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8/20/23

CS405

**Architecture**

* Compare and contrast the types of frontend development you used in your full stack project, including Express HTML, JavaScript, and the single-page application (SPA).

HTML, or Hypertext Markup Language, is the most commonly used markup language on the internet. HTML forms the backbone of the design of web sites. On its own, HTML does not actually have programming capability, and is only capable of producing static webpages without outside help. Express is a framework made for developing Node.js web servers. Using Express makes the process of creating APIs easier because it extends a lof of Node.js’s functionality. JavaScript is a programming language used by front end developers due to it being lightweight and high level. Some of the most popular web development framework were built on JavaScript, including Node.js and Angular, both of which are used in this project. Angular is a front end SPA framework that allows developers to create single page applications. An SPA is different from an Express application because SPAs front load all of the code to the client when the site is first visited. The client is then able to perform functions that the server would have to, which helps cut down on calls to the Server.

* Why did the backend use a NoSQL MongoDB database?

Because NoSQL databases are document based, they are very easy to scale and do not require rigid modeling like SQL generally does. This is good in the case of Travlr Getaways because it allowed for changes to the API structure to be made very easily. If eventually more features get added to the site, a complete redo of the server would not be needed. Additionally, MongoDB’s documents are structured like JSON objects, allowing easy conversion between the two formats.

**Functionality**

* How is JSON different from Javascript and how does JSON tie together the frontend and backend development pieces?

JavaScript is a programming language, commonly used by front end developers due to it being lightweight and easy to use. As an Object Oriented language, JavaScript has the ability for the developer to create objects and classes. Objects in JavaScript are represented by JavaScriptObjectNotation, or JSON. In the case of Travlr Getaways, JSON is used to model data going to and coming from the Database.

* Provide instances in the full stack process when you refactored code to improve functionality and efficiencies, and name the benefits that come from reusable user interface (UI) components.

One clear instance of refactoring during the fullstack process was the implementation of the Handlebars Templating Engine. Handlebars allows portions of HTML to be extracted to a separate file as a template and then called back into pages with curly braces. This allows pages that use common features, like a navigation bar, to share a common resource instead of needing to recreate the feature on every page. Initially, the nav bar in the Travlr web application was hard coded into each page. Using Handlebars, the nav bar was turned into a template and called back in. This refactoring cut redundant code and increased the speed of the application.

**Testing**

* Methods for request and retrieval necessitate various types of API testing of endpoints, in addition to the difficulties of testing with added layers of security. Explain your understanding of methods, endpoints, and security in a full stack application.

In order to test all of the API endpoints during this project, I primarily tested using the localhost page and manually loading pages to ensure that the API calls worked correctly. Later on, I began using Postman, which automates a lot of the process of testing API calls. Security in a full stack application in this case was done using JSON-Webtoken and checking for Authorization. This is the first step in a AAA security model.

**Reflection**

* How has this course helped you in reaching your professional goals? What skills have you learned, developed, or mastered in this course to help you become a more marketable candidate in your career field?

This course has helped me in reaching professional goals by teaching basic skills needed to perform all aspects of full stack development. I have learned a lot of new skills, including JavaScript, creating Application Programming Interfaces, Express, Node.js, and Angular SPAs. Having an understanding of how to create MEAN stack applications has given me the skills to create websites on my own, a task I plan to do to help practice more.