CS142 - Web Applications

http://cs142.stanford.edu

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Today: CS142 FAQ

- What is this course about?
- How is my course grade determined?
- Who is teaching the course?
- How do I communicate with the course staff?
- What kind of programming projects will I have do?
- What kind of computing environment do I need?
- Do I need to buy a textbook?
- Are the course lectures record on video?

Course is about Web Applications

Technologies used to **build** modern web applications

Note: CS14x (computer systems course in Computer Science department)

Full stack: Browser ⇔ Web server ⇔ Storage system

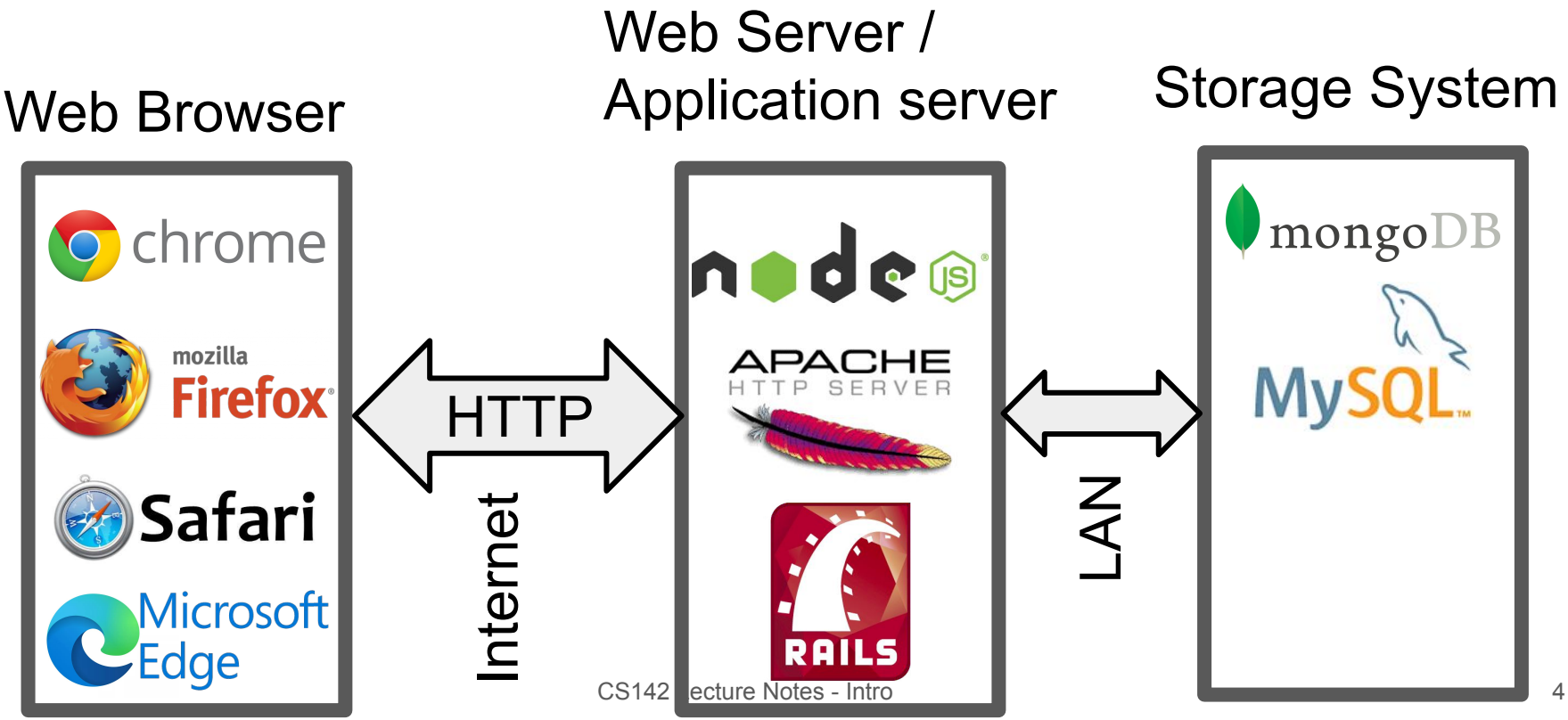
Learning Goal: Learn how a web application is built and run

How to build a web application - learn by doing:

Use MERN stack (React.js, Node.js, Express.js, MongoDB)

Learning Goal: Build a photo sharing web app and understand how it works!

Full Stack Web Application Architecture



CS142 Technologies and Concepts

Browser environment:

- HTML/CSS/JavaScript - Markup, separation of content & style, reuse, scripting
- Document object Model (DOM) - Document structure

Browser software:

- Model View Controller, Single page applications, Responsive design - React.js

Backend communication:

- API design - HTTP/AJAX/REST/GraphQL
- Cookies/Sessions/State management - Storage/Trust

Backend implementation:

- Web Server - HTTP request processing - Node.js
- DBMS - Schema, Objects, CRUD, indexes, transactions - MongoDB
- End-to-End - Scale and Security

Grading

55% Projects - 8 projects (Due on Thursdays - First due 1/16, last due 3/12)

Projects 1-4: Learn technologies in front-end: HTML/CSS/React.js

Projects 5-8: Building a Photo Sharing App using React.js/Node.js/MongoDB

Later projects worth more and take more time

15% Midterm Exam - **Wednesday, February 12, 7:30pm – 9:00pm**

Closed book, with limited note pages

30% Final Exam - **Monday, March 16, 3:30pm – 6:30pm**

Closed book, with limited note pages

Note: First day of the End-Quarter examination period

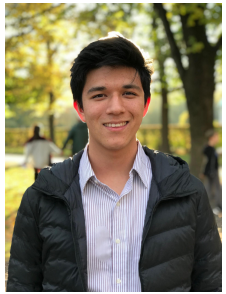
Course Material and Grading

- CS142 is different from introductory programming class
- Lectures cover many more concepts than are addressed in the programming projects
  - Lecture focused on concepts, not directly helping with project coding
- Exams focused on concepts presented in class but not used in projects
  - Possible to do well on all the projects and not get an A in the class
  - Need understanding beyond "magic incantations"

Course Staff

Instructor: Mendel Rosenblum (mendel@cs.stanford.edu)

Course Assistants (cs142-win1920-staff@lists.stanford.edu)



James Carroll

Jeff Woo

Ben Anderson

Amy Chen

Course Communication

1. Piazza - https://piazza.com/stanford/cs142

   Good for questions/comments where everyone can see the reply

   Can also posts privately to course staff (Use for post containing code)

2. Email - cs142-win1920-staff@lists.stanford.edu

   Good for private communication with the course staff (CAs and myself)

3. Mendel Rosenblum - mendel@cs.stanford.edu

CS142 Course Project Evolution

Largely driven by trends in industry

Cs142 started in Winter 2009: Ruby on Rails with a SQL relational database

Winter 2016: CS142 switched projects to the MEAN stack

- AngularJS - JavaScript-based browser framework for apps
- Node.js - JavaScript-based server engine
- MongoDB - An object database

Spring 2019: CS142 switched projects to the MERN stack

- React.js/Node.js/MongoDB
- Component-focused JavaScript-based framework (Similar to Vue.js/Angular)

Project details

1. HTML & CSS
2. JavaScript
3. Browser Document Object Model (DOM)
4. Learn React.js - Single page application
5. Photo Sharing App
6. Backend server - Node.js and MongoDB
7. Sessions state and validation
8. Photo App Scrumboard

Discussion sections will be scheduled on Friday, Monday, and Tuesday.

No need to enroll. You can attend any section

Class software requirements

- A modern web browser

  Chrome is strongly suggested, Internet Explorer (IE) is strongly discouraged

- Node.js

  Installs fairly easily on modern OS environment (Linux, MacOS, Windows)

  npm (in Node.js install) is used for fetching assignments and dependencies

- MongoDB

  Easy to install (for a DBMS) on modern OS environments

Stanford Honor Code

We want you to do the projects individually

Questions?