GENERAL ASSEMBLY

JAVASCRIPT DEVELOPMENT

Sasha Vodnik, Instructor

HELLO!

1. Pull changes from the `svodnik/JS-SF-12-resources` repo to your computer
2. Open the `10-ajax-apis/starter-code` folder in your code editor

AJAX & APIS

LEARNING OBJECTIVES

At the end of this class, you will be able to

- Identify all the HTTP verbs & their uses.
- Describe APIs and how to make calls and consume API data.
- Access public APIs and get information back.
- Implement an Ajax request with vanilla JS.
- Create an Ajax request using jQuery.
- Reiterate the benefits of separation of concerns – API vs. Client.

AGENDA

- APIs
- HTTP
- Ajax using Fetch
- Ajax & jQuery
- Separation of concerns

WEEKLY OVERVIEW

WEEK 5	Events & jQuery / Ajax & APIs
WEEK 6	Asynchronous JS & callbacks / Advanced APIs
WEEK 7	Project 2 Lab / Prototypal inheritance

EXIT TICKET QUESTIONS

1. Is 'bubbling' what Event Delegation does?
2. I always feel like I get it in class but when I do the hw at home I don't understand 😭

AJAX & APIS

ACTIVITY

TYPE OF EXERCISE

- Individual/Partner

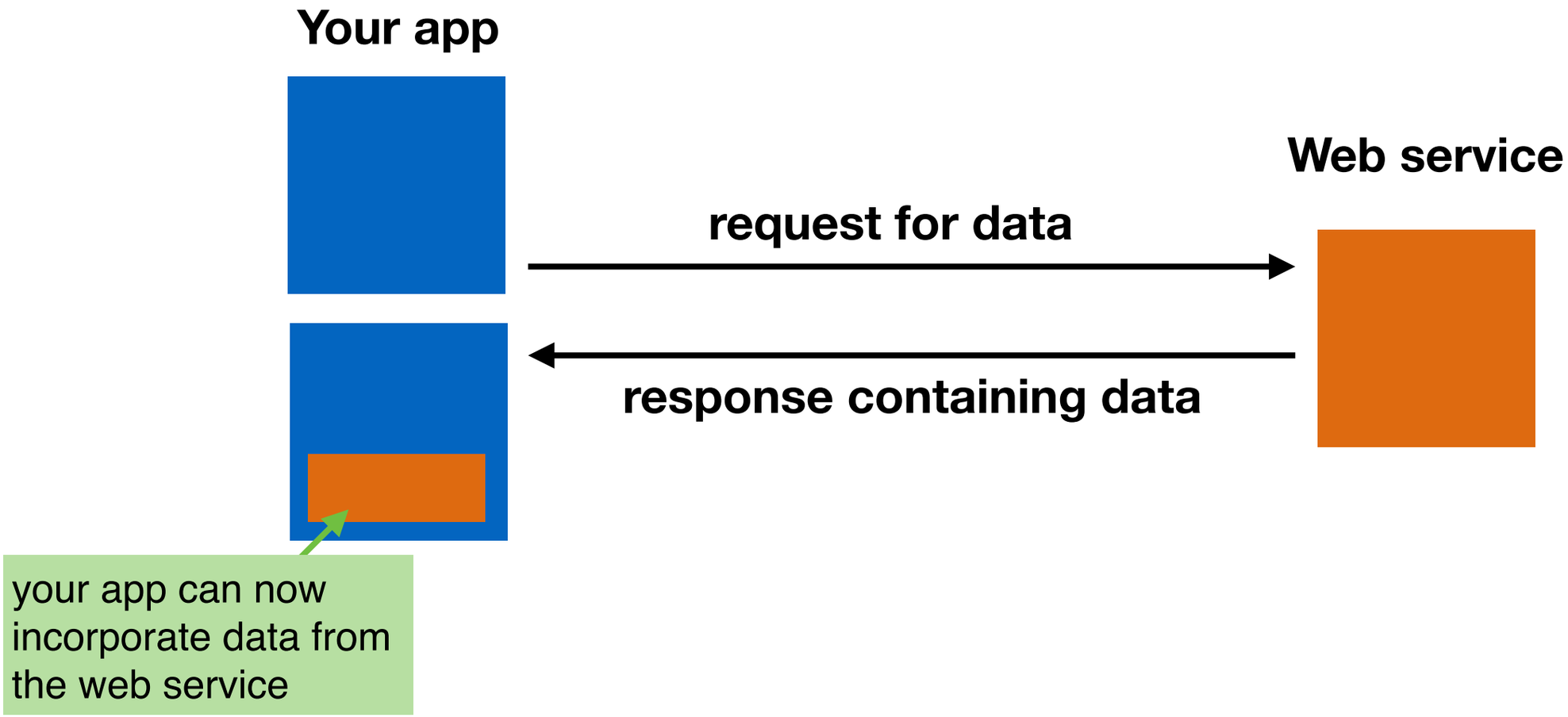
TIMING

3 min

1. Think about how you could use one or more sources of web data in an app.
2. Write a description or sketch a schematic of your app on your desk.

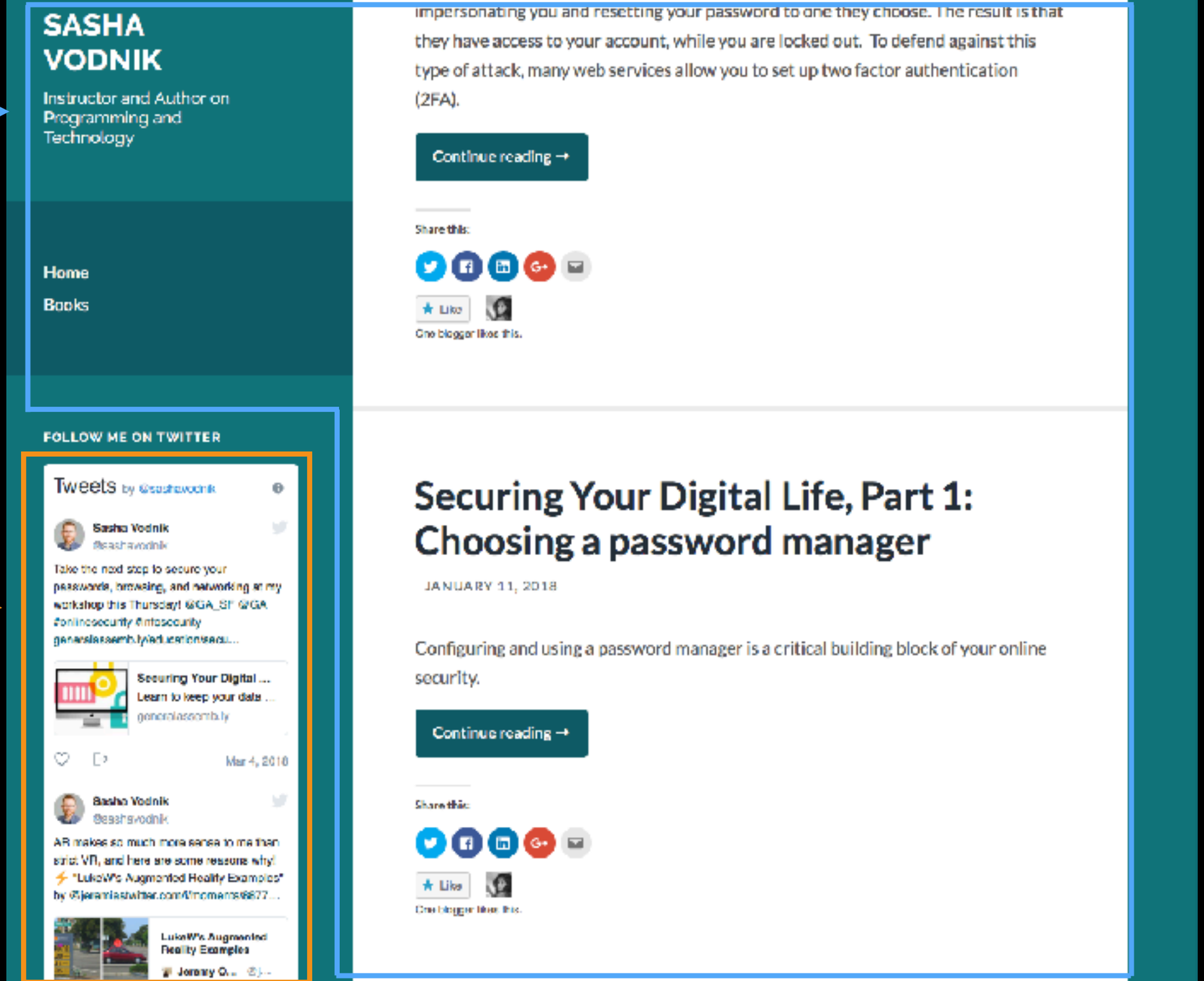
APIs

WEB SERVICES

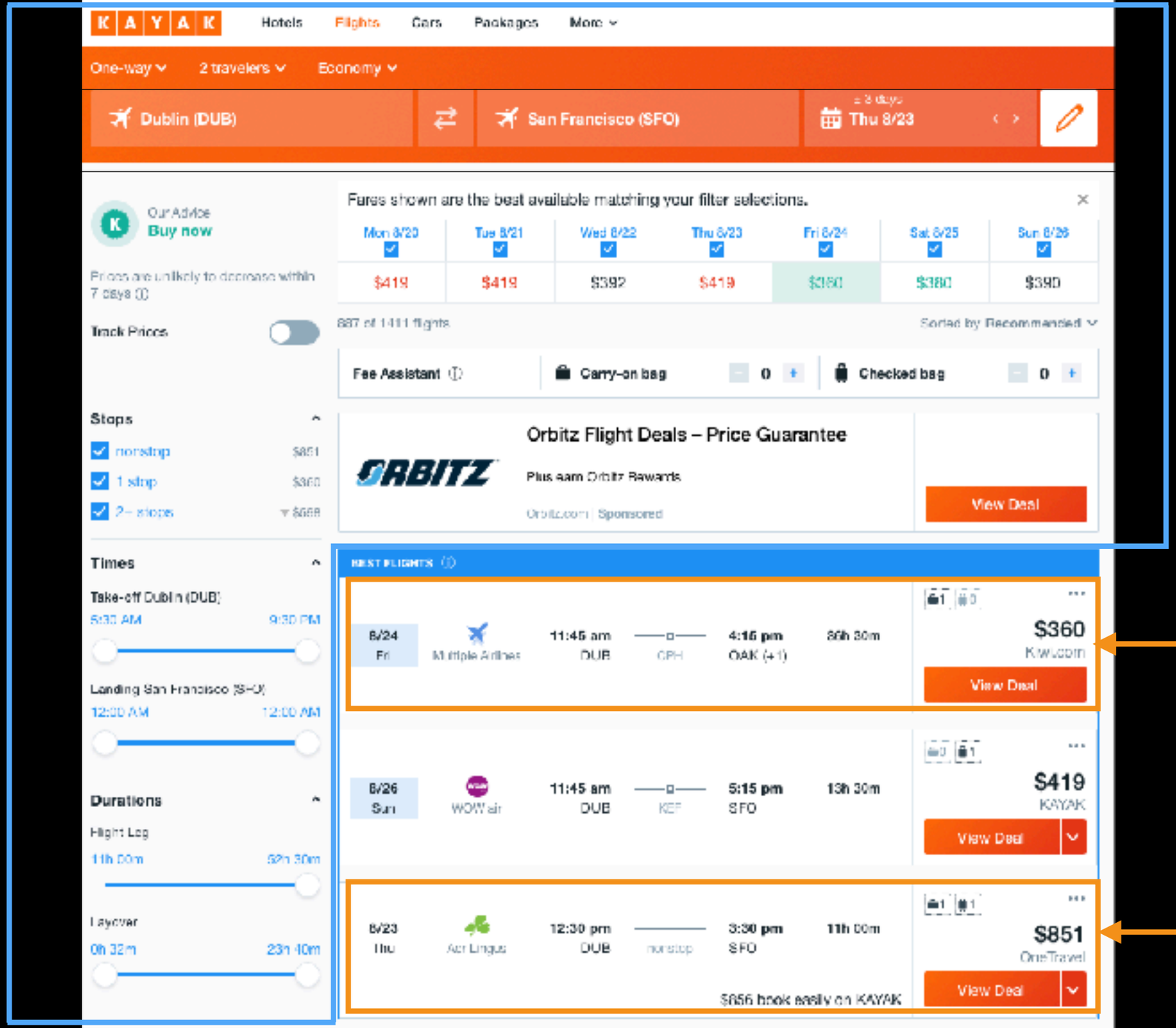


my website content

Content from Twitter added using Twitter API



Kayak website content

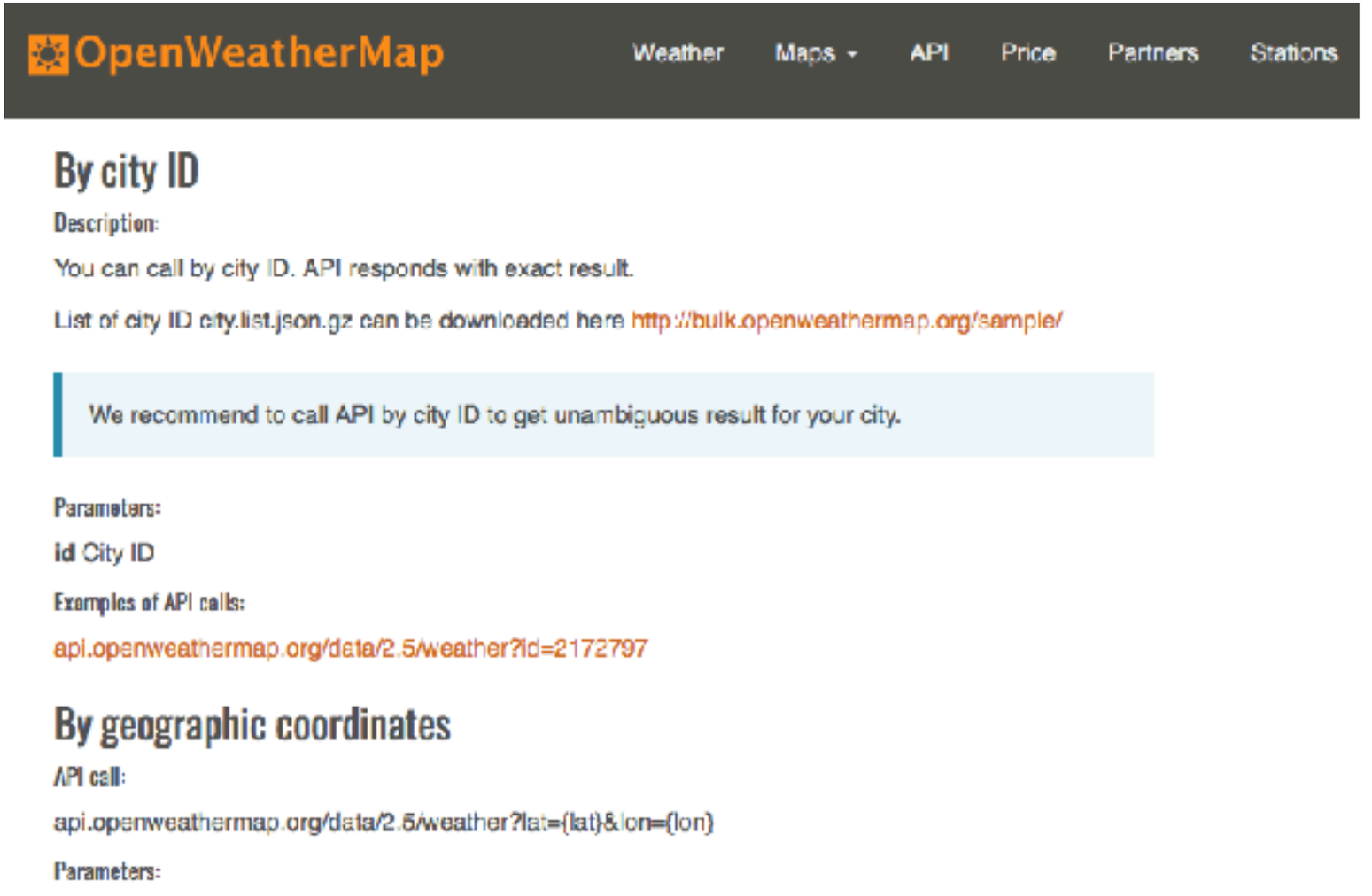


Content from kiwi.com using API

Content from OneTravel using API

WEB SERVICES

API = application programming interface



APIS IN THE REAL WORLD

- Most APIs are unique, like separate languages
- APIs for
  - devices (iPhone)
  - operating systems (macOS)
  - JavaScript libraries (jQuery API)
  - services (Slack)

WEB SERVICES

ENDPOINTS

- Addresses (URLs) that return data (JSON) instead of markup (HTML)

By city ID

Description:

You can call by city ID. API responds with exact result.

List of city ID city.list.json.gz can be downloaded here http://bulk.openweathermap.org/sample/

> We recommend to call API by city ID to get unambiguous result for your city.

Parameters:

id City ID

Examples of API calls:

api.openweathermap.org/data/2.5/weather?id=2172797

By geographic coordinates

API call:

api.openweathermap.org/data/2.5/weather?lat={lat}&lon={lon}

Parameters:

lat, lon coordinates of the location of your interest

Examples of API calls:

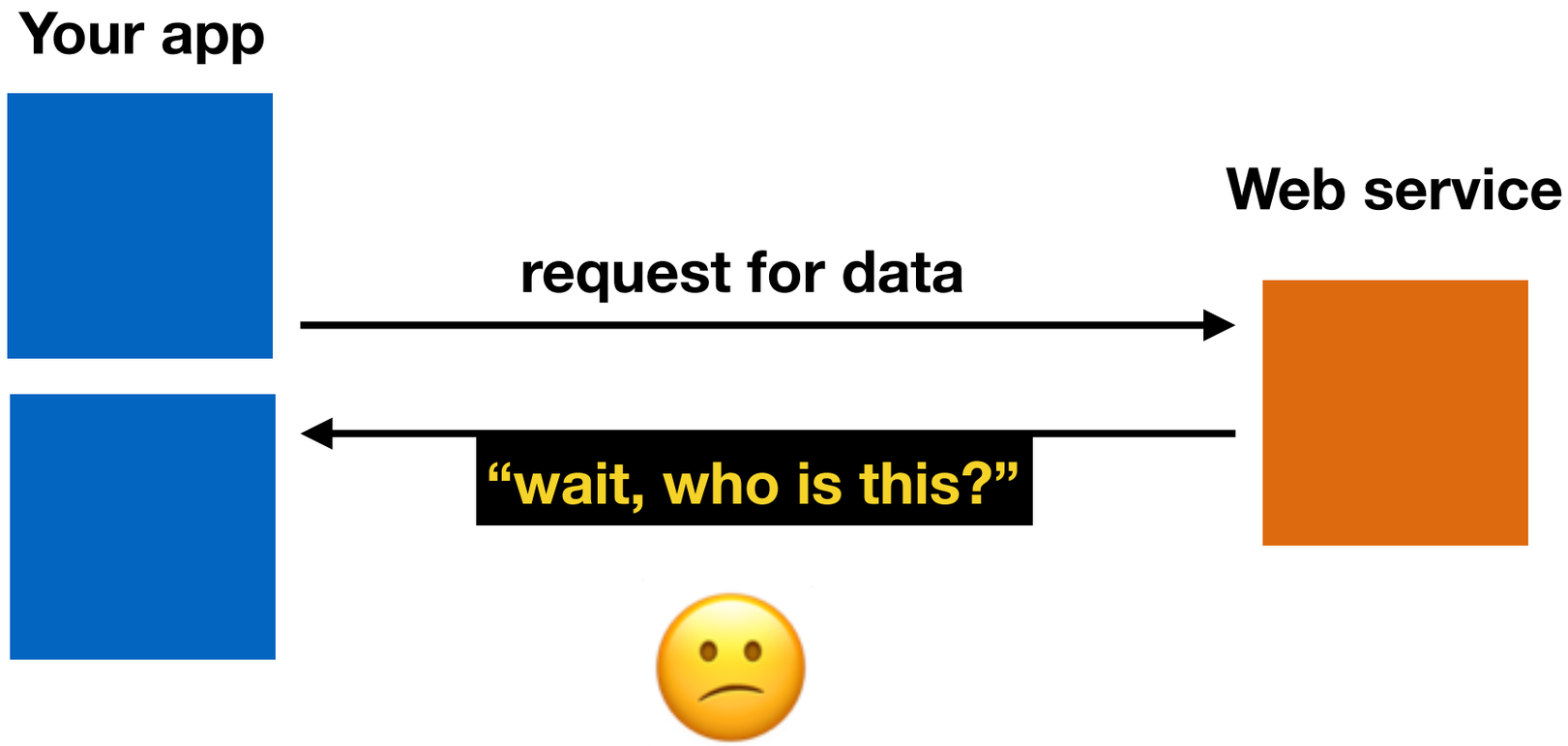
api.openweathermap.org/data/2.5/weather?lat=35&lon=139

API respond:


```
{"coord":{"lon":139,"lat":35},
"sys":{"country":"JP","sunrise":1369769524,"sunset":1369821049},
"weather":[{"id":804,"main":"clouds","description":"overcast clouds","icon":"0
4n"}],
"main":{"temp":289.5,"humidity":89,"pressure":1013,"temp_min":287.04,"temp_max
":292.04},
"wind":{"speed":7.31,"deg":187.002},
"rain":{"3h":0},
"clouds":{"all":92},
```

WHAT WE NEED TO KNOW TO USE AN API

AN API MIGHT REQUIRE AUTHENTICATION

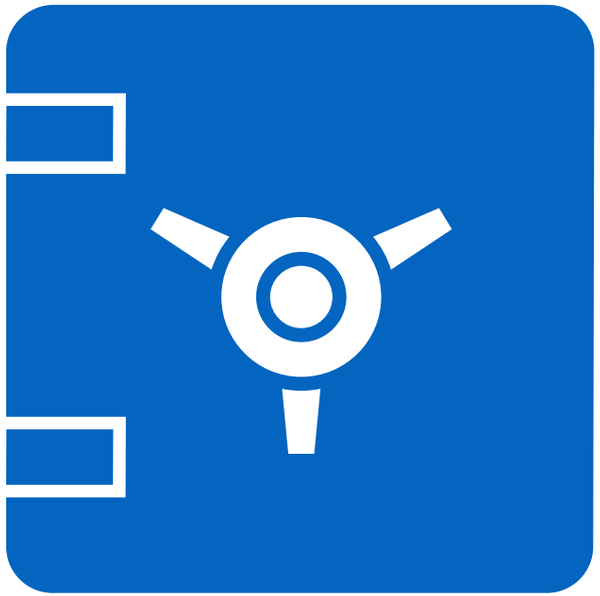


API KEY

- unguessable character string
- connects your requests to your account

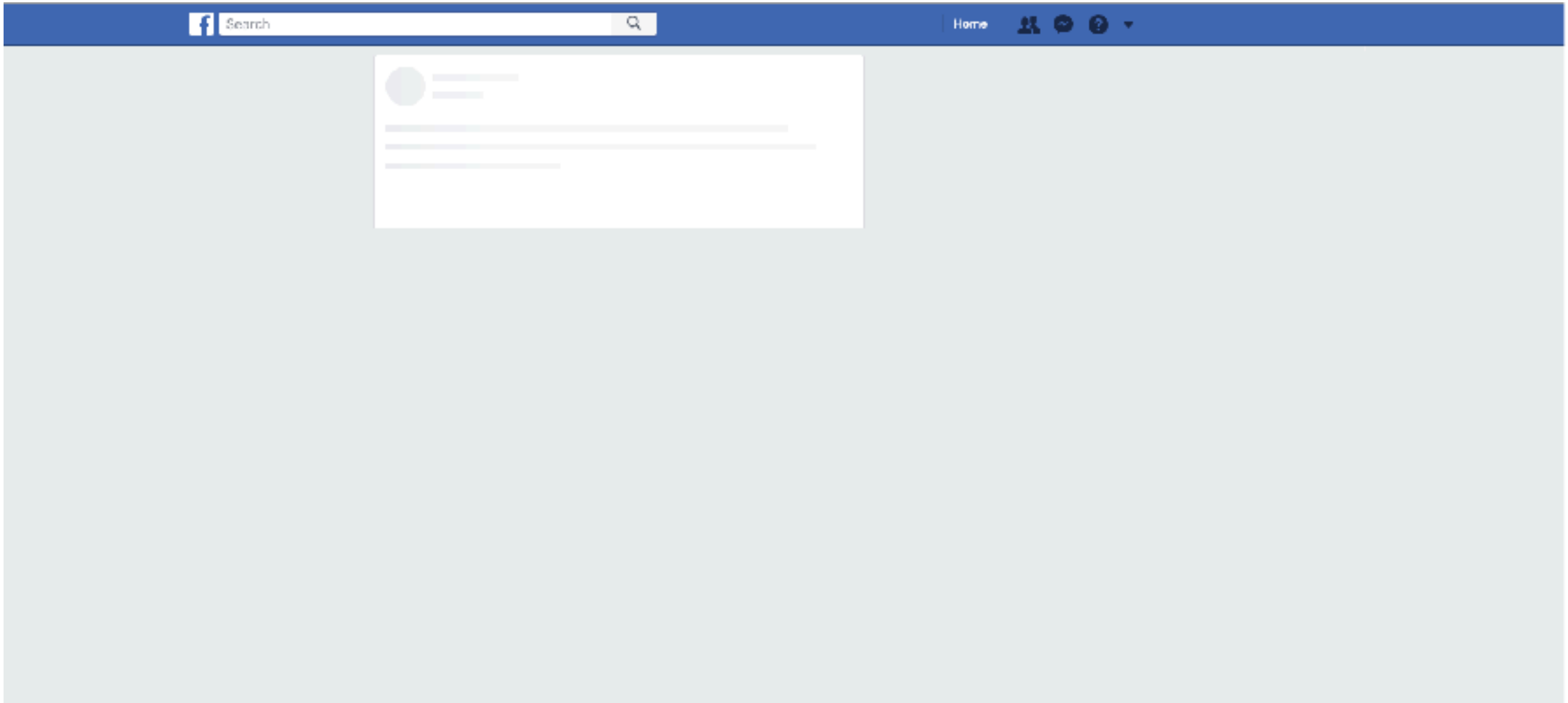
API REQUEST WITH AUTHENTICATION

KEEP YOUR API CREDENTIALS PRIVATE



- Don’t post to a public code repo
- Don’t share with other developers outside of your organization

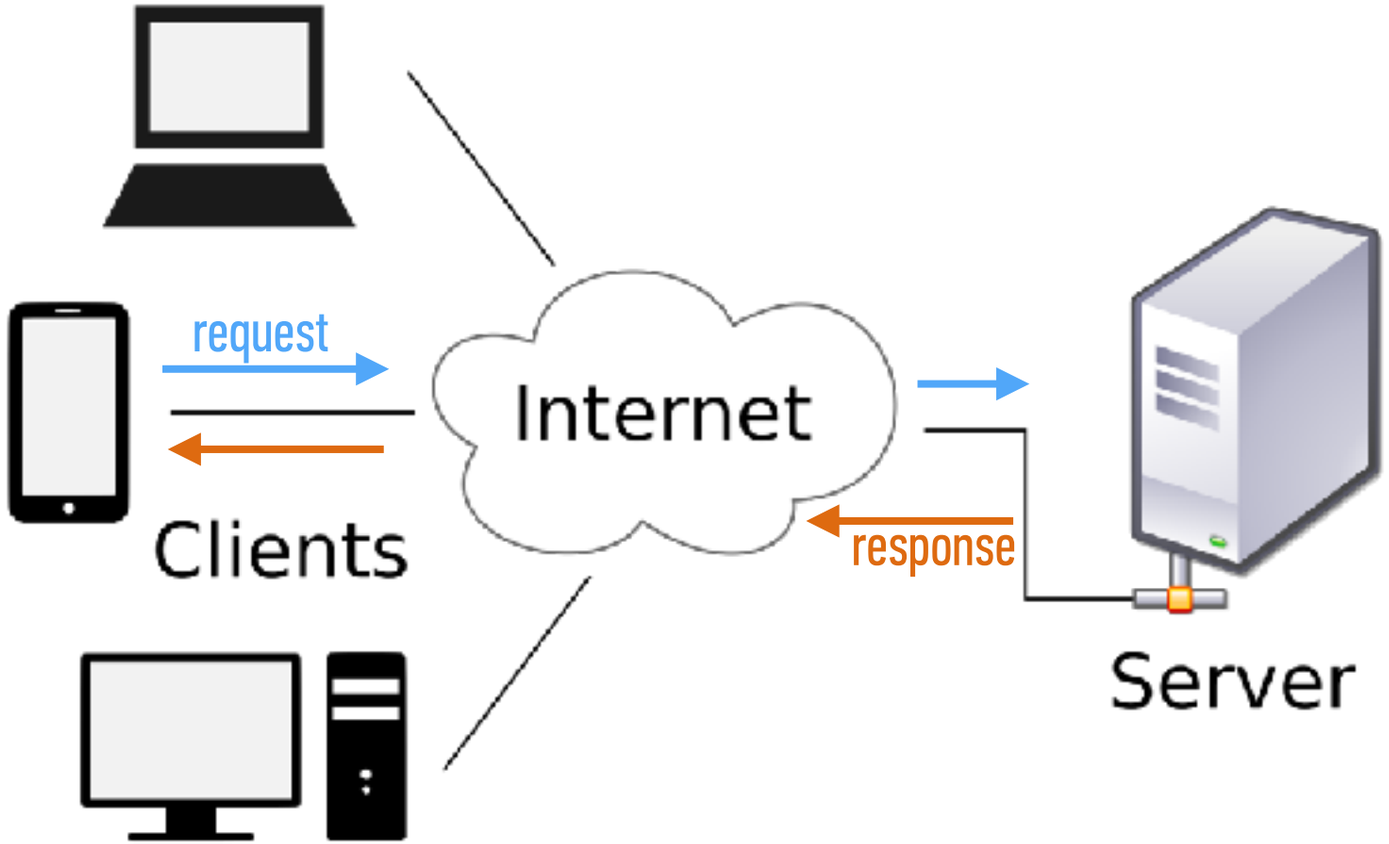
YOUR APP MIGHT EXPERIENCE A DELAYED RESPONSE



YOUR REQUEST MAY RESULT IN AN ERROR

REST (representational state transfer)

- architectural style of web applications
- transfers a representation of the state of a resource between the server and the client



RESTful API

- adheres to REST architecture
- uses
  - a base URL
  - an Internet media type (such as JSON)
  - standard HTTP methods

By geographic coordinates

API call:

api.openweathermap.org/data/2.5/weather?lat={lat}&lon={lon}

Parameters:

lat, **lon** coordinates of the location of your interest

Examples of API calls:

api.openweathermap.org/data/2.5/weather?lat=35&lon=139

API respond:


```
{"coord":{"lon":139,"lat":35},
"sys":{"country":"JP","sunrise":1369769524,"sunset":1369821049},
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"rain":{"3h":0},
"clouds":{"all":92},
"dt":1369824698,
"id":1851632,
"name":"Shuzenji",
"cod":200}
```
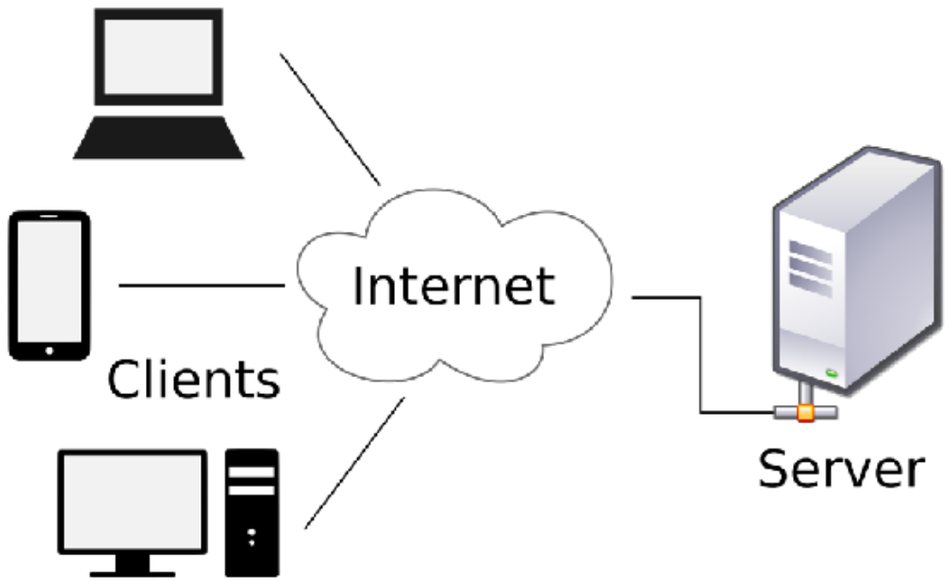

HTTP

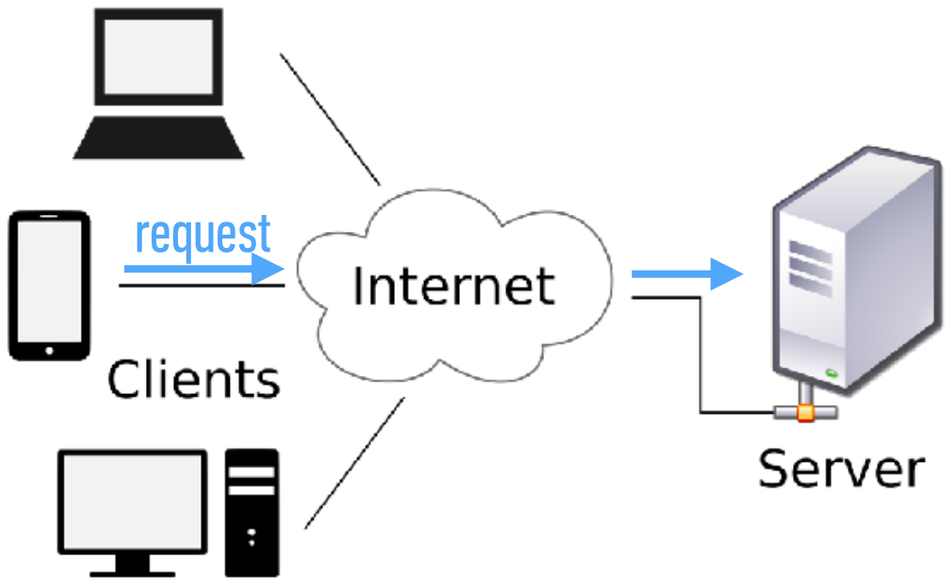
HTTP (hypertext transfer protocol)

- System of rules for how web pages are transmitted between computers
- Defines the format of messages passed between HTTP clients and HTTP servers



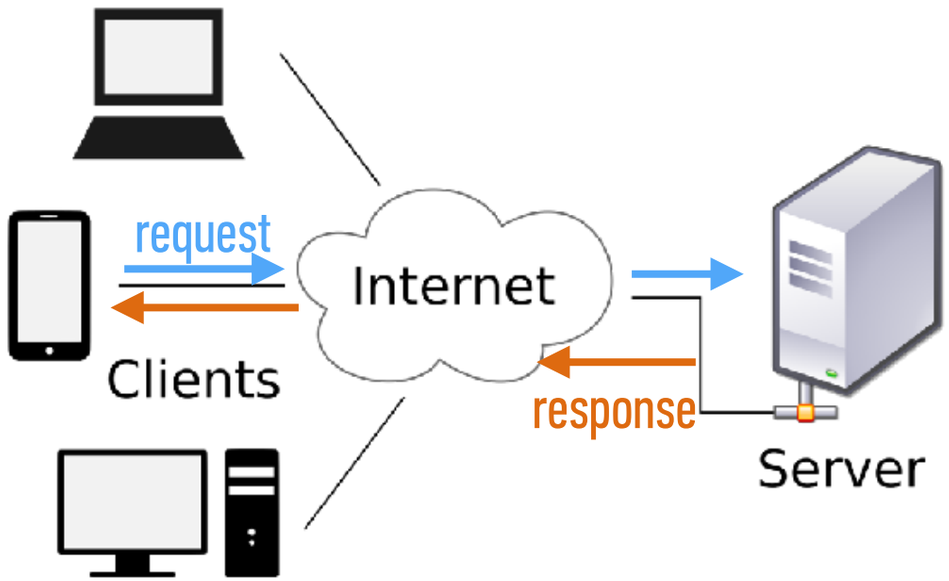
HTTP (hypertext transfer protocol)

- A client sends a **request** to a server.

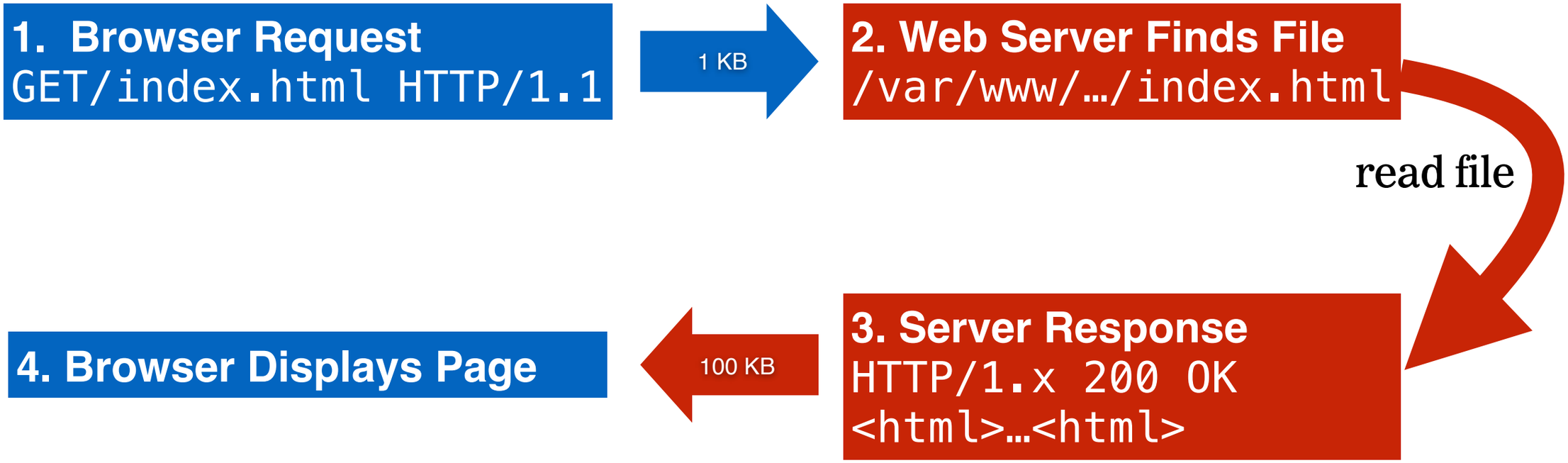


HTTP (hypertext transfer protocol)

- A server sends a **response** back to a client.



HTTP REQUEST AND RESPONSE



HTTP (hypertext transfer protocol)

HTTP client

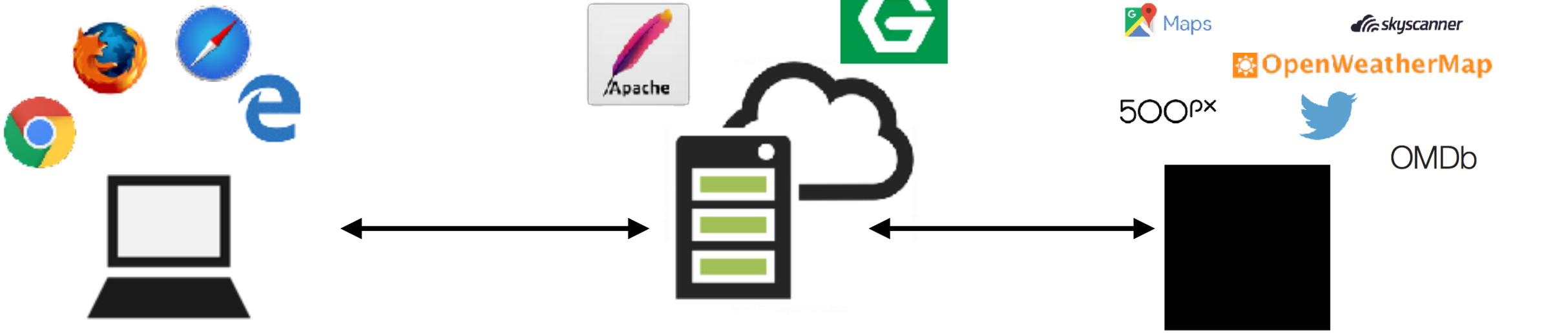
web browser

HTTP server

web server software

Web service

app that responds to HTTP requests

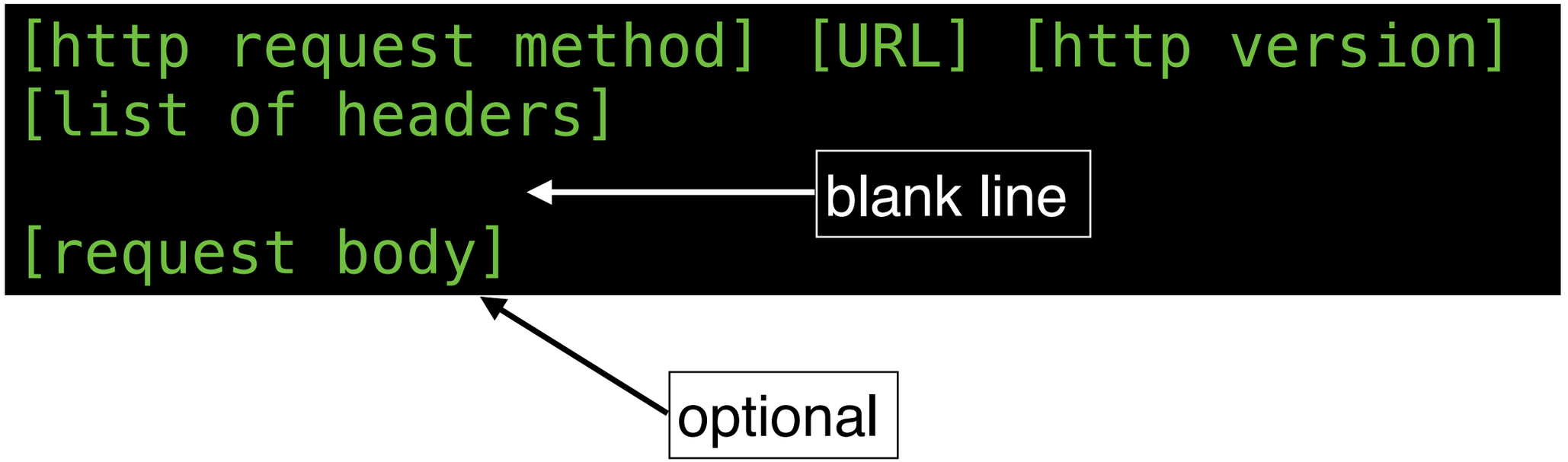


HTTP REQUESTS IN EVERYDAY LIFE

protocol host resource path query

```
https://www.domain.com/path/to/resource?a=b&x=y
```

HTTP REQUEST STRUCTURE

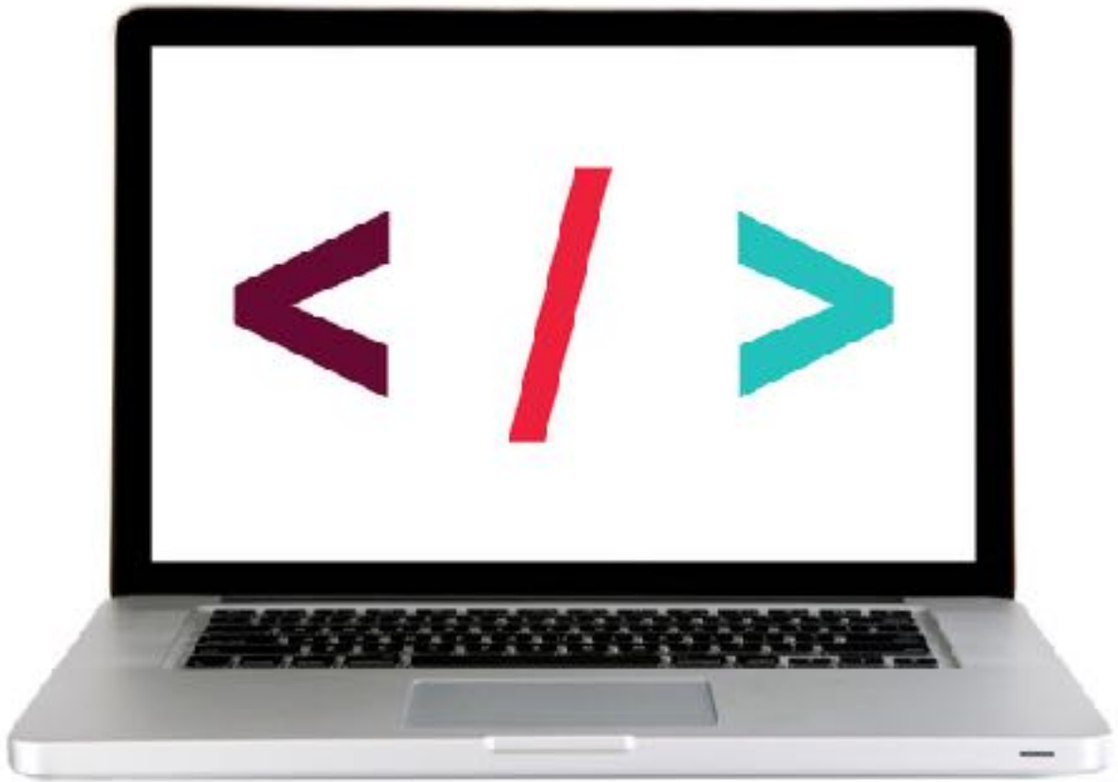


HTTP REQUEST METHODS ("HTTP VERBS")

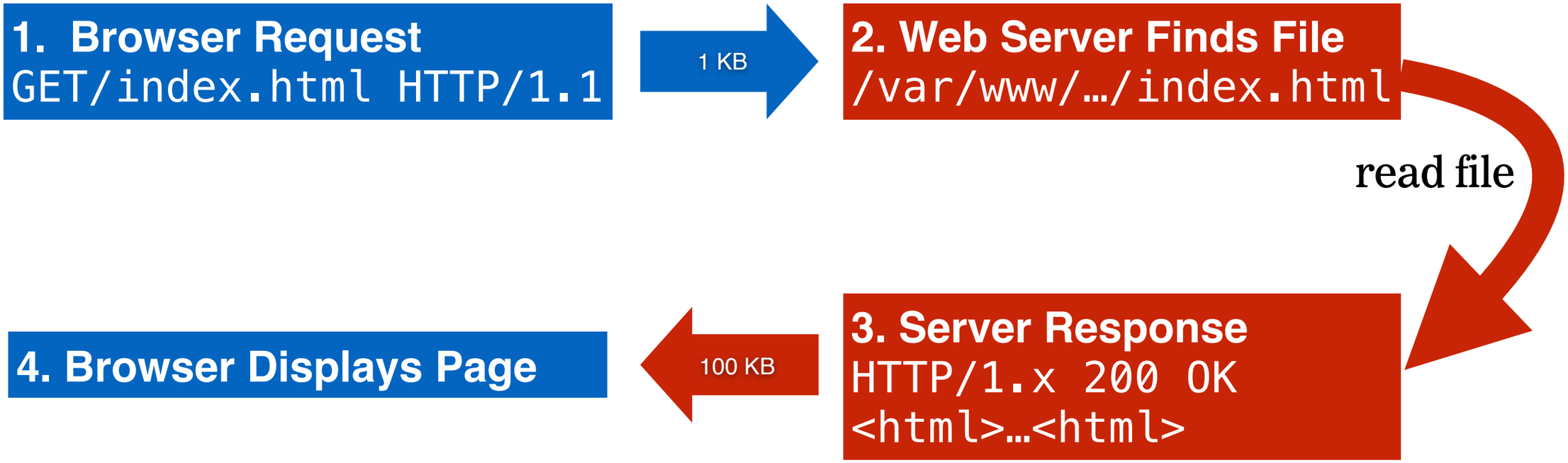
`GET`	Retrieve a resource
`POST`	Create a resource
`PATCH`	Update an existing resource (use instead of `PUT`, which replaces)
`DELETE`	Delete a resource
`HEAD`	Retrieve the headers for a resource

Most widely used

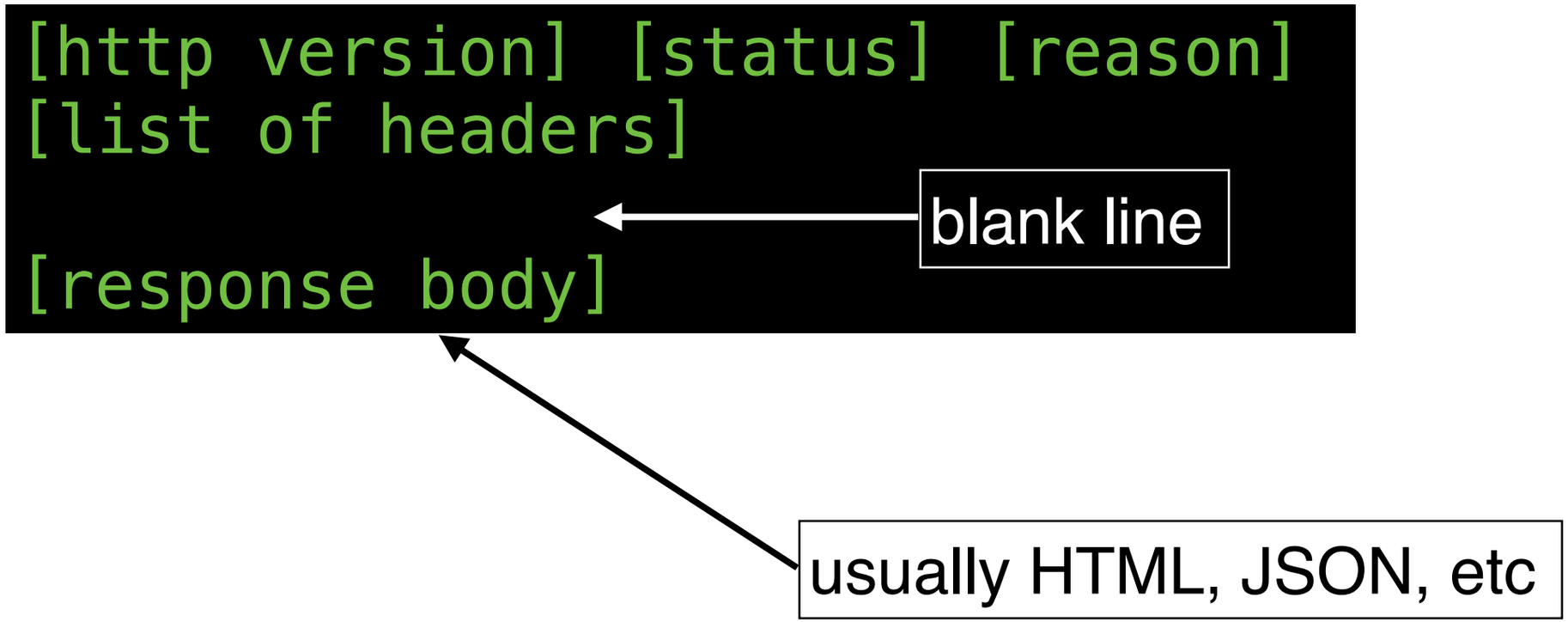
LET'S TAKE A CLOSER LOOK



HTTP REQUEST AND RESPONSE



HTTP RESPONSE STRUCTURE



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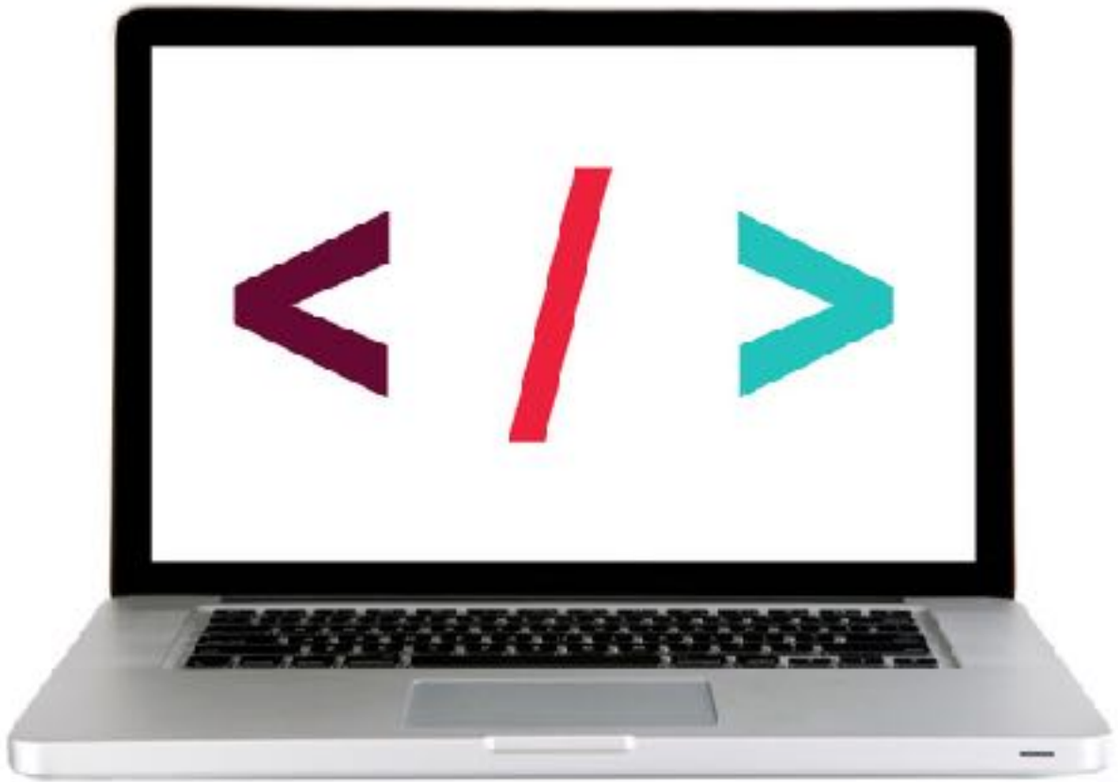
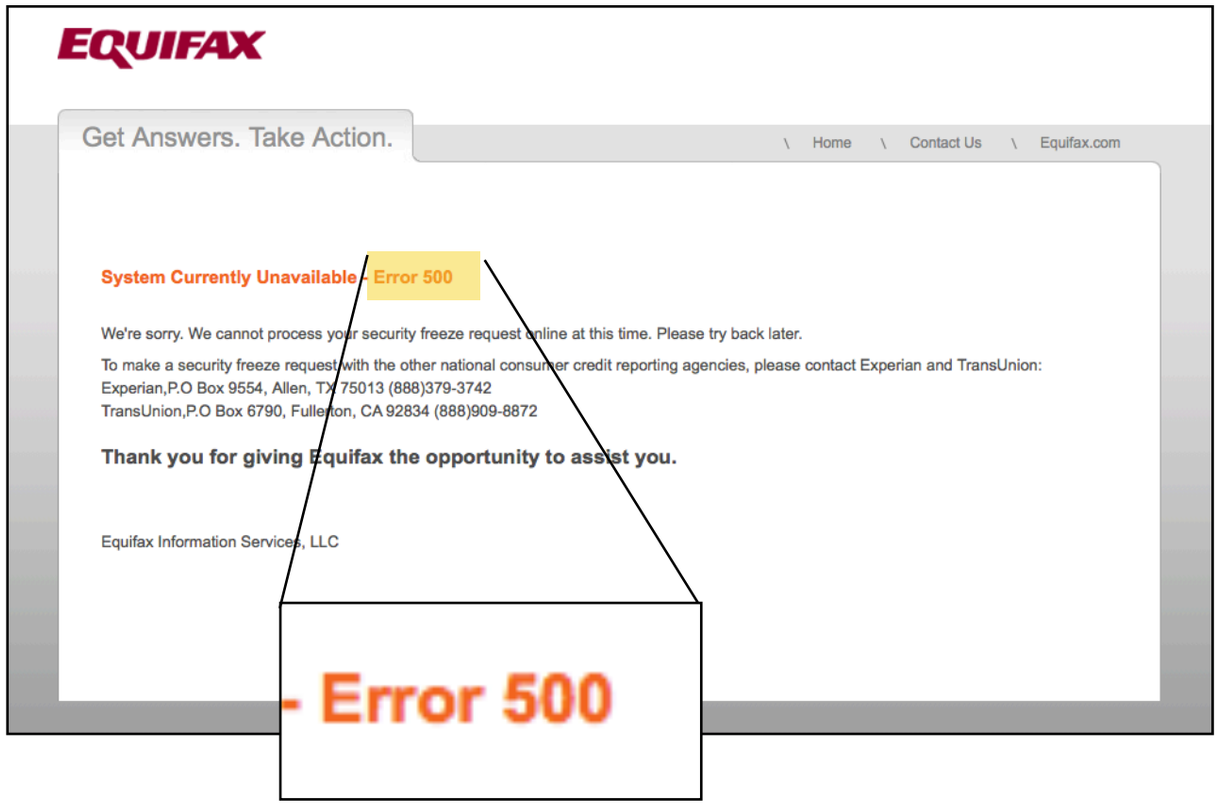
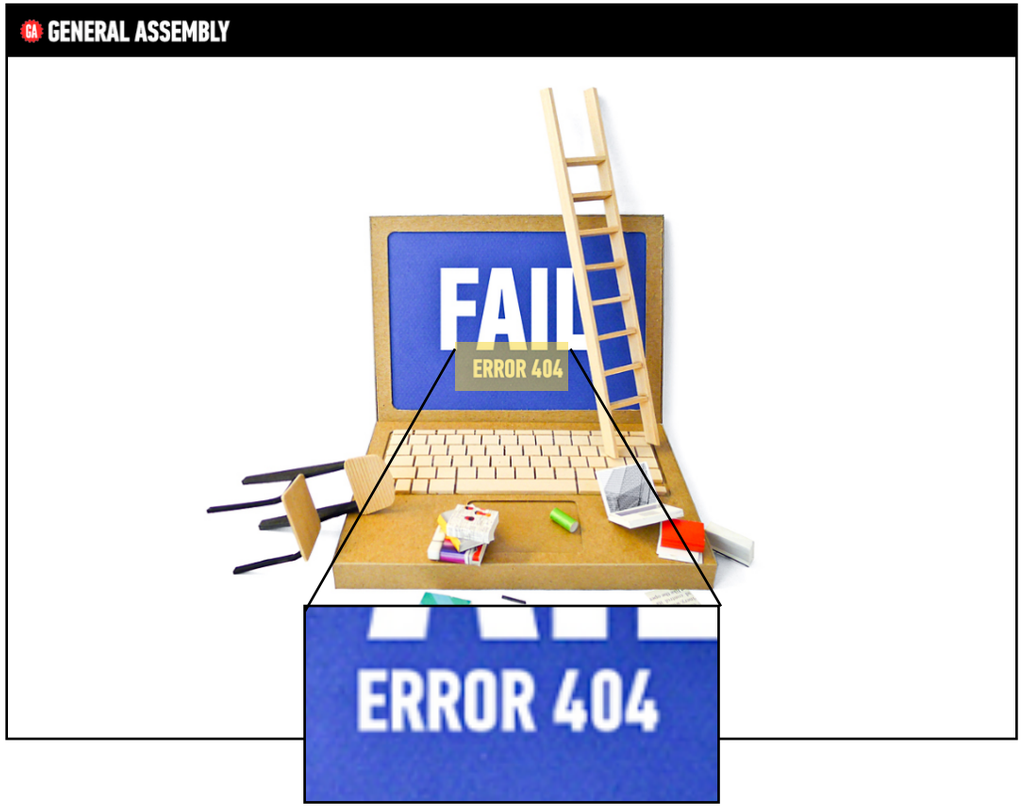


HTTP STATUS CODES

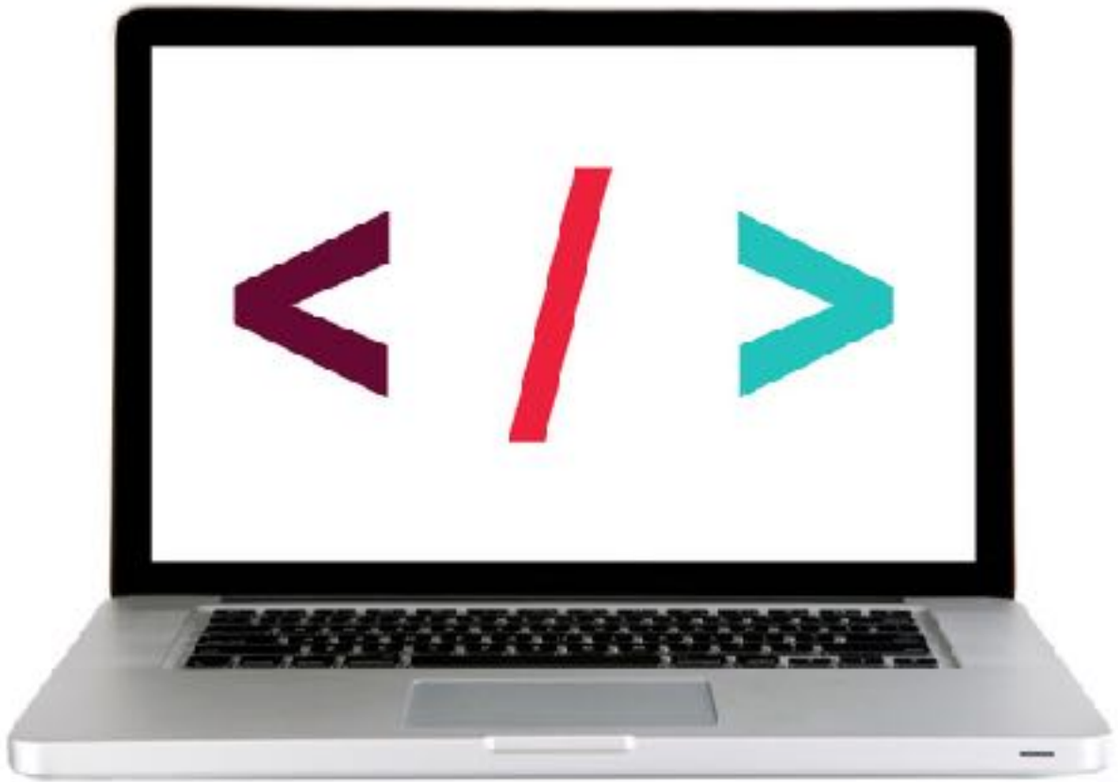




HTTP STATUS CODES

200	Okay
301	Moved permanently
302	Moved temporarily
400	Bad request
403	Forbidden
404	Not found
500	Internal server error

LET'S TAKE A CLOSER LOOK



Ajax

Ajax

A synchronous

J avaScript

A nd

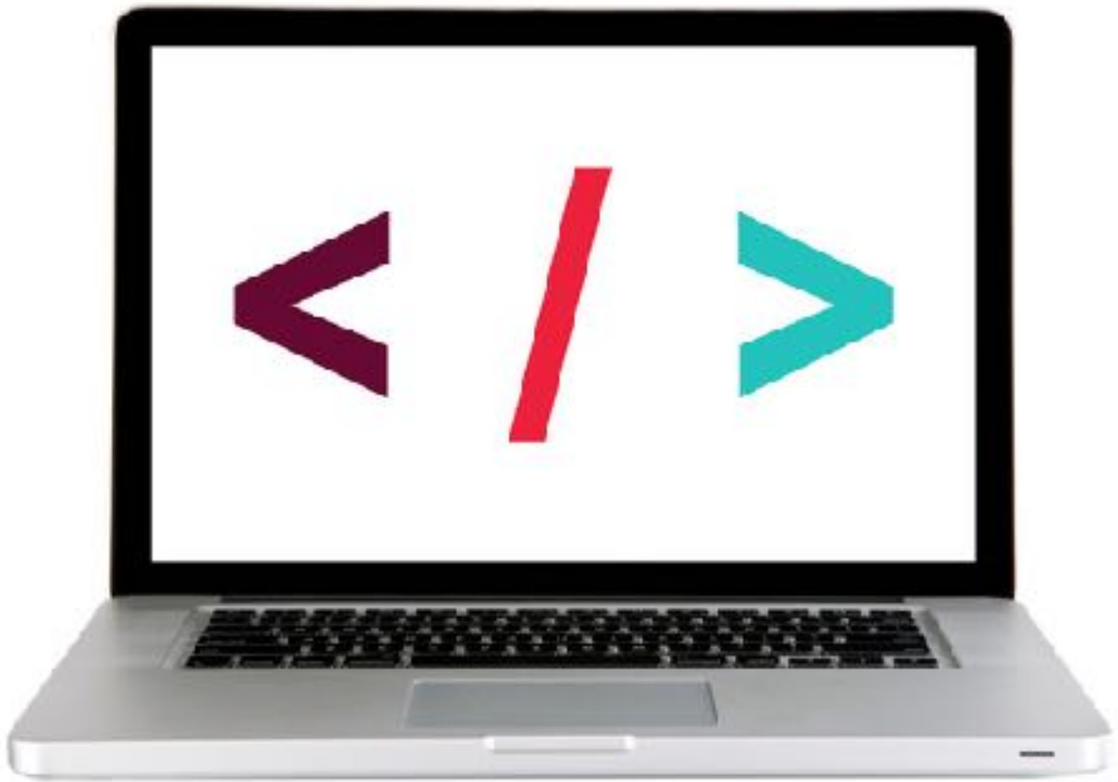
X ML **or JSON!**

Ajax in vanilla JS

Fetch = Ajax requests in vanilla JavaScript

```
fetch(url).then(function(response) {
  // check if request was successful
}).then(function(data) {
  // do something with the data
});
```

LET'S TAKE A CLOSER LOOK



EXERCISE - CREATING AN AJAX REQUEST

LOCATION

- `starter-code > 1-fetch-ajax-exercise`

TIMING

5 min

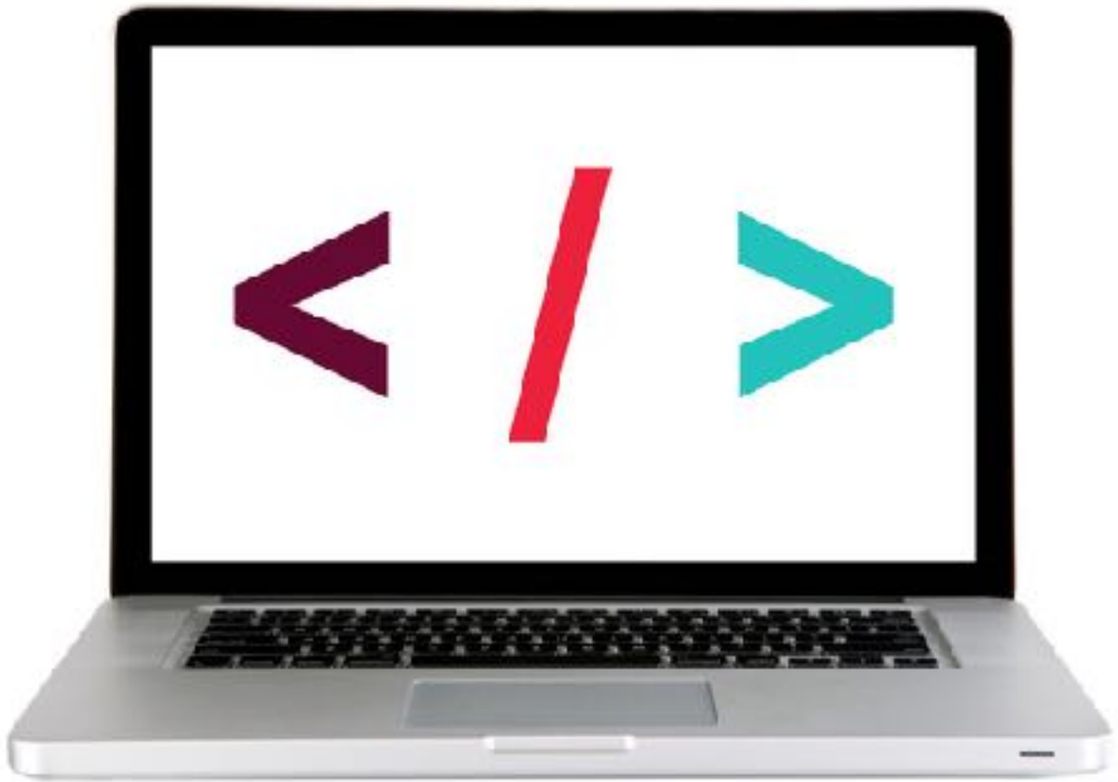
1. Copy the code from the codealong to the main.js file.
2. Change the URL to the one shown in the instructions.
3. Verify that a new set of results is shown in the console.
4. BONUS: Customize the error message to display the text of the HTTP status message.
   (Hint: look at https://developer.mozilla.org/en-US/docs/Web/API/Response/statusText)
5. BONUS: Refactor the code to work with user interaction. In the index.html file there is a "Get Health Data" button. Modify your code so data is only requested and logged to the console after a user clicks the button.

jQuery Ajax

Using Ajax with jQuery

method	description
`$.get()`	loads data from a server using an HTTP GET request
`$.ajax()`	performs an Ajax request based on parameters you specify

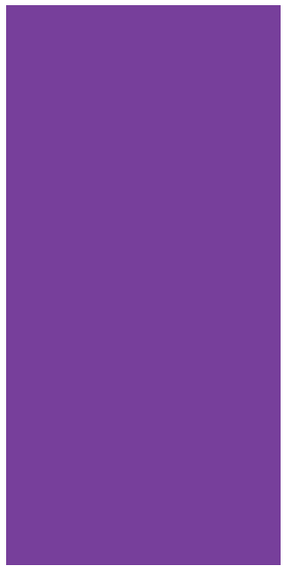
LET'S TAKE A CLOSER LOOK



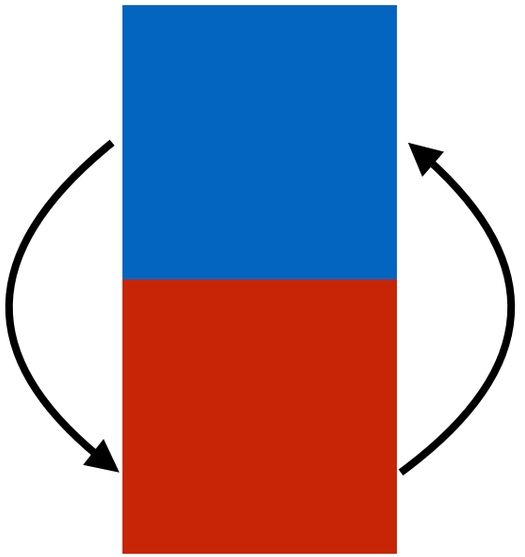
Code organization

SEPARATION OF CONCERNS

code for data and view intermingled



code for data

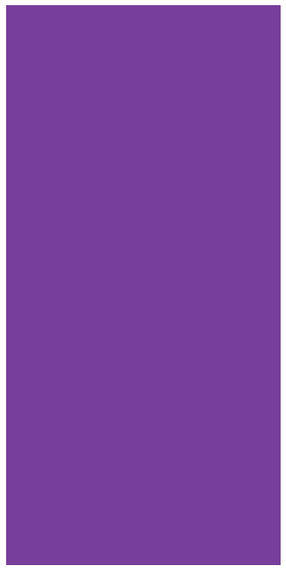


code for view

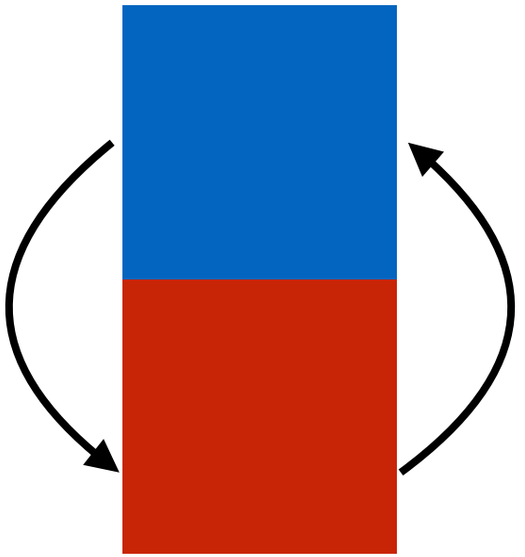
parts of code call each other, but are maintained separately

SEPARATION OF CONCERNS - HTTP

code for client and for HTTP requests intermingled



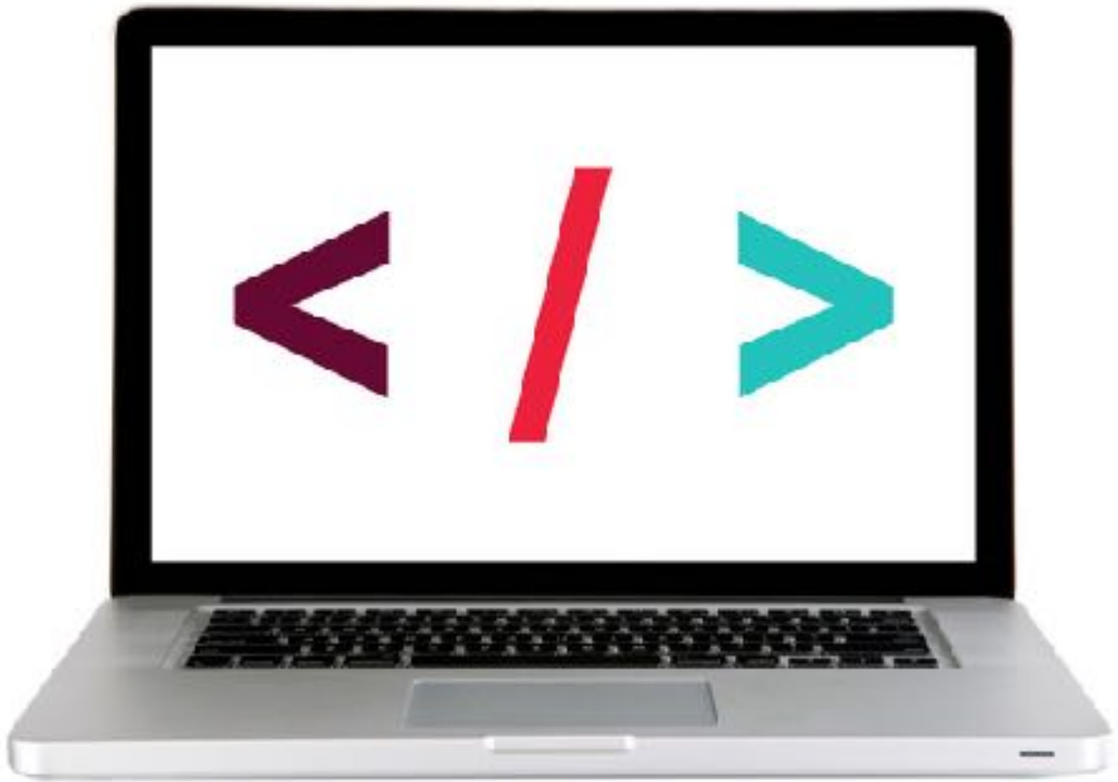
code for client



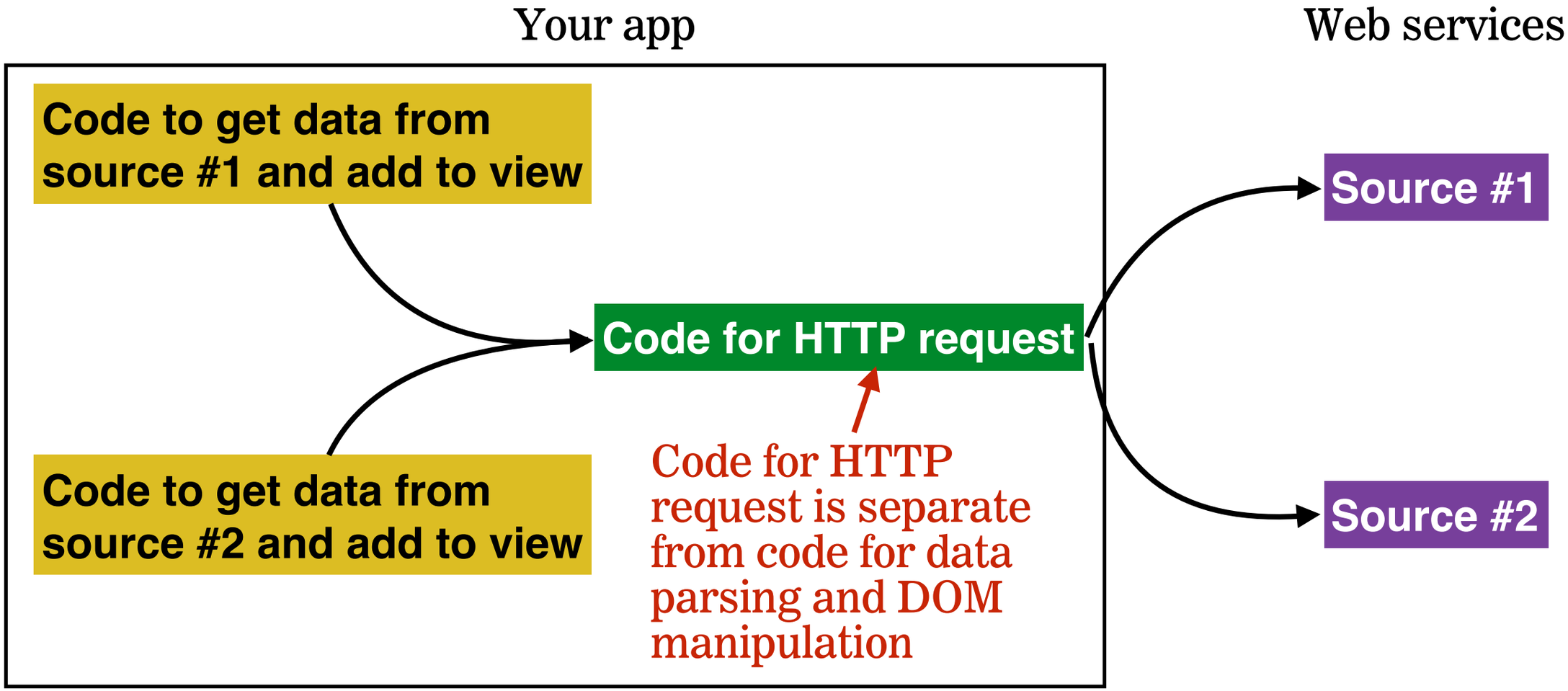
code for HTTP

parts of code call each other, but are maintained separately

LET'S TAKE A CLOSER LOOK



CREATING DRY CODE FOR HTTP REQUESTS



LAB — JQUERY AJAX

OBJECTIVE

- Create an Ajax request using jQuery.

LOCATION

- `starter-code > 4-jquery-ajax-exercise`

EXECUTION

until 9:20

1. Open index.html in your editor and familiarize yourself with the structure and contents of the file.
2. Open main.js in your editor and follow the instructions.

Exit Tickets!

(Class #10)

LEARNING OBJECTIVES - REVIEW

- Use event delegation to manage dynamic content in jQuery.
- Identify all the HTTP verbs & their uses.
- Describe APIs and how to make calls and consume API data.
- Access public APIs and get information back.
- Implement an Ajax request with vanilla JS.
- Create an Ajax request using jQuery.
- Reiterate the benefits of separation of concerns – API vs. Client.

NEXT CLASS PREVIEW

Asynchronous JavaScript and Callbacks

- Pass functions as arguments to functions that expect them.
- Write functions that take other functions as arguments.
- Return functions from functions.

Q&A