of HTML pages. With HTML constructs, [images](https://en.wikipedia.org/wiki/HTML_element#Images_and_objects) and other objects such as [interactive forms](https://en.wikipedia.org/wiki/Fieldset) may be embedded into the rendered page. HTML provides a means to create [structured documents](https://en.wikipedia.org/wiki/Structured_document) by denoting structural [semantics](https://en.wikipedia.org/wiki/Semantics) for text such as headings, paragraphs, lists, [links](https://en.wikipedia.org/wiki/Hyperlink), quotes and other items. HTML elements are delineated by *tags*, written using [angle brackets](https://en.wikipedia.org/wiki/Bracket#Angle_brackets).

HTML can embed programs written in a [scripting language](https://en.wikipedia.org/wiki/Scripting_language) such as [JavaScript](https://en.wikipedia.org/wiki/JavaScript), which affects the behavior and content of web pages. Inclusion of CSS defines the look and layout of content. The [World Wide Web Consortium](https://en.wikipedia.org/wiki/World_Wide_Web_Consortium) (W3C), former maintainer of the HTML and current maintainer of the CSS standards, has encouraged the use of CSS over explicit presentational HTML since 1997.

* **CSS3 -** Cascading Style Sheets, or CSS, are a way to change the look of [HTML](https://simple.wikipedia.org/wiki/HTML) and [XHTML](https://simple.wikipedia.org/wiki/XHTML) web pages. CSS was designed by the [W3C](https://simple.wikipedia.org/wiki/W3C), and is supported well by most modern [web browsers](https://simple.wikipedia.org/wiki/Web_browser). The current version of CSS is CSS3. CSS4 is available, but is split into parts.One advantage to using CSS is a web page can still be displayed, even if the CSS is not working or removed.

CSS code is saved in files with the .css file extension. Cascading Style Sheets (CSS) is a [style sheet language](https://en.wikipedia.org/wiki/Style_sheet_language) used for describing the [presentation](https://en.wikipedia.org/wiki/Presentation_semantics) of a document written in a [markup language](https://en.wikipedia.org/wiki/Markup_language) such as [HTML](https://en.wikipedia.org/wiki/HTML). CSS is a cornerstone technology of the [World Wide Web](https://en.wikipedia.org/wiki/World_Wide_Web), alongside HTML and [JavaScript](https://en.wikipedia.org/wiki/JavaScript).

CSS is designed to enable the separation of presentation and content, including [layout](https://en.wikipedia.org/wiki/Page_layout), [colors](https://en.wikipedia.org/wiki/Color), and [fonts](https://en.wikipedia.org/wiki/Typeface). This separation can improve content [accessibility](https://en.wikipedia.org/wiki/Accessibility), provide more flexibility and control in the specification of presentation characteristics, enable multiple [web pages](https://en.wikipedia.org/wiki/Web_page) to share formatting by specifying the relevant CSS in a separate .css file which reduces complexity and repetition in the structural content as well as enabling the .css file to be [cached](https://en.wikipedia.org/wiki/Cache_(computing)) to improve the page load speed between the pages that share the file and its formatting.

* **Vanilla Javascript -** This is an alphabetized glossary of terms pertaining to the programming language [JavaScript](https://en.wikipedia.org/wiki/JavaScript), along with their meanings in the context of that language. JavaScript is the programming language of the Web. It is one of the 3 core web development technologies (the other two being [HTML](https://en.wikipedia.org/wiki/HTML) and [CSS](https://en.wikipedia.org/wiki/CSS)), and it is used on most web pages. Note that JavaScript is not related to Java; they are two distinctly different programming languages. Communication about JavaScript is highly [jargonized](https://en.wikipedia.org/wiki/Jargon). The following entries should help in understanding reading material about JavaScript, and serve as search terms for exploring the subject further.

JS, is a [programming language](https://en.wikipedia.org/wiki/Programming_language) that conforms to the [ECMAScript](https://en.wikipedia.org/wiki/ECMAScript) specification.[[](https://en.wikipedia.org/wiki/JavaScript#cite_note-tc39-7) JavaScript is [high-level](https://en.wikipedia.org/wiki/High-level_programming_language), often [just-in-time compiled](https://en.wikipedia.org/wiki/Just-in-time_compilation), and [multi-paradigm](https://en.wikipedia.org/wiki/Programming_paradigm). It has [curly-bracket syntax](https://en.wikipedia.org/wiki/List_of_programming_languages_by_type#Curly-bracket_languages), [dynamic typing](https://en.wikipedia.org/wiki/Dynamic_typing), [prototype-based](https://en.wikipedia.org/wiki/Prototype-based_programming) [object-orientation](https://en.wikipedia.org/wiki/Object-oriented_programming), and [first-class functions](https://en.wikipedia.org/wiki/First-class_function).JavaScript engines were originally used only in web browsers, but they are now embedded in some [servers](https://en.wikipedia.org/wiki/Server_(computing)), usually via [Node.js](https://en.wikipedia.org/wiki/Node.js). They are also embedded in a variety of applications created with [frameworks](https://en.wikipedia.org/wiki/Software_framework) such as [Electron](https://en.wikipedia.org/wiki/Electron_(software_framework)) and [Cordova](https://en.wikipedia.org/wiki/Apache_Cordova).

* **OpenWeatherMap -** OpenWeatherMap is an online service, owned by OpenWeather Ltd, that provides global [weather](https://en.wikipedia.org/wiki/Weather) data, including current weather data, [forecasts](https://en.wikipedia.org/wiki/Weather_forecasting), [nowcasts](https://en.wikipedia.org/wiki/Nowcasting_(meteorology)) and historical data (starting from 1979), utilising meteorological broadcast services and raw data from [airport](https://en.wikipedia.org/wiki/Airport) [weather stations](https://en.wikipedia.org/wiki/Weather_station), radar stations and other weather stations. It provides more than twenty weather [APIs](https://en.wikipedia.org/wiki/Application_programming_interface), with almost 7000 repositories on [GitHub](https://en.wikipedia.org/wiki/GitHub). The APIs support multiple languages, [units of measurement](https://en.wikipedia.org/wiki/Unit_of_measurement) and data formats.

The platform uses OpenStreetMap to display [weather maps](https://en.wikipedia.org/wiki/Weather_map), and it provides many of its services free of charge. But despite the name of the platform, it is not open to user contributions, and most of their services require paid subscriptions. The OpenWeatherMap service provides a Current Weather API, along with several types of forecasts with different depths and measurement steps:

* Minute Forecast – for 1 hour
* Hourly Forecast – for 4 days
* 3-hour Step Forecast – for 5 days
* Daily Forecast – for 16 days
* Climate Forecast – for 30 days

Alternative technologies could have been also used for creating a weather app such as Django, nodejs, Reactjs, flask etc and many more…..

* **JSON(Javascript Object Notation) -** Javascript Object Notationis an [open standard](https://en.wikipedia.org/wiki/Open_standard) [file format](https://en.wikipedia.org/wiki/File_format), and data interchange format, that uses [human-readable](https://en.wikipedia.org/wiki/Human-readable_medium) text to store and transmit data objects consisting of [attribute–value pairs](https://en.wikipedia.org/wiki/Attribute%E2%80%93value_pair) and [array data types](https://en.wikipedia.org/wiki/Array_data_type) (or any other [serializable](https://en.wikipedia.org/wiki/Serialization) value). It is a very common [data](https://en.wikipedia.org/wiki/Data) format, with a diverse range of applications, such as serving as a replacement for [XML](https://en.wikipedia.org/wiki/XML) in [AJAX](https://en.wikipedia.org/wiki/Ajax_(programming)) systems.

JSON is a [language-independent](https://en.wikipedia.org/wiki/Language-independent_specification) data format. It was derived from [JavaScript](https://en.wikipedia.org/wiki/JavaScript), but many modern [programming languages](https://en.wikipedia.org/wiki/Programming_language) include code to generate and [parse](https://en.wikipedia.org/wiki/Parsing) JSON-format data. The official Internet [media type](https://en.wikipedia.org/wiki/Media_type) for JSON is application/json. JSON filename uses the extension .json.

### *MIME type[*[*edit*](https://en.wikipedia.org/w/index.php?title=JSON&action=edit&section=7)*]*

The official [MIME type](https://en.wikipedia.org/wiki/MIME_type) for JSON text is "application/json" and most modern implementations have adopted this.

The unofficial MIME type "text/json" or the content-type "text/javascript" also get legacy support by many service providers, browsers, servers, web applications, libraries, frameworks, and APIs. Notable examples include the Google Search API,Yahoo!, Flickr, Facebook API, [Lift framework](https://en.wikipedia.org/wiki/Lift_(web_framework)), Dojo Toolkit 0.4, etc.

### *JSON Schema[*[*edit*](https://en.wikipedia.org/w/index.php?title=JSON&action=edit&section=8)*]*

JSON Schema specifies a JSON-based format to define the structure of JSON data for validation, documentation, and interaction control. It provides a contract for the JSON data required by a given application, and how that data can be modified.

JSON Schema is based on the concepts from [XML Schema](https://en.wikipedia.org/wiki/XML_Schema_(W3C)) (XSD), but is JSON-based. As in XSD, the same serialization/deserialization tools can be used both for the schema and data; and is self-describing. It is specified in an [Internet Draft](https://en.wikipedia.org/wiki/Internet_Draft) at the IETF, currently in 2019-09 draft, which was released on September 19, 2019. There are several validators available for different programming languages,each with varying levels of conformance. There is no standard filename extension, but some have suggested .schema.json

* **AJAX(Asynchronous JavaScript and XML) -** AJAX is a set of [web development](https://en.wikipedia.org/wiki/Web_development) techniques using many web technologies on the [client side](https://en.wikipedia.org/wiki/Client_side) to create [asynchronous](https://en.wikipedia.org/wiki/Asynchronous_I/O) [web applications](https://en.wikipedia.org/wiki/Web_application). With Ajax, web applications can send and retrieve data from a [server](https://en.wikipedia.org/wiki/Web_server) asynchronously (in the background) without interfering with the display and behaviour of the existing page. By decoupling the data interchange layer from the presentation layer, Ajax allows web pages and, by extension, web applications, to change content dynamically without the need to reload the entire page. In practice, modern implementations commonly utilize [JSON](https://en.wikipedia.org/wiki/JSON) instead of XML.

Ajax is not a single technology, but rather a group of technologies. [HTML](https://en.wikipedia.org/wiki/Hypertext_Markup_Language) and [CSS](https://en.wikipedia.org/wiki/Cascading_Style_Sheets) can be used in combination to mark up and style information. The webpage can then be modified by JavaScript to dynamically display—and allow the user to interact with—the new information. The built-in [XMLHttpRequest](https://en.wikipedia.org/wiki/XMLHttpRequest) object, or since 2017 the new "fetch()" function within JavaScript, is commonly used to execute Ajax on webpages, allowing websites to load content onto the screen without refreshing the page. Ajax is not a new technology, or different language, just existing technologies used in new ways.

**** *Comparison Of Technologies*

**HISTORY AND FEATURES OF TECHNOLOGY**

**JavaScript Origins**

JavaScript is everywhere, and for the seventh year in a row, it has been ranked [the most commonly used programming language](https://fossbytes.com/javascript-most-popular-programming-language-stack-overflow/), with 67.8% of developers employing it in 2019. Its ascent to the world’s most popular programming language is synonymous with the rise of the internet itself.

The early to mid-1990s was an important time for the internet. Key players like Netscape and Microsoft were in the midst of browser wars, with Netscape’s Navigator and Microsoft’s Internet Explorer going head to head.

In September 1995, a Netscape [programmer](https://www.springboard.com/blog/programmer-portfolio/) named [Brandan Eich](https://en.wikipedia.org/wiki/Brendan_Eich) developed a new scripting language in just 10 days. It was originally named Mocha, but quickly became known as LiveScript and, later, JavaScript.

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## **ECMAScript Is Born**

In 1997, due to JavaScript’s rapid growth, it became clear that the language would need to be properly maintained and managed. Therefore, Netscape handed the job of creating a language specification to the European Computer Manufacturers Association (ECMA), a body founded with the goal of standardizing computing. The ECMA specifications were labeled ECMA-262 and ECMAScript languages included JavaScript, JScript, and ActionScript.

Between 1997 and 1999, ECMA-262 had three revisions, but nearly 10 years later, version 4 was abandoned due to differing opinions on the direction of the language and its proposed features. Interestingly, many of these controversial features, such as generators, iterators, and destructuring assignments, have been included in more recent ECMAScript specifications.

**The Paper That Started a Movement -**

The year 2005 proved to be a big one for JavaScript. A paper released by Jesse James Garrett introduced Ajax, a revolutionary suite of technologies that included JavaScript. Ajax vastly improved user experience by allowing web pages to feel more like native desktop apps. This really pushed JavaScript into the spotlight as a professional programming language.

This paper is considered to be one of the founding backbones of the JavaScript community. At the time, JavaScript had many challenges, including its verbose nature when doing simple things and the incompatibility issues between browsers. The community responded with large and popular JavaScript frameworks and libraries, such as Dojo and Mootools and jQuery.

**FEATURES OF JAVASCRIPT -**

**JavaScript is divided into two main features, they are as follows –**

### **General JavaScript Features**

JavaScript language consists of several different features. Some of the general JavaScript features are as follows –

#### **1. Validating User’s Input**

JavaScript is very useful while using forms. It has the capability to validate user input for errors and also saves time. If the user leaves a required field empty or the information is incorrect, JavaScript checks for them before sending the data over to the server.

#### **2. Simple Client-side Calculations**

Since JavaScript is a client-side technology, it can perform basic calculations on the browser. The browser does not need to ask server time for every task. This is especially helpful when a user needs to perform these calculations repeatedly. In these cases, connecting to the server would take a lot more time than performing the actual calculations.

#### **3. Greater Control**

JavaScript provides greater control to the browser rather than being completely dependent on the web servers. JavaScript provides various browsers with additional functionalities that help reduce server load and network traffic.

#### **4. Platform Independent**

Since browsers interpret JavaScript, it solves the problem of compilation and compatibility. Thus it can run on Windows, Macintosh, and other Netscape-supported systems. Also, it is possible to embed them in any other script like [HTML](https://en.wikipedia.org/wiki/HTML) that keeps JavaScript into use.

#### **5. Handling Dates and Time**

Unlike other programming languages, JavaScript has built-in functions to determine the date and time. Thus it is very easy to code only by using methods like .getDate().

#### **6. Generating HTML Content**

JavaScript has very handy features to dynamically generate HTML content for the web. It allows us to add text, links, images, tables, etc after an event occurrence (eg – mouse click).

#### **7. Detecting the User’s Browser and OS**

JavaScript is very capable in the detection of the user’s browser and OS information. Though JavaScript runs on every platform, there may occur a situation where we need the user’s browser before processing. This can be helpful for writing code that results in different outputs in different browsers.

**Modern JavaScript Features**

If we dive into some more recently added features of JavaScript that makes it unique from other programming languages. There are a lot more modern features of JavaScript invented after some general features. Some of them are as follows –

**1. Let/Const**

JavaScript has introduced the keywords ‘let’ and ‘const’ that are available to replace ‘var’. Unlike ‘var’, they are important due to their blocked scope i.e we can only access them in the block we defined them in. Whereas ‘var’, even if we initialize it inside a function, we can access it outside of the function.

**2. Arrow Functions**

These functions are very useful in simplifying the syntax and tamp down the lines of codes for the web page or web application. Since these are light-weight in syntax, they can be very easily used in anonymous functions in JavaScript.

**3. Template Literal**

This is a common feature in other programming languages that allows you to save variables directly into strings. This proves to be an important tool for developers as it permits them to focus more on the development of the application rather than spending the time on syntax.

**4. New Array Functions**

Though array functions are not necessary for any programming language, they do simplify things for the developer. This also compacts the code and makes it much easier to understand. A regular array and an associative array, JavaScript supports them both. While a regular array contains integer values for its index, indexes can be strings for an associative array.

#### **5. Default Parameters**

This JavaScript feature helps to avoid collapsing the whole code for a simple mistake. It is very useful when the developer needs to check the working of a function without any parameters.

#### **6. Property Shorthand**

Built-in methods like .get() are available for the developer’s use. These methods help avoid writing the same code every time and cut back on various lines of code. These inborn methods are really supportive of cutting back the developing time and cost.

**WORK DONE**

A **WEB BASED   WEATHER MONITOR** is an automated version of the traditional weather station. There are plenty of weather apps offered by Windows 10 that offer basic and detailed forecasts. While some just present you with the basic conditions, others would offer a more detailed view of the situation in an attractive manner. We have tried to make a prototype of website which uses api key to request information using javascript , JSON/AJAX and uses the desktop location to tell the current temperature

Here we have requested an api key from **OpenWeatherMap** and made the web interface using**Vanilla Javascript .**

*Weather Icons***Graphical user interface, text, application, chat or text message

Description automatically generated**

**STEPS TO IMPLEMENT THE PROJECT:**

I’ll briefly summarize what I did for this application:-

We’ll start with the assumption that the list is empty. That is, it has never run any AJAX request in the past. In such a case, we’ll execute a request to the OpenWeatherMap API and pass the following parameters:

* The city name (e.g. athens) or the comma-separated city name along with the country code (e.g. athens,gr) which will be the value of the search field
* The API key. Again, you should use your *own key* to avoid unexpected errors due to API call limits.
* The unit of temperature for the requested city. In our case, we’ll go with Celsius.

Text

Description automatically generated

If you look again at the response visualization above, you’ll notice that the API returns an icon code (e.g. "50d") which holds the current weather condition  for the target city. Based on this code, we’re able to construct the icon URL and display it in

the card via the <img> tag. Inside the .city-name element of each list item, we’ll append the data-name attribute with value the cityName,countryCode (e.g. madrid,es). Later we’ll use this value to prevent duplicate requests.

Text

Description automatically generated**HOW IT WORKS?**

WE HAVE DIVIDED THE DIFFERENT LAYERS IN DIFFERENT DIVISION TAGS AND CREATED A BASIC SETUP :-FOR REST OF THE WORK

Text

Description automatically generated

**CSS CODE :**

First, we’ll add some straightforward styles to the elements of the first section .Column will look like a card with a bottom shadow that will be added via the ::after pseudo-element.

Inside the card, we’ll place weather information about the requested city. These will come from our request, apart from the icons. Those icons, which as mentioned above are grabbed from Envato Elements, will show the current weather condition of this city and match the equivalent OpenWeatherMap icons.

A screenshot of a computer screen

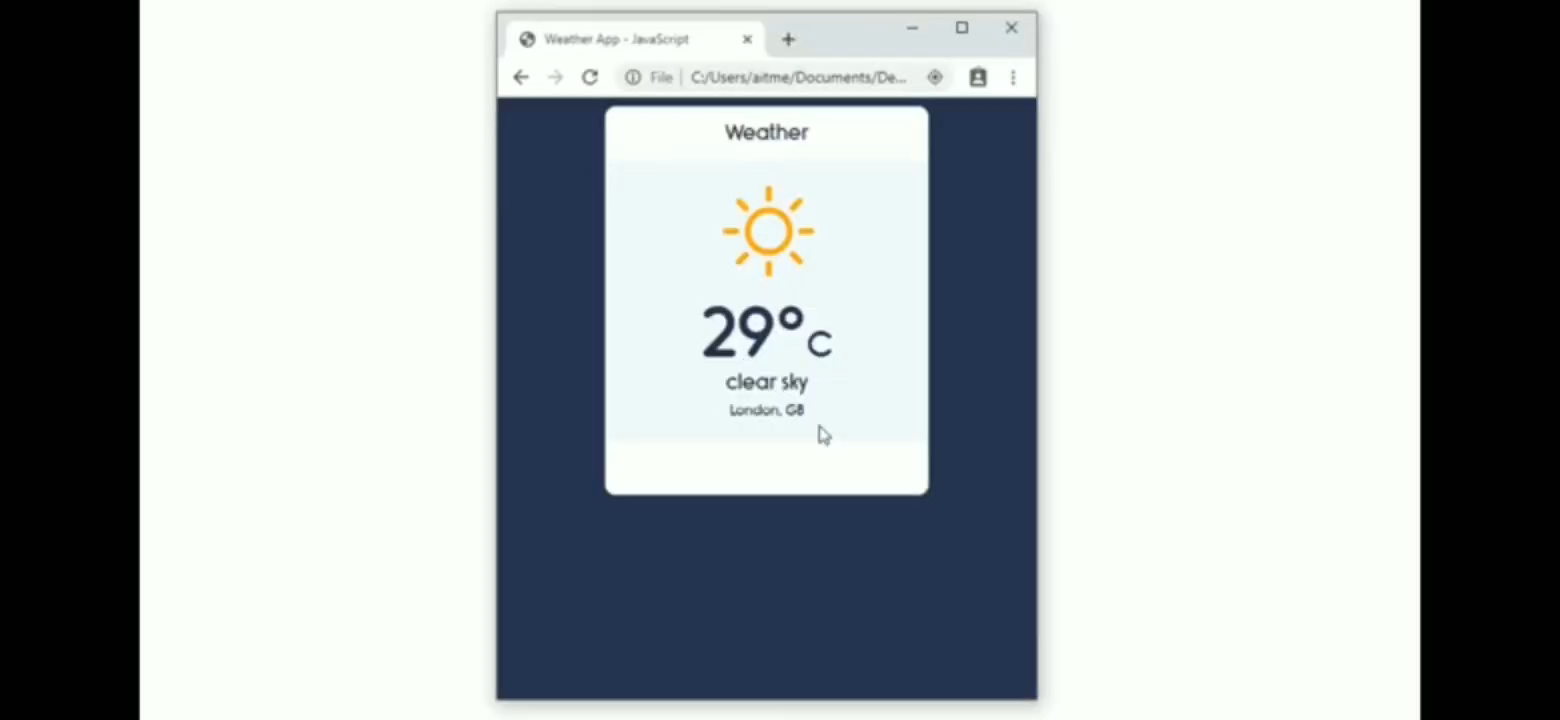
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A screenshot of a computer screen

Description automatically generated

**SUMMARY:**

Hence , in this project, we have successfully built a **Javascript** based project on **Weather-App-Monitor**. The final Working App would like like this :-

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*Diagrammatic representation of the project*

**CONCLUSION**

**INDUSTRIAL RELEVANCE OF JAVASCRIPT:** The number one answer to the question “What industry do you work in?” was -surprise, surprise- “tech”! However, putting this fact aside, the data shows that the financial sector occupies the driver’s seat in JavaScript usage across various industries and on a number of topics. On the other hand, the manufacturing sector seems to be the less… eager industry when it comes to JavaScript usage. More precisely, when it comes to the use of JavaScript tools, finance strikes first with 75% of the respondents reporting using tools compared to 51% of the manufacturing sector. Moving on to more specific tools, the usage of JavaScript frameworks varies greatly across industries. While Angular is relatively popular across all industries, it is definitely winning in popularity among developers in the financial sector. Entertainment seems to fancy React the most while Vue.js is most popular in the advertising and marketing industry.

When it comes to security, everyone is concerned about the security of the code they write (87-90%) and of the open source code they use (73-79%). Of course, developers in tech were more likely to be concerned with security issues but there weren’t any significant discrepancies on the matter across industries.

On the topic of attitudes toward testing across the industries, the results vary greatly. Once again, finance is the leading sector since it is most likely to make use of testing frameworks, contrary to the government and manufacturing sectors which are the industries most unlikely to be concerned with testing.

An HTML page is a static one and without JavaScript it would be static still. JavaScript can make the website more interactive and user- friendliness of JavaScript helps easy navigation of the website and helps designers to guide the visitors with additional information or guide them through walkthroughs. Visual effects can also be achieved with JavaScript. JavaScript can be used effectively to create special effects like rollover for images.

JavaScript not only supports web pages but also supports external applications like PDF documents, running widgets, supporting flash applications etc. JavaScript has emerged in the web industry like a boom and if you look at the current web scenario there are no web technologies that are not using JavaScript. For example AJAX and JQuery, in that the AJAX – Asynchronous JavaScript and XML in which JavaScript plays a very important role and JQuery gives the library for predefined functions for adding animations and many dynamic features to the web pages. AJAX and JQuery are some of the current web trends in terms of [Dynamic website design](https://www.gotechark.com/services/website-design-and-marketing/) and development.

JavaScript stands unique as it brings out all the special functionalities in the client’s browser instead of the site’s server. The role of JavaScript can never be denied as JavaScript can act as both [object oriented language](https://en.wikipedia.org/wiki/Object-oriented_programming) and procedural language.

The importance of JavaScript as a web technology can be determined from the fact that it is currently used by 94.5% of all websites. As a client-side programming language, JavaScript helps web developers to make web pages dynamic and interactive by implementing custom client-side scripts. At the same time, the developers can also use cross-platform runtime engines like Node.js to write server-side code in JavaScript. They can even combine JavaScript, HTML5 and CSS3 to create web pages that look good across browsers, platforms, and devices. There are also a number of reasons why each modern web developer must know how to leverage all benefits of JavaScript. The modern web developers must use JavaScript to make their web applications deliver optimal user experience across various devices, operating systems, and browsers. However, they must be familiar with various JavaScript libraries, frameworks, and tools. They can even combine multiple libraries and frameworks to enhance and extend JavaScript according to requirements of large projects.

**IMPACT OF JAVASCRIPT ON SOCIETY:** JS makes responsive design easier.

JavaScript has become integral to the Internet experience as developers [build increased interaction and complexity into their applications](http://www.coorva.com/). Search engines, ecommerce, content management systems, responsive design, social media and phone apps would not be possible without it.js makes responsive design easier. JavaScript has become integral to the Internet experience as developers build increased interaction and complexity into their applications. Search engines, ecommerce, content management systems, responsive design, social media and phone apps would not be possible without it.

**FUTURE SCOPE OF THE PROJECT:**

JavaScript is the main powerhouse behind the rapidly evolving Internet. It is the present and will be the future. The rampant development of the high-level programming language asserts to the fact of JavaScript is the future.Well, here are some reasons supporting the notion:

* [*Empowers Over 95% of The Web*](https://w3techs.com/technologies/details/cp-javascript/all/all) – As of today (20th December 2018), 95.1% of the Internet is powered by JavaScript. The stats are likely to increase in the near future
* *Excellent Choice of Frameworks* – AngularJS, Ember.js Metero.js, ReactJS, and VueJS are just a few of the wide variety of frameworks available for JavaScript
* *Superfast* – ECMAScript 6 and related technologies are developed for modern web requirements, where speed is a must..
* *Readily Available Packages* – There is a package for almost everything you can think of. In fact, npm is the world’s largest software registry with a total of [over 800,000 build blocks](https://www.npmjs.com/). So, the possibilities of creating with JavaScript are simply immense.

***“ Small progress is still progress.”***

The world of web development is constantly moving. With so many new tools popping up all the time, it can be extremely difficult to know where you should focus your efforts. As an aspiring developer, you’ll want to make sure that what you’re learning is still relevant in today’s industry.

If you’re having doubts about JavaScript, it’s important to know that, since its creation in 1995, JavaScript is pretty much everywhere on the web—and that’s not likely to change any time soon. According to the [2020 StackOverflow developer survey](https://insights.stackoverflow.com/survey/2020#most-popular-technologies), JavaScript is the most commonly used programming language for the eighth year in a row. It is currently used by 94.5% of all websites and, despite originally being designed as a client-side language, JavaScript has now made its way to the server-side of websites (thanks to Node.js), mobile devices (thanks to React Native and Ionic) and desktop (courtesy of Electron).

As long as people are interacting with the web, you can assume that JavaScript is highly relevant—there’s no doubt that this is a language worth knowing! With that in mind, let’s look at some of the key benefits of becoming a JavaScript expert.

The most obvious reason for learning JavaScript is if you have hopes of becoming a web developer. Even if you haven’t got your heart set on a tech career, being proficient in JavaScript will enable you to build websites from scratch—a pretty useful skill to have in today’s job market!

**REFERENCES**

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[**http://www.OpenWeatherMap.org**](http://www.openweathermap.org/)

[**https://github.com/manifestinteractive/weather-underground-icons**](https://github.com/manifestinteractive/weather-underground-icons)