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)

    a. (5) What are the potential advantages of using TypeScript's type system as opposed to typeless JavaScript?

Typescript's advantages over JavasScript in regard to types improves the development experience in a number of ways. The first way is types provide additional information to the language server provider so 'intellisense' works better in typescript. Second, Typescript ensures that less errors are made duing the development process by telling you during the compile process that type misalignment has occured. It also gives some relative safey against undefined/nullability when compated to JavaScript.Mainly Typescript is an important tool in building JS based applications because it helps the codebase scale in number of developers and size, while maintaining the sanity of developers who don't have to guess at what types go where, as compared to javascript which is loosely typed.

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

A package. json file contains metadata about your project including it's name, version, license, scripts and dependencies. It is used for most modern javascript projects using npm or yarn. It is created by hand, cat > package.json, or by using npm init -y or yarn init. Or by using one the myriad project generators on npm.

    c. (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: Valid

- 2: Also valid, just yolo's it and gets whatever satisfies the specific / minimum requirements in
- 3: Invalud

d. (10) Describe **in detail** the sequence(s) of transaction(s) for a frontend to request data from some external entity via Node.

- Client HTML is loaded
- Client JS is loaded in chunks
- Somewhere in the code is a callsite containing an xhr request, eg: fetch
- Client makes a request to the backend via a known url for the backend (api)
- Node api endpoint receives client data
- Node api contains logic and calls out to another service to fetch data
- The request completes successfully
- The node api may optionally transform the response to the client
- The node api serializes the response
- it is sent back over the wire with res.send / res.json
- The client sees its request complete
- The client renders the data

2. **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.

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

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

Because apache is fronted as a proxy on privileged port 80 and 443, so it has a path redirect that maps /node/ to port 3000.