Web Science

Quiz 1: February 28, 2023

Enter your answers directly into this document (with the exception of #2 and #3).

All answers should be In Your Own Words, using complete sentences with proper spelling and grammar.

Save this document as either a Word docx or a PDF. For all questions other than #2 and #3, you will not receive any credit for answers not placed in this document.

When finished with the quiz, put everything you wrote (this document, all code, etc.) in your personal GitHub repo in a folder named **quiz1**. You must test your code on your VM, served with Node. No Apache!

1. **Short answers** (25 points): (Answer in complete sentences, explain your answers)
   1. (5) What are the potential advantages of using TypeScript’s type system as opposed to typeless JavaScript?

TypeScript is a superset of JavaScript that adds optional static type checking to the language. The potential advantages of using typescript’s type system as opposed to typeless Javascript include 1) catching errors at compile-time, TypeScript’s type system can catch errors at compile-time, which can save a lot of debugging time and improve code quality. 2) Enhanced developer productivity: With TypeScript, developers can benefit from better code completion and more accurate code suggestions, as well as improved refactoring tools. This can help save time and improve productivity. 3) Better code organization: Type annotations can help organize and structure code, making it easier to read and understand. Type annotations can also help document code and serve as a form of self-documentation.

* 1. (7) What is a package.json file? What is it used for? How is it created?

It is a configuration file used in Node.js to define project metadata and dependencies. It contains information such as the name, version, description, author, license, and other important details about a project.

The uses of the package json file include:

1. Defining project metadata, like information I mentioned before
2. Managing project dependencies: Project dependencies are listed in the dependencies and devdependencies fields, which can be installed and updated using npm
3. It can be used to define scripts by npm run

To create package.json file, the command needed to use is npm init. Then it will ask you some questions and create a new package.json file in the directory.

* 1. (3) Of the following permutations, identify which are valid and which are invalid for shipping/installing a Node application: 1. (package.json && package-lock.json); 2. package.json only; 3. package-lock.json only

1. The most common and valid approach for shipping/installing a Node application.
2. This method is valid but not recommended. This can lead to issues with inconsistent builds and potentially introduce security vulnerabilities.
3. This is not valid.
   1. (10) Describe **in detail** the sequence(s) of transaction(s) for a frontend to request data from some external entity via Node.
4. User request. User interacts with the frontend interface like clicking a button to initiate a request for data
5. Frontend sends requests to Node backend using HTTP request. The request include endpoint URL, request headers and data needed.
6. Node backend receive and process request. This may involve authenticating the request, validating input, and querying a database or external API for data.
7. Backend sends response to frontend. The response typically includes a status code, response headers, and the requested data.
8. Frontend receives and displays data. This may involve rendering the data in a particular format, updating a view, or triggering further actions in the frontend.
9. **Coding question**: (60 points) Here is a free API that does not require any API keys: <http://universities.hipolabs.com/> – the documentation for which can be found here: <https://github.com/Hipo/university-domains-list>  
     
   Create a new input box (or extend an already created input box) that can accept the name of a university and returns the API’s information about that university. If the user fails to input a valid university, return the information for RPI. You might want to extend a recently due lab…  
     
   Creativity matters; you need to really integrate this new information into your app. Make it feel like it is a meaningful, conscious, intentioned feature of your app. How you do that is up to you. Don’t make it look like some random afterthought. Go beyond the minimum (but remember that creativity doesn’t have to be visual). If you need to, write a short README.md file that tells me what I should consider for creativity. (creativity: 30 points of the 60 available for this question)  
     
   ***You may use any and all open source libraries you want for this coding question, so long as you cite them in a README.md file.***

1. (15) Ensure the package.json file for Q2 has no errors when I run npm install.

It doesn’t have any error.

1. **Extra credit (+5)**: Why do your URLs need /node/ in order for Node to serve web pages on your VM?

In some cases, web applications built with Node.js use a specific routing framework or middleware that requires URLs to be structured in a particular way, which could include "/node/". For example, some developers might use the Express.js routing framework to build their Node.js web applications. Express.js has a default behavior where it requires URLs to include a base path that indicates the starting point for routing. By default, this base path is "/". However, it is possible to configure Express.js to use a different base path, such as "/node/", by specifying the appropriate options when setting up the application.