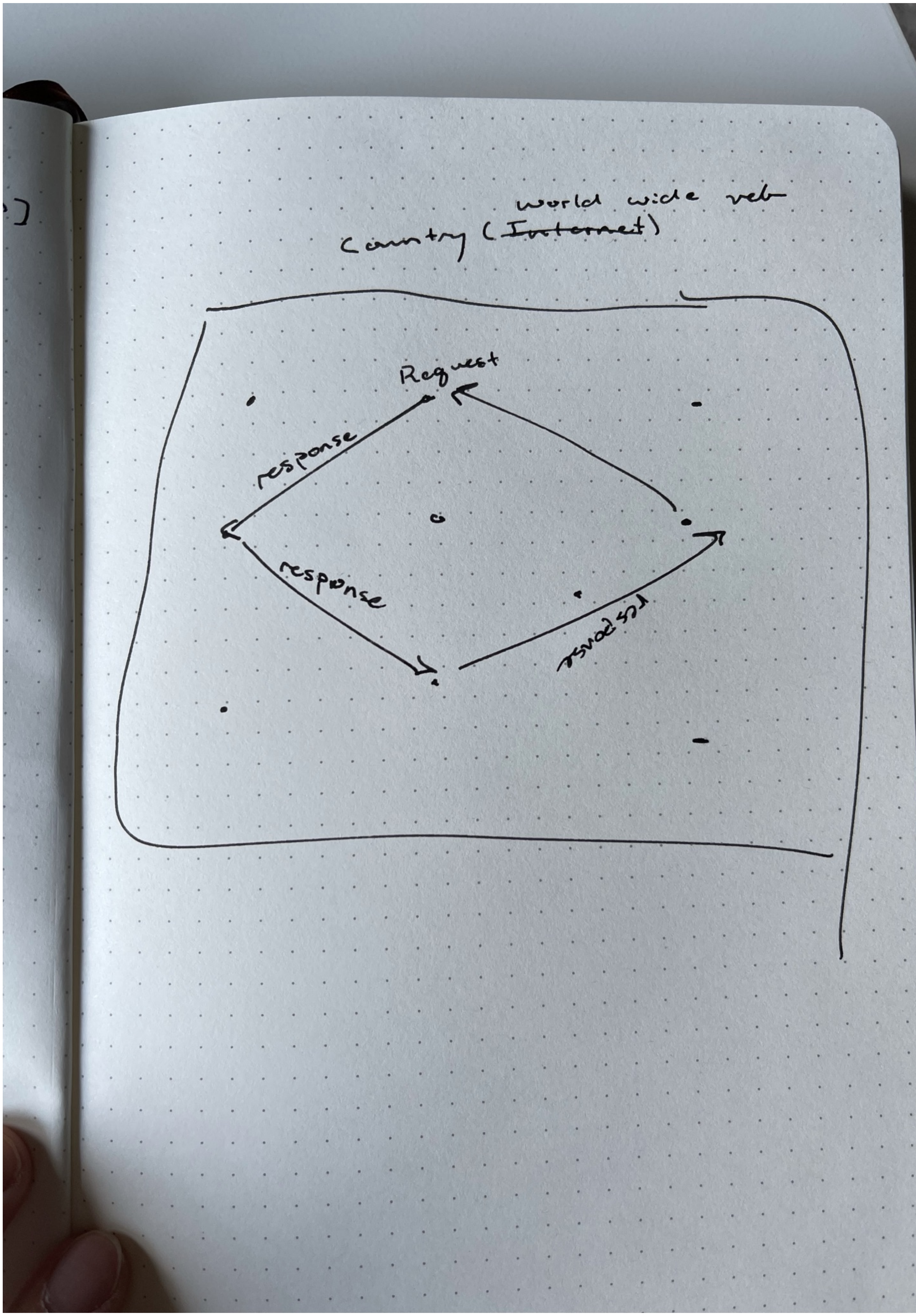
How the Web Works

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) The internet is a world wide network of local networks
2) What is the world wide web? (hint: here)
    a) Interconnected system of public connected web pages accessible through 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?
        i) When 2 computers need tto communicate with each other, you need need to connect the m wirelessly or wired.
    b) What are servers?
        i) Computer that runs websites, they store process and deliver web pages to the users.
    c) What are routers?
        i) A networking devices that decides data packing direction
    d) What are packets?
        i) Formatted chunk of data sent over a network
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)
    a) Internet is like a country, and the web is like the roads, and highways, connecting cities like the local networks
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)


world wide web
Country (~~Internet~~)
Request
response
response
response

a)

Topic 2: IP Addresses and Domains

1) What is the difference between an IP address and a domain name?
    a) An IP address is like your home address assigned to you by your ISP. The domain is a string of texts used to access a website from a client software. So people don't have to type in numbers
2) What's devmountain.com's IP address? (Hint: use 'ping' in the terminal)
    a) 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?
    a) Because they can collect your data on your website DDoS
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)
    a) That's how they can communicate to each other.

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	Initial request	I put this step first because you need to first request before you get anything back
HTML processing finishes	Request reaches app server	I put this step after initial request because once you send the request is has to be received somewhere to get a response
App code finishes execution	Browser receives HTML, begins processing	I put this step after request reaches app server because once the server responds only then can your browser start processing
Initial request (link clicked, URL visited)	HTML processing finishes	I put this step after browser receives HTML because your browser can't process HTML if it doesn't have one.
Page rendered in browser	App code finishes execution	I put this step after HTML processing finishes because
Browser receives HTML, begins processing	Page is rendered in browser.	This is the last step

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:
    a) Jurni, Journaling your journeys
2) Predict what the content-type of the response will be:
    a) Document

- 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?
    a) I wasn't sure what would happen
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?
    a) No, I wasn't sure what would happen

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:
    a) Id 0 date, January
2) Predict what the content-type of the response will be:
    a) Document

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

3) Were you correct about the body? If yes, how/why did you make your prediction? If not, what was it and why? Yes
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

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)
    a) Adding a new entry to the new entries object 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)?
    a) Id, date, content,
    b) ID type document
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.
    a) Id will be 3 date will be June 18 and content will bye world
4) What URL will you be making this request to?
    a) http://localhost.4500/entries
5) Predict what you'll see as the body of the response:
    a) The original of what they had before plus your additional entry.
6) Predict what the content-type of the response will be:
    a) Document
- 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.
    - 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?
    a) Yes
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?
    a) Yes

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)