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Assignment 3

WEB701

Angular is an open-source software development framework and platform for building efficient and powerful single page web applications. Angular is one of the most popular JavaScript frameworks for building dynamic web applications.

Angular was created by Google engineers Misko Hevery and Adam Abrons. The first version of Angular, AngularJS was officially released by Google in 2012, and has been maintained ever since.

Angular is a popular framework among web developers for numerous reasons:

* Two-way data binding – In Angular, the code for both HTML and JavaScript is already in sync thanks to AngularJS' architecture, which connects JavaScript and HTML.

As a result, the framework helps developers save a lot of time.

* Directives - The directives in Angular enhance the capability of HTML files.

Developers apply the ng- prefix to HTML attributes to enable directives.

* Code Structure - Templates are provided by Angular, allowing developers to create apps with clean code. It not only saves time, but it also makes it easier to change or fix your projects.
* Testing - Unit and integration testing are supported by Angular.
* Mobile and Desktop capability - Most web browsers can run Angular. Not only on desktop computers, but also on mobile phones and tablets.

The main reason I chose to use Angular for my web application was due to the fact that is uses the Model-View-Controller (**MVC**) architecture.

Model View Controller (MVC) is a design pattern that separates the user interface (View), the data (Model), and the application logic (Controller). This pattern aids in the clear separation of concerns.

Using the MVC design pattern for websites, requests are sent to a Controller which is responsible for working with the Model to conduct actions and/or retrieve data. The Controller selects the View to be displayed and assigns the Model to it. Based on the data in the Model, the View renders the final page.

In the context of Angular, the model is the framework, while the view is HTML, and the control is JavaScript.

* Angular binds JavaScript and HTML
* JavaScript accepts the user input and sends it to Angular
* Angular uses the input to modify HTML

The code between JavaScript and HTML is synchronized thanks to the Angular framework. This makes the developers' life easier, because it decreases the amount of code that needs to be written.

I implemented Angular for my web application using the MEAN stack, which stands for MongoDB, Express, Angular and Node.

MongoDB was the technology I used for my database. MongoDB is a document database, which stores data in JSON-like documents. I used MongoDB Atlas so that my database was stored in the cloud.

Express was the framework I used for my backend server. Express is a minimal and flexible Node.js web application framework that offers a comprehensive range of functionality for both web and mobile apps. With a variety of HTTP utility methods and middleware, Express lets you quickly and easily build a powerful API.

Node.js is allows you to build scalable network applications, as it is an asynchronous event-driven JavaScript runtime environment.

In my web application, the Angular framework was used to build the client-side user-interface, Express was used to build the server-side API, MongoDB was used as the database, and the whole application was built on the Node JavaScript Runtime, using packages provided by the Node package manager (NPM).

To build my Angular application, I created various components. These components consist of a HTML, TypeScript and CSS file. The HTML file handles the content seen on the page in generic HTML. HTML classes are bound to methods in the TypeScript file using the ng- directive. When a user performs an action, the directives within the HTML file call methods in the TypeScript file to execute the methods.

The Navigation of the application is done in the app-component.HTML file. This lets you assign nav bar items with a path, such as ‘/home’. The actual routing of the application is done using Angular’s RouterModule in the app-routing.module.ts file. This file listens for paths that the user tries to access. If the user clicks on the ‘Home’ button in the nav bar for example, the app-routing.module.ts file decides what components to show on that page, based on what component the developer has decided to show on that page.

This creates the basis of the web application. Nav bar items are assigned routes, and then these routes have components assigned to them. This way, the developer can decide what page shows what component.

The main problem faced using the Angular framework, is that it uses TypeScript instead of plain JavaScript. While TypeScript is great for validating whether the code is working correctly, it does require the developer to give all objects a type. Many times throughout the development process, objects were given the type ‘Any’ just to allow the code to compile. At the beginning of the development this was a nuisance, but as time went on, the reasoning behind giving objects types became more clear. TypeScript saves time by catching errors and providing fixes before the code is even run.

Angular is among the most popular JavaScript frameworks in the world. As of 2021, the three most popular JavaScript frameworks are Angular, React and Vue. From research, multiple sources indicate that Angular is the best framework when it comes to building large and complex applications, while React and Vue are better suited for smaller and less complex projects, though all three frameworks are capable of doing both. Vue, being the newest of the three frameworks, was built with the concept of using the best features from both React and Angular. For this reason, I believe that Vue will become the most popular and widely used framework in the world in the future. Vue’s easy learning curve and single-file component approach is what may push it over the edge into become the most popular framework with some more time. That being said I believe that Angular is and will remain the best option for large and complex projects, as it is a standalone framework that does not have many dependencies on other libraries which can complicate team-based projects.