Web application

CS142 - Web Applications

http://cs142.stanford.edu

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CS142 - Pandemic Edition

- No in-person meetings
  - All meetings (lectures, sections, office hours) will be done using Zoom meetings
  - Lectures and sections will be recorded for asynchronous viewing
- No traditional end of the quarter final exam and "dead week"
  - Exams replaced with 3 timed online quizzes taken in specified 24-hour windows
- Newish experience for all us: Suggestions/feedback welcome!

Lectures and discussion sections via Zoom Meeting

- Questions are welcome!
- Question asking protocol suggestions:
  - Ask via chat message
  - Raise hand on Zoom
- Course staff will monitor the chat message and participate hand raising
- Zoom meetings will be recorded and available via Canvas site
  - 1st week "shopping" period: Anyone with a Stanford account can view
  - Rest of the quarter: Anyone taking or "auditing" the class

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 recorded?

Course is about Web Applications

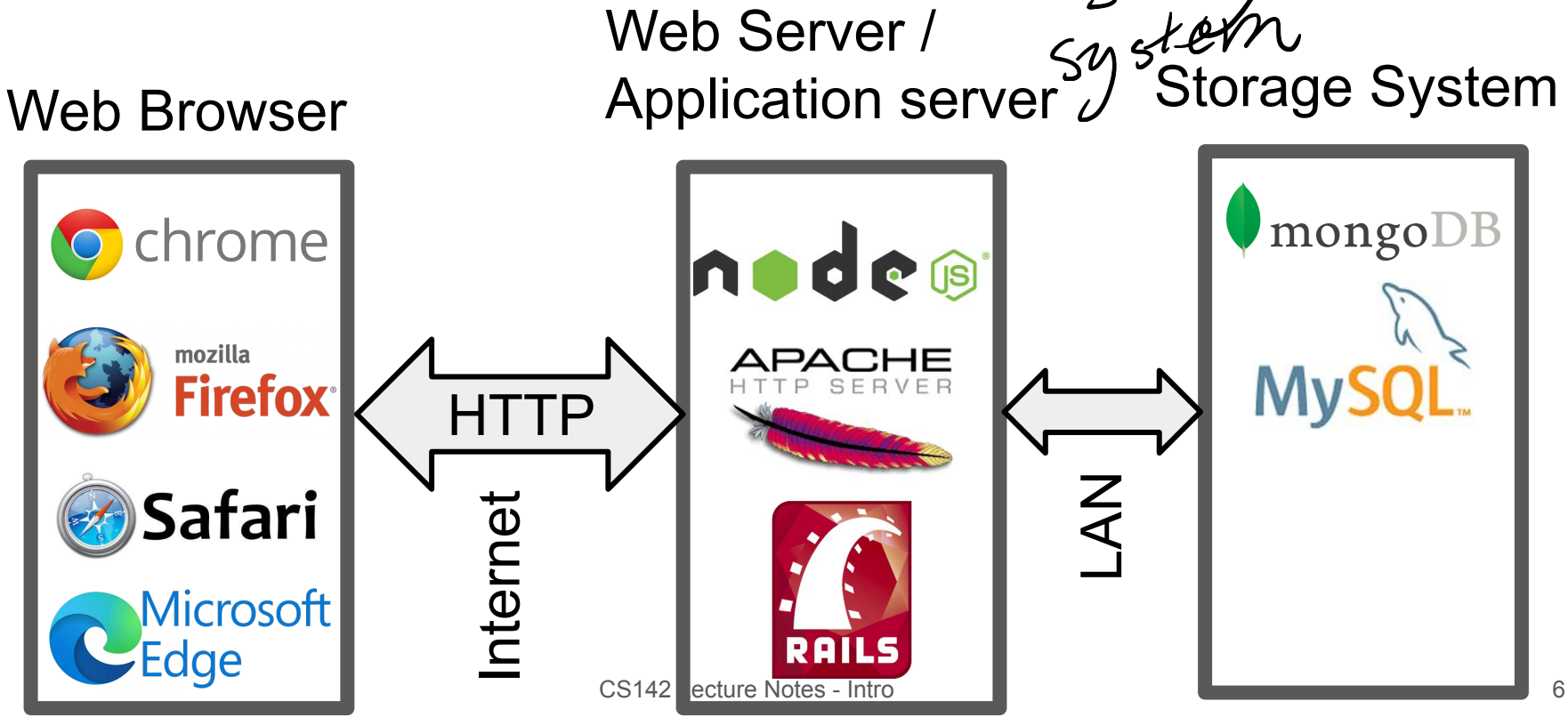
Technologies used to **build** modern web applications

- 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

70% Projects - 8 projects (Most due on Thursdays - First due 4/8, last due 6/4)

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

30% Quizzes - Three 45min online quizzes taken in 24-hour windows

Available 11:30AM PDT and due by 11:30AM PDT the next day

1. Available: Monday 4/19 Due by: Tuesday, 4/20, 11:30AM PDT
2. Available: Monday 5/10 Due by: Tuesday, 5/11, 11:30AM PDT
3. Available: Wednesday 6/2 Due by: Thursday, 6/3 11:30AM PDT

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
- Quizzes focused on concepts presented in class but not used in projects
  - Possible to do well on all the projects and not get a good grade in the class
  - Need understanding beyond "magic incantations"

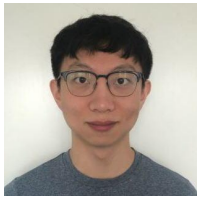
Course Staff

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

Course Assistants (cs142-spr2021-staff@lists.stanford.edu)

Brian Jang

Caci Jiang



Easton Xu

Kelly Ndombe

Kevin Qian

Ofure Ebhomielen

Silvia Gong

Tassica Lim

Yawen Shen

Course Communication

1. Course website: http://cs142.stanford.edu - Good starting point
2. Canvas - https://canvas.stanford.edu/courses/135678
   Zoom meeting links and cloud recordings of lectures and sections
   Course calendar - Office hour meeting links, etc.
3. 
   Forum - https://edstem.org/us/courses/5286/discussion/
   Join link in first Canvas Announcement posting
   Good for questions/comments where everyone can see the reply
   Can also posts privately to course staff (Use for post containing code)
4. Email - cs142-spr2021-staff@lists.stanford.edu
   Good for private communication with the course staff (CAs and myself - mendel@cs.stanford.edu)

CS142 Course Project Evolution

Largely driven by trends in industry this course has a long history time-honored

C142 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 the day after project is released:

P1-P7 weekly on Fridays at 11:30am PDT

P8 Tuesday 5/25 at 5:30PM PDT

Class software requirements

- A modern web browser

  Chrome is strongly suggested

- 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

Environments Required!

Stanford Honor Code

We want you to do the projects individually

Questions?