How the Web Works

In this lab, you'll be working with a partner to explore a little more about the internet, the web, requests, responses and more. You'll be reading and writing about concepts as well as practicing some of the commands that we saw during the lecture earlier.

Topic 1: The Internet and the World Wide Web

1) What is the internet? (hint: here)
   A huge network of computers and servers.
2) What is the world wide web? (hint: here)
   Its like the UI for the internet.
3) Partner One: read this page on how the internet works, Partner Two: read this page on how the world wide web works. When you're done reading, come back together and and answer the following questions
   a) What are networks?
      Two or more things that communicate to each other.
   b) What are servers?
      A computer that can store things like websites, or data.
   c) What are routers?
      Makes sure that a computer message is sent to the right destination.
   d) What are packets?
      A small amount of data.
4) Come up with a metaphor for the internet and the web, you can do a single one if you think of one that puts them together or two separate ones (feel free to use one you've heard today or read about if you can't think of a new one, but spend at least 10 minutes trying to think of something different before you resort to that)
   Internet is the Water supply to home, Routers are the pipe that leads to different appliance, appliances the clients, and the water treatment facility is the servers. And plumbers are the software engineers. Packets are water droplets.
5) Draw out a diagram of the infrastructure of the internet and how a request and response travel using your metaphor (like the map and letters we saw during the lecture). Insert the drawing into this document (can be a picture of a physical drawing, a Google Drawing, a Figma drawing, etc)

Topic 2: IP Addresses and Domains

1) What is the difference between an IP address and a domain name?
   Domain names are stringified placeholders for Ip addresses.
2) What's devmountain.com's IP address? (Hint: use 'ping' in the terminal)
   104.22.13.35
3) Try to access devmountain.com by its IP address. It shouldn't work because we have our sites protected by a service called CloudFlare. Why might it be important to not let users access your site directly at the IP address?
   Resource it takes to host multible websites on multible ip address can be inefficent.
4) How do our browsers know the IP address of a website when we type in its domain name? (If you need a refresher, go read this comic linked in the handout from this lecture)
   Through a DNS, it will correlate a Domain name with an IP address/

Topic 3: How a web page loads into a browser

The steps of how a web page is requested and sent are in the table below. However, **they are out of order**. Unscramble them and explain your thinking/reasoning in the second two columns of the table.

Steps Scrambled	Steps in Correct Order	Why did you put this step in this position?
Example: Here is an example step	*Here is an example step*	*- I put this step first because ____* *- I put this step before/after ____ because ____*
Request reaches app server	2	Because the server need to see the request before anything else can happen
HTML processing finishes	4	The HTML will need to be processed.
App code finishes execution	5	Because the code needs to load before every thing can be displayed
Initial request (link clicked, URL visited)	1	The request will need to be made first Computers cant read minds
Page rendered in browser		This is the final step of bringing media to the user.
Browser receives HTML, begins processing	3	The browser gets the HTML from the server after the request.

Topic 4: Requests and Responses

Setup

- Download the folder for this exercise from Frodo.
- Make sure you unzip it.
- Open it in VS Code
- Run `npm i` in the terminal (make sure you're in the web-works folder you just downloaded).
    - You'll know it was successful if you see a node_modules folder in the web-works folder.
- Run `node server.js` in the terminal (also in the web-works folder) and you should see a log to the terminal saying 'serving up port 4500'
- You'll be using this file to figure out what will happen when you make requests to this server, so read it over to see what's going on. We'll be getting into the two GET functions and the POST function.

Part A: GET /

- You'll start by looking at the function that runs when we make a get request to /, which looks like this: http://localhost:4500 or http://localhost:4500/
- You'll use the curl command to make a request and read the response in your terminal

1) Predict what you'll see as the body of the response:
   Jurnni Jounling your journies
2) Predict what the content-type of the response will be:
   Text

- Open a terminal window and run `curl -i http:localhost:4500`

3) Were you correct about the body? If yes, how/why did you make your prediction? If not, what was it and why?
   By looking at the code and reading the h1 and h2 elements.

4) Were you correct about the content-type of the response? If yes, how/why did you make your prediction? If not, what was it and why?
   Based on the element tags used.

Part B: GET /entries

- Now look at the next function, the one that runs on get requests to /entries.
- You'll use the curl command again. This time, you'll need to figure out how to modify it to get the response that you need.

1) Predict what you'll see as the body of the response:
   Array data
2) Predict what the content-type of the response will be:

- In your terminal, run a curl command to get request this server for /entries
  Array.

3) Were you correct about the body? If yes, how/why did you make your prediction? If not, what was it and why?
   Because of the lone array that was getting sent out to be on the screen
4) Were you correct about the content-type of the response? If yes, how/why did you make your prediction? If not, what was it and why?
   yes and no, it was application JSON, because of the object that was pushed and not HTML.

Part C: POST /entry

- Last, read over the function that runs a post request.

1) At a base level, what is this function doing? (There are four parts to this)
   Creates an object, then it pushes the object, increments the global variable, and displays the entries array.
2) To get this function to work, we need to send a body object with our request. Looking at the function in server.js, what properties do you know you'll need to include on that body object? And what data types will they be (hint: look at the objects in the entries array)?
   Will need and ID that will be an Integer, a Date that will be a String, and Content that will be a string.
3) Plan the object that you'll send with your request. Remember that it needs to be written as a JSON object inside strings. JSON objects properties/keys and values need to be in **double quotes** and separated by commas.
   '{"id": globalId, "date": "July 29", "content": "Uhh Sorry"}'
4) What URL will you be making this request to?
   http://localhost:4500/entries
5) Predict what you'll see as the body of the response:
   We will see the whole array
6) Predict what the content-type of the response will be:

- In your terminal, enter the curl command to make this request. It should look something like the example below, with the information you decided on in steps 3 and 4 instead of the ALL CAPS WORDS.
  Application/JSON
  - curl -i -X POST -H 'Content-type: application/json' -d JSONOBJECT URL

7) Were you correct about the body? If yes, how/why did you make your prediction? If not, what was it and why?
   Yes, because of the output last time

8) Were you correct about the content-type of the response? If yes, how/why did you make your prediction? If not, what was it and why?
   Yes because of the output last time, and it not being an HTML element.

Submission

1. Save this document as a PDF
2. Go to Github and create a new repository. (Click the little + in the upper right hand corner.)
3. Name your repository “web-works” (or something like that).
4. Click “uploading an existing file” under the “Quick setup heading”.
5. Choose your web works PDF document to upload.
6. Add “commit message” under the heading “Commit changes”. A good commit message would be something like “Adding web works problems.”
7. Click commit changes.

Further Study: More curl

Visit this link and do the exercises using the website provided. Keep track of the commands you used in this document. (Don’t forget to resubmit to GitHub when you complete this section)