

CS142 - Web Applications

<http://cs142.stanford.edu>

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Some new changes for CS142 this quarter

- No in-person meetings
 - All meetings (lectures, sections, office hours) will be done using Zoom meetings
- Only pass/failure (S/NC) grading available
 - C- or better maps to a S grade
- No traditional end of the quarter final exam and "dead week"
 - Exams replaced with 3 timed quizzes
 - New material presented up through the last day of the quarter
- Good news: CS142 was going to online via SCPD so changes not bad for us
- New 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 Zoom cloud recording
 - 1st week "shopping" period: Anyone with a Stanford account can view
 - Rest of the quarter: Anyone in class (or access to the Zoom link and a Stanford account)

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 to do?
- What kind of computing environment do I need?
- Do I need to buy a textbook?
- Are the course lectures recorded 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 \Leftrightarrow Web server \Leftrightarrow Storage system

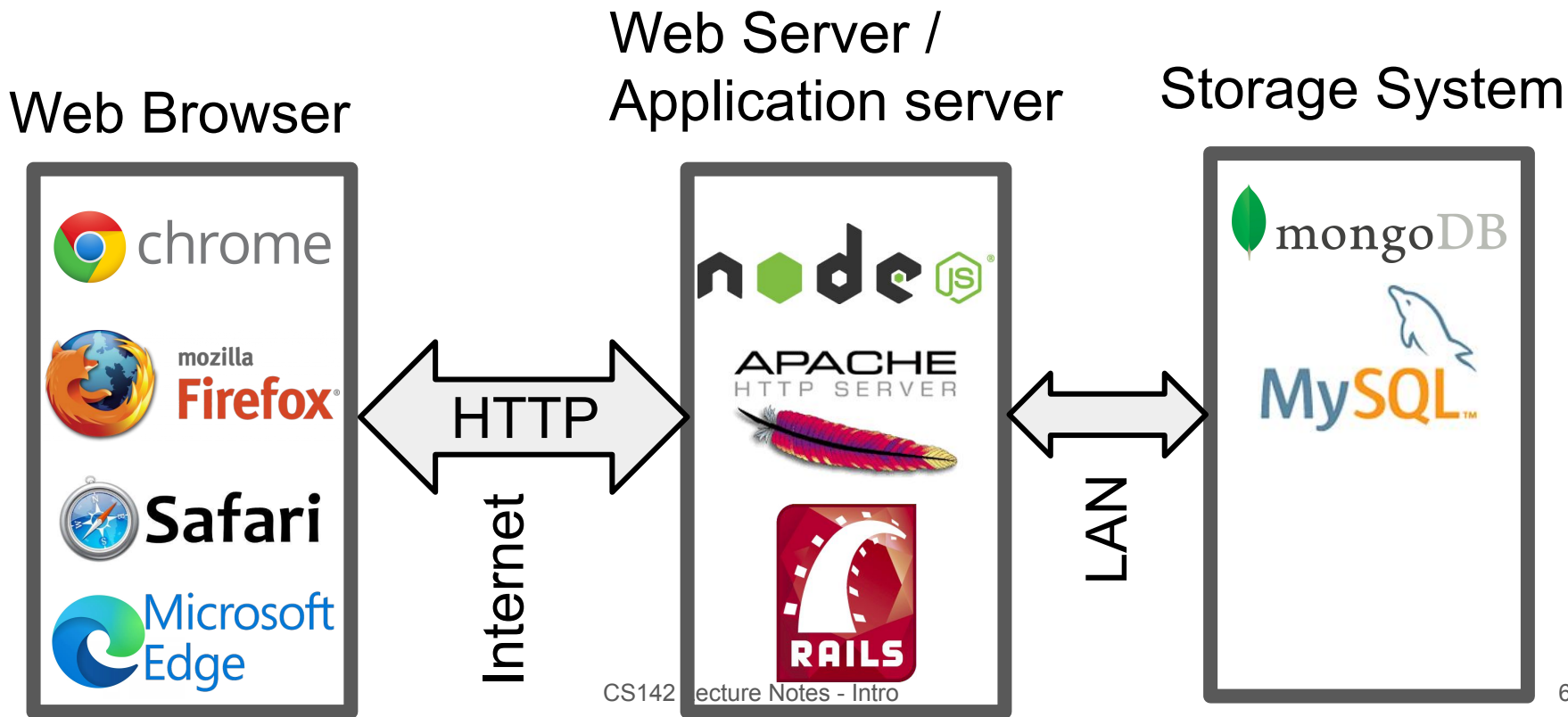
Learning Goal: Learn how a web application is built and run

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 (Due on Thursdays - First due 4/16, last due 6/10)

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 - 3 timed take-home quizzes

Roughly spaced out over the quarter

Details later this week

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

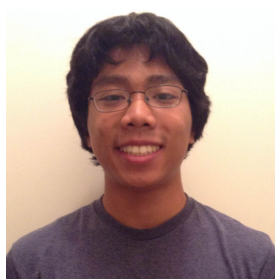
Instructor: Mendel Rosenblum (mendel@cs.stanford.edu)



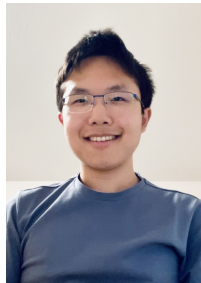
Course Assistants (cs142-spr1920-staff@lists.stanford.edu)



Ben Anderson



Darrith Phan



Eurim Choi



Junming Wang



Raven Jiang



Richard Kahn



Victor Chen

Course Communication

1. Course website: <http://cs142.stanford.edu>
2. Canvas - <https://canvas.stanford.edu/courses/116323>
Zoom meeting links and cloud recordings of lectures and sections
Course calendar - Office hour meeting links, etc.
Assignment submission
3. 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)
4. Email - cs142-spr1920-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 weekly on Fridays

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?