CS144: MEAN Stack

• Traditional Web development
  – Stack
    * HTTP: Apache/Nginx
    * Business logic: PHP/Servlet
    * Data: MySQL
  – (Almost) all code runs on the server
  – Browser is a passive HTML/CSS rendering engine

• After AJAX
  – Most code runs in the browser as JavaScript
    * Started as just fancy animation, but incrementally more things are implemented in client-side JavaScript
    * Server has gradually transformed to be a “back-end service” that provides data-persistence and transaction support
  – Benefits
    * Better user experience
    * Less load on the server (leading to better server scalability)
  – Challenges
    * Increasing complexity in the JavaScript code
    * Impedance mismatch
      ▶ JavaScript on client, PHP/Java on server
      ▶ JSON for data transport, relation for data storage
  – Questions
    * Q: Can we use JavaScript for both client and server development?
    * Q: Can we use JSON as the data model for storage engine?
    * Q: Any way to reduce complexity of client-side development?

• Modern Full-Stack Web Development
  – Data: MongoDB
  – Business logic: Node.js + Node.js modules such as Express
  – Presentation: Angular/React/Vue, …