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?

There are quite a few advantages to using TypeScript over typeless JavaScript, namely being able to detect type-related errors during development because TypeScript enforces types opposed to vanilla JavaScript. A few other advantages include better collaboration, better readability, and more features.

Team collaboration and readability go hand in hand for TypeScript, as there is a comment feature that allows commenting while typing code, typing allows for less errors when others work on code since it is easier to read and understand the code, and it detects errors while writing the code so it is less prone to errors in the first place. Some additional feature TypeScript offers include like interfaces, type aliases, abstract classes, function overloading, tuples, and generics.

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

A package.json is a JSON file that is held in the root directory of a Node.js project. It contains metadata about the project such as dependencies, scripts, main, name, version, description, and other information. It’s main purpose is to manage the metadata perhaps most importantly dependencies, main, and scripts. The package.json can either be made with npm init or it can be created manually by whoever is starting the project.

* 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

You need both a the package.json and package-lock.json, as the package.json has all the necessary metadata to run the application and you need the package-lock.json because it holds the versions of the dependencies used for the application so including it ensures the same node\_modules tree is generated when another user runs npm install.

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

The frontend sends an HTTP request to the Node.js server, which contains information on what endpoint to get the data from. The node server then receives the request and sends an HTTP request to the external server, which contains information on what endpoint to get the data from. The external server receives the HTTP request gets the information and sends back a response to the Node server containing the requested information. The Node server receives the response from the external server then converts it to the format the application needs or pipelines the information directly to the frontend.

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

The URLs need /node/ in order to serve web pages with node because we are using node as a proxy for Apache on local host port 3000 and in the 000-default.conf we have defined the it to be serving the node proxy on /node.