**PART 1**

**1.1** Describe in your own words how the web works! In as much detail as you can, describe **all** the sequences of events that take place from the time a user presses Enter on the keyboard after typing in [www.rpi.edu](http://www.rpi.edu) into the address bar to when the webpage is finished rendering in the browser. Specifically, tell me in great detail the protocols in action. (10 points)

**Answer:** The web works by heavily relying on the DNS, also known as the “Domain Name System.” The DNS is essentially, a directory of domain names. When a user were to type in [www.rpi.edu](http://www.rpi.edu) (a domain name / URL) into their browser, something called the DNS Iterator is used to go through each component of the URL, and narrow down the options / locations of what server the website could be located in, until the specific address is found. To start, the user types the URL into the browser on their local host device, which then goes to the Iterator. From there, the Iterator asks the root nameserver where to find [www.rpi.edu](http://www.rpi.edu). Suppose in this case it doesn’t know where to find the website, but rather redirects the iterator to another server who might know (such as the .edu nameserver, just as an example). Then, the iterator would go to the Top Level Server, and the same process is repeated. From there, the iterator would ask the Authoritative Server, which would most likely be able to find the specific location address for [www.rpi.edu](http://www.rpi.edu). The Iterator then returns that address to the local host device, and the website is loaded onto the screen. Additionally, it is worthwhile to note that this process is ultimately like reading a Unix dictionary backwards. So in this case, www.rpi.edu would be “read” as /edu/rpi/www.

**1.2** What is the difference between a property and a method in JavaScript? (3 points)

**Answer:** Overall, JavaScript is essentially key-value pairs stored inside a hash. A JavaScript property is a value stored in the hash key. This can be easily compared to a method, which is a function stored inside a hash key. In other words, properties are key-value pairs that work with primitives, whereas methods working with functions, which are considered an object.

**1.3** Explain how your browser chooses which CSS rule to apply to a tag in the case where there are multiple rules that could apply. (3 points)

**Answer:** When multiple rules can apply, then CSS Specificity is used. CSS Specificity is when rules matching the same element with the same declaration conflict, the declaration's rule with the higher specificity will be used. There are four categories which define the specificity level of a selector. First priority is Inline styles, which is attached directly to the element that is going to be styled. Secondly is IDs, which is an identifier for the element that is given in a “hashtag form” (ex: #navbar). Next are Classes, attributes, and pseudo-classes, which is a set of modifications that can be used for multiple elements within a document, as long as the class tag is used (just as an example). This receives lower priority then both the Inline style and the ID, however, have higher priority over the last category, which are Elements and pseudo-elements. Elements and pseudo-elements include element names such as h2 and div. It is important to note that if the same rule is written twice into an external CSS, then the rule that is closest to the element will be applied.

**1.4** State **four** total advantages of “separation of concerns,” for any permutations of that term we discussed in class. (4 points)

**Answer:** separation of Concerns is the idea that **each part in an application should not be responsible or contain code that deals with multiple things.** But rather, only deals with one specific functionality within the application. Four total advantages of Separating concerns, is firstly, it reduces code complexity by splitting up a larger program into many smaller parts. Secondly, this will therefore keep the code more organized. Thirdly, given the code is more organized, it will therefore be easier to read and potentially make edits to without affecting any other part of the program that the developer may want to leave untouched. Lastly, Separation of concerns makes the code much easier to be peer reviewed by other classmates, or other developers themselves, which allows for more effective feedback and potentially clearer explanations or comments about the application.