CSC 309
The Big Picture

- Client sends HTTP request to server

- How?

```
                              GET path/to/route
Server              ◄─────    Host: example.com    ◄─────    Client
```

- Client sends HTTP request to server

- How?

    - Ajax call (button click or other event)

    - Type in a URL in browser

    - Curl/Postman

    - Link

    - Form submit

Server

- What is the server?

Server

- What is the server?

  - A running process listening for TCP socket connections on a published port (usually 80)

  - It unpacks the HTTP message, determines what to do with it, and sends a response.

Server → `HTTP/1.1 200 OK` → Client

- Response?

- Status?

Server

- Main task of the server is to…

Server

- Main task of the server is to satisfy requests from the client

  - Static files: html, css, javascript, images

  - Dynamically generated HTML

  - Dynamically generated data

- Server Technologies:

- Server Architecture:

- Value of a framework?

- Server Technologies:

  - Node: event loop JavaScript engine

  - Express: minimalist framework

- Server Architecture:

  - route/controller: determine how to handle a request

- Value of a framework

  - Encapsulate common operations in a library
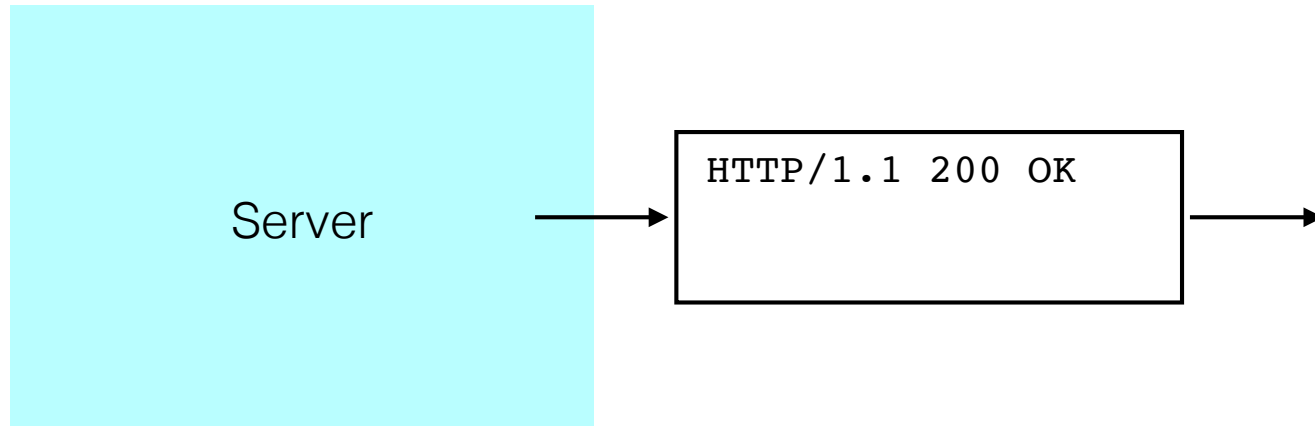
  - Enforce/encourage a structure

- Server technologies

    - Also need a place to store data persistently

    - Database

        - Relational

        - NoSQL

    - CRUD: Create Read Update Delete

Server

```
HTTP/1.1 200 OK
```
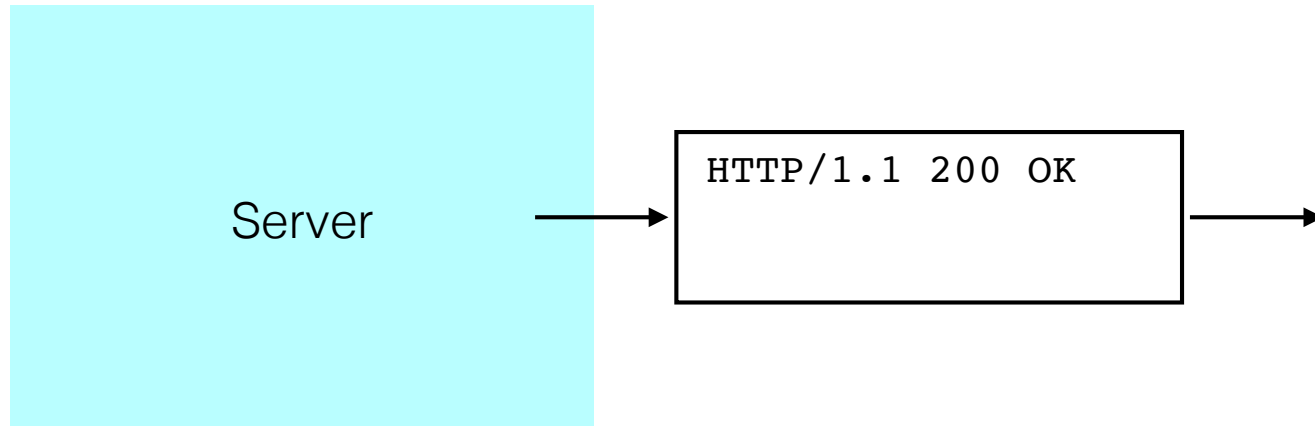
- Constructs a response

  - Status message:
    - 2xx Success
    - 3xx Redirection
    - 4xx Client error
    - 5xx Server error

Server

HTTP/1.1 200 OK
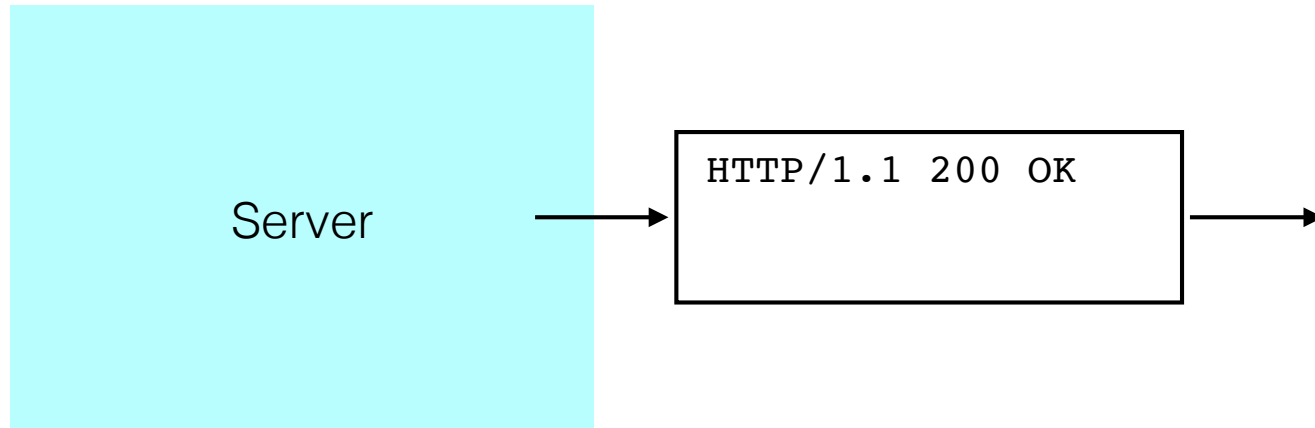
- Sends back data - type?

```
Server                    HTTP/1.1 200 OK
```
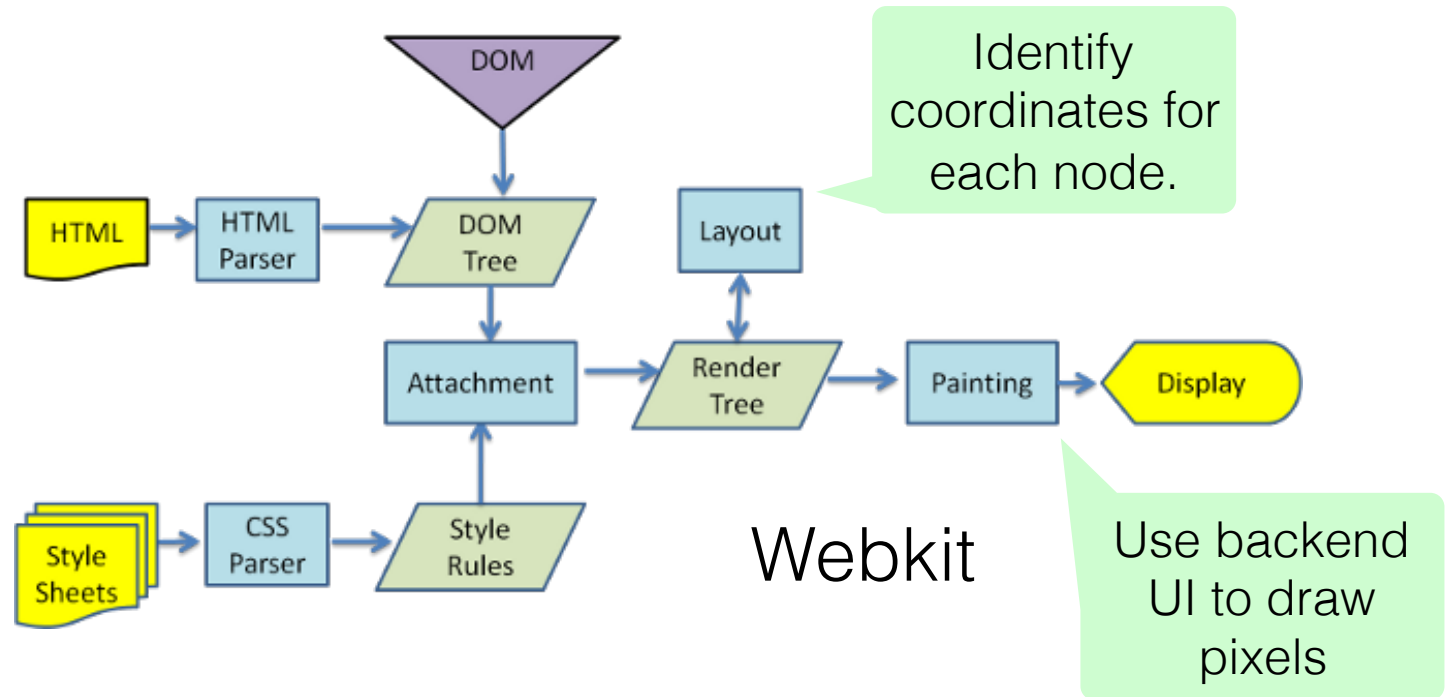
- Sends back data

  - ContentType:
    - Text
    - XML
    - JSON
    - HTML

Browser

- Browser displays the resource you requested

- How?

- What is the DOM?

- DOM is the data structure that results from parsing the HTML

- The DOM is combined with CSS rules to form the render tree for painting

- HTML

  - Mixture of semantic and layout information

  - Hierarchical structure matches the DOM

  - Elements, attributes

  - Forms

- What is HTML?

- How does it relate to the DOM?

- What is CSS? (How does it work?)

- How is Javascript used in the browser?

- Javascript: constructing DOM nodes dynamically

- Common operations:

  - construction and combining DOM nodes

  - listen for and respond to events

- What is Ajax?

- Ajax

  - once we have events, we need a way to update data

  - **fetch()**   - JavaScript

- Sends an HTTP request to the server, but doesn't require that the whole DOM be re-rendered

Final Exam

- No aids allowed

- Some programming - vanilla JavaScript

- Short answer type questions

- Some code reading

- Comprehensive

Topics

Browser

- HTML5

- CSS

- DOM

Javascript

Server

- Node

- Express

- MongoDB/Mongoose

- Validation

- JSON

Topics

- Communication

  - HTTP

  - GET, POST, PUT, DELETE

  - Sessions, Cookies

  - AJAX

  - JSON

- Security

- Promises

Thank You and Good Luck!