

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)

After a user types the URL into the address bar of their web browser, the web browser looks up the IP address for the domain name via DNS. The domain name naming scheme is read backwards, for [www.rpi.edu](http://www.rpi.edu) would be read as edu, rpi, then www. The web browser first searches through its cache to find the IP address for the URL. If it doesn't find the IP address, it then searches the computer's host file. The host file, a hash file that processes DNS, is then searched. After searching the host file and the address is not already there, the DNS cache on the router then gets searched. If the IP address isn't there, then the ISP's cache then gets searched. If it isn't there, the ISP then makes requests to other name servers, starting from edu to rpi and then www until it finds the IP address. After getting the IP address, the web browser then sends an HTTP request to the web server. The HTTP request requires a verb, such as GET, followed by a header. The header is a key-value pair which also has which HTTP protocol the user is requesting, such as HTTP 1.1 or HTTP 2.0. After the server sends back a response, the server supplies the HTML, CSS, JavaScript, etc. back to the user's web browser. The rendering engine for the web browser then start collecting the contents of the page. The different files are loaded and then parsed. After parsing the files, the document is set as interactive and files that are in "deferred" mode are parsed after the entire document is parsed. After all the files have been parsed the page is then loaded fully to a state where the user can then interact with the website.

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

A property in JavaScript has a value while a method doesn't. A method in JavaScript has logic while a property doesn't. This is due to methods being functions. The syntax for a method uses parentheses, "()", while properties do not. For example:

```
var homework = {};
```

```
homework.done = false;
```

```
homework.completeHW = function () { homework.done = true; };
```

To change the property of my homework object, I would need to use a method to change `homework.done = false` to `homework.done = true`.

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)

The browser chooses what CSS rule to apply to a tag based on the specificity of the selector for the tag. The hierarchy for a selector is ID, class, and then the tag name. The ID selector applies to the specific tag due to its use being to identify one element, the class selector applies to more than one element of the tag, and the name selector applies to all the elements of the tag. The selector can then have selector combinators such as “ ” which selects all the descendants of the tag, “>” which selects the child of the tag, “+” which selects the tag adjacent to the tag, and “~” which selects the general sibling of the tag. The sibling terminology references the same depth level of the tag. The hierarchy terminology references difference depth levels of the tag.

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

One advantage for “separation of concerns”, which includes: presentation, UI/PHP/Logic, and database, is that it increases the maintainability of the software due to the code being separated into individual chunks that would result in less code having to be changed. The second advantage is that it allows the addition of features to be much easier as you don't have to change all the code to make it work since it's being added onto an individual part of the software. The third advantage is that it allows the changing of code to not break other parts of your program. Splitting up the concerns reduces the possibility of changing the behavior of a feature by accident when changing the behavior of another one. The fourth advantage is that it allows code to be used in other programs as well. If you want to have a similar feature in another program, it is as simple as copying the code into the new program without having to do too much manipulation.