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Versatility of HTML, CSS, and JavaScript in Modern Environments

HTML, CSS, and JavaScript are some of the current cornerstones of the internet and online media in general. A large portion of the functionality of webpages is provided by languages such as JavaScript, while the core information is outlined within HTML and the graphical qualities of the page are provided by CSS. These three languages are important for a wide variety of front-end development tasks and can facilitate the transfer of information to back-end programs, such as providing a textbox to prompt a user for information that will then be sent using languages such as JavaScript and SQL. JavaScript is incredibly useful for creating responsive and dynamic webpages that react to the actions of the user and can allow users to interact with the webpage in ways that would not previously be possible without the addition of this language.

HTML is the language that provides the structure, information, and content within a webpage. It is responsible for the substance and structure of the page rather than the style or interactivity provided by other languages. Although it is possible to create a webpage that consists of exclusively HTML, it would consist of only text, embedded files such as images, very basic organizational aspects such as divisions of content within the page or structures such as tables, and hypertext links without the graphical quality or interactivity that is expected of a modern page. HTML was first created in 1993 by Tim Berners-Lee and has been a foundational language for website development since its inception. According to the MDN contributors of mozilla.org on November 7, 2022, “HTML consists of a series of elements, which you use to enclose, or wrap, different parts of the content to make it appear a certain way, or act a certain way.” These elements can then be defined and specified further using attributes, which allow things such as class and ID names to be assigned for each element within the page. These attributes can be used for stylistic reasons by utilizing CSS, interactive reasons by using JavaScript, or organizational and structural reasons through HTML alone.

A second programming language that is commonly used in web applications is CSS. CSS provides many of the visual and graphical aspects of a webpage. CSS was created by Håkon Wium Lie in 1994 as a way to address the lack of visual options for the internet. Web pages before this point had very little ability to present information in a stylized manner. Both the designers and viewers of webpages desired a way to customize the layout and stylistic aspects of the information that was being presented, so a language that allowed these groups to have control over the graphics of a webpage was a necessary addition to the HTML that was already being utilized in early internet pages. CSS was created to fill this gap and provide a way to alter webpage styles in a relatively easy and intuitive way. CSS functions by allowing an element of HTML to be specified through style rules. These style rules are associated with specific elements within HTML using selectors and property lists. These allow the building blocks of HTML such as classes and IDs to be altered and customized. CSS can also be used to specify the visual changes made to the page when the HTML elements are interacted with, such color changes when hovering the mouse over a button. CSS utilizes inheritance to style interrelated aspects of the page without the need to repeatedly specify the same properties for each individual selector within the document. Overall, CSS is a powerful tool for designing the visuals of a webpage in a standardized, understandable, lightweight, and intuitive way.

JavaScript is a third language that is frequently utilized in modern webpage development. JavaScript is what provides the functionality, most of the interactivity of a webpage, and is much more similar to a standard programming language than HTML or CSS. According to the MDN contributors of mozilla.org on Jan 31, 2023, JavaScript is “a multi-paradigm, dynamic language with types and operators, standard built-in objects, and methods. Its syntax is based on the Java and C languages — many structures from those languages apply to JavaScript as well. JavaScript supports object-oriented programming with object prototypes and classes.” JavaScript supports seven primitive data types including Boolean, String, and Number, and all other pieces of data are known as objects. Objects that can be called upon are called functions. JavaScript also supports variable declaration using keywords for changing or non-changing variable types. Like many other programing languages, JavaScript also supports operators to compare and alter values within the program, objects in the form of key-value pairs, functions, classes, and arrays. The main use of JavaScript for webpages is providing interactive features that would otherwise not be possible when using only HTML and CSS. JavaScript can utilize the stylistic functionality of CSS to change the way that the webpage looks, or the structural and informational aspects of the page through HTML. JavaScript can also be used to track and take advantage of user interactions by saving and sending values entered by the user and to create a more dynamic experience for the user by creating responsive and interactive webpages.

The project that I created to demonstrate my ability in these languages is a webpage for farming and gardening management. Although this page is not yet fully completed, it contains a variety of graphical and interactive components that will be used to assist with planning the harvest and planting dates for the user selected vegetables, options to sort by relevant month or vegetable name, options to receive information on either planting or harvesting the selected vegetables, and a clicker minigame. These options are organized as tabs that the user can navigate through to provide an intuitive graphical experience. The first two tabs provide a dropdown menu to select the desired options for the purpose and organization of the selected options. These two options do not currently affect the webpage in a meaningful way since multiple features have not yet been implemented, but once completed the selected options will allow users to filter and organize the selected crops in their personal growing plan. This feature currently utilizes aspects of HTML such as IDs to organize the content within the page and ensure the dropdown menu can be displayed without the need to hide the currently displayed content. The separation of the individual components that is made possible through HTML is found in the dropdown menu, the separation of relevant and hidden results in the search menu, active and inactive tabs, and many other sources throughout my program. In addition, the JavaScript functions within the file are able to access the relevant pieces of HTML information based on the attributes such as ID and class name and alter the CSS information associated with these elements in order to provide a responsive webpage. A specific example of this is how the selected dropdown menu options are highlighted when clicked and the button clicked on by the user is recorded and saved as a variable to ensure that the preferences can be applied to future result outputs. The search bar present in the third tab contains a text input search bar. When the enter button is selected the text within the search bar is sent to the relevant JavaScript function and used to search for and make visible the vegetables with names that contain those letters. This feature takes advantage of the ability for JavaScript to isolate and alter the CSS of HTML elements, and utilizes the graphical abilities of CSS to hide or display the results that are requested by the user. In future implementations, the user will be able to select the vegetables and save them to a personal growing plan using the same approach to adding dropdown menu options to active or inactive groups. Once this is completed, the fourth tab will display the selected results with the desired organizational scheme and intention so that the user will have a clear outline for when the harvesting or planting of these crops should be completed. The final tab will contain a clicker minigame that will convert clicks on images of crops to points and report an average number of points received in the past two minutes..

JavaScript. CSS, and HTML are invaluable tools for modern development of webpages. These tools are responsible for the content viewable by the user, the way this content looks, and the way this content reacts to interactions from the user. In my program, I have begun exploring the abilities of JavaScript to target and alter CSS and HTML content for elements within the page. This program also utilizes aspects of JavaScript such as variable declaration, if loops, variable reassignment, function parameter usage, and operators to create a functional product. The combination of JavaScript. HTML, and CSS makes it possible for my program to function as a page users can interact with that demonstrates some of the important aspects of these languages.

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