Web Development 101

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A little about me

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- Graduated from UPenn NETS program this Spring
- A current PhD student working on data systems at MIT
- Instructor of CIS 197: Javascript for two years

What you are going to learn

- Basics of website architecture
- How to build a basic, functional, full-stack website

Structure

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- 10% slides + 90% live coding
- Goal: try to build something that's *close* to penncoursereview.com

Getting started
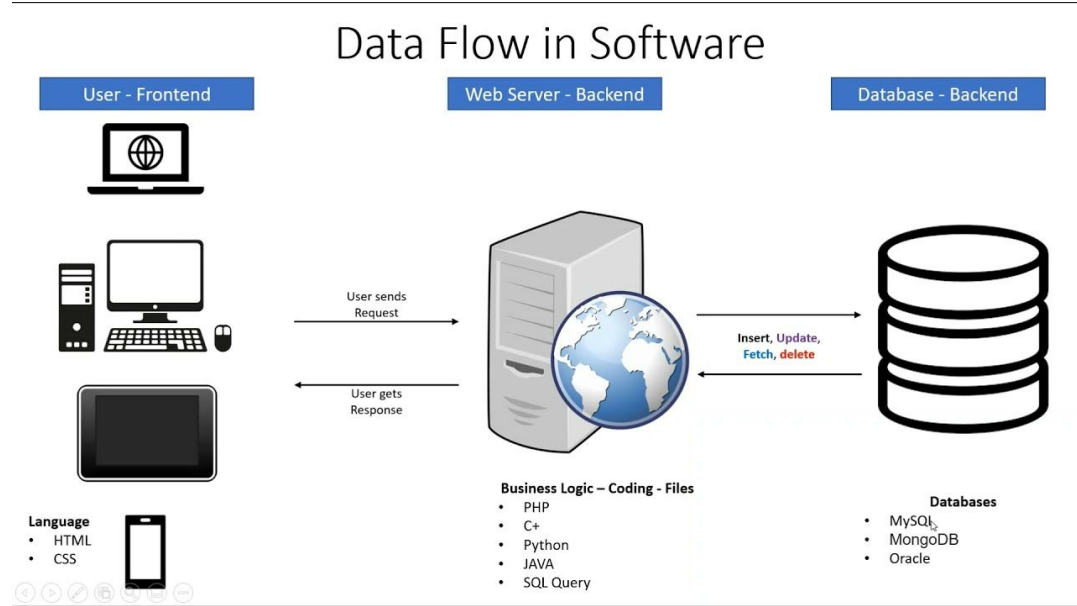
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- Install nodeJS and npm: https://nodejs.org/en/download/ →
  verify after installation
- Use any editor (VS Code is a popular option)
  - But even the most basic text editor would work
- Use Github for version control (think of Github as the
  google drive but for code)

Website architecture

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- Frontend
- Backend
- Database

Data Flow in Software

| User - Frontend | Web Server - Backend | Database - Backend |

User sends Request

User gets Response

Insert, **Update,** **Fetch, delete**

Language
- HTML
- CSS

Business Logic – Coding - Files
- PHP
- C+
- Python
- JAVA
- SQL Query

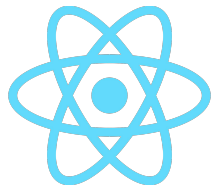**Databases**
- MySQL
- MongoDB
- Oracle

Frontend

MAGIC

Overview

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- Everything on a webpage that you can interact with is frontend → includes all visual elements
- It's a lot of magic, so don't be afraid to experiment a lot

React

- React is a very popular frontend framework
- **Component**
- **Component**
- **Component**
- Think of HTML Tree… (developer console)

ParcelJS + React

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- Parcel is a package that lets you set up React easily without using the bulky `create-react-app`
- https://parceljs.org/getting-started/webapp/
- https://parceljs.org/recipes/react/

PARCEL

Backend

Much less magical than frontend

Client-Server model

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- Client sends API requests to servers
- Servers respond with information

Express

Express

- A very popular JS backend package that lets you start a server extremely fast
- Get started
- Parse JSON input

CORS

- Cross origin resource sharing
- CORS error occurs when one domain is making an API request to <u>another</u> domain and this other domain is not configured to accept such request
- Solution: simply enable CORS
  https://expressjs.com/en/resources/middleware/cors.html

Database

Overview

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- Permanent storage
- Made up of records

```
[

    {"Name": "Peter", "Age": 21},

    {"Name": "Eric", "Age": 22}

]
```
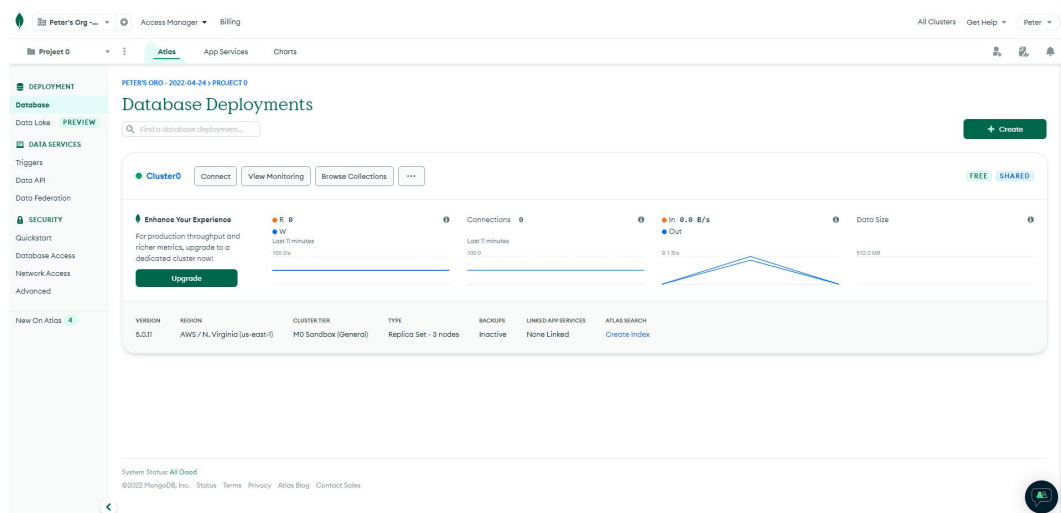
MongoDB

- A non-relational database
- Create free DB using MongoDB atlas
- A giant key-value/ JSON store (which fits well with JS)

Mongoose Concepts

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- MongooseJS is used to interact with MongoDB
- Schema: defines the attributes of a record
- Model: constructor that supports different operations

Thank you!

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- https://github.com/peterbaile/pennapps
- Contact me if you have any questions :)