THE ART AND SCIENCE OF WEB PROGRAMMING

Ranjitha Kumar

CS498RK UIUC SPRING 2016

TEXT A OR B TO (217) 215-0242

A: ADMINSTRIVIA

0

VOTES

B: CONTENT

0

VOTES

ADMINISTRIVIA

ENROLLMENT IS AT MAX CAPACITY

KEEP CHECKING ONLINE FOR OPENINGS

GET YOUR GITHUB STUDENT DEVELOPER PACK

COURSE STAFF

Ranjitha Kumar
Siebel 3116, Wednesday 1-2 PM

Biplab Deka

TBD

Abhishek Harish

TBD

No OH this week

Please don't email us -- use Piazza

LECTURES & LABS

Lectures cover theory and concepts

Labs walk through concrete code examples

Bring your laptops to labs and follow along

ASSIGNMENTS / MPS

5 MPs

Learn the entire Web stack

Late assignments receive **no credit**

Three 24-hour late days

FINAL PROJECT

Design, implement, and deploy original Web app

3-4 person team

Multiple checkpoints: proposal, functional prototype

No late days

EXAMS

3-hour midterm on Mar 29th

Alternative arrangements must be made **two-weeks prior** to exam

No final exam

ACADEMIC INTEGRITY

Consult external resources to complete assignments

Clearly cite any contributing source

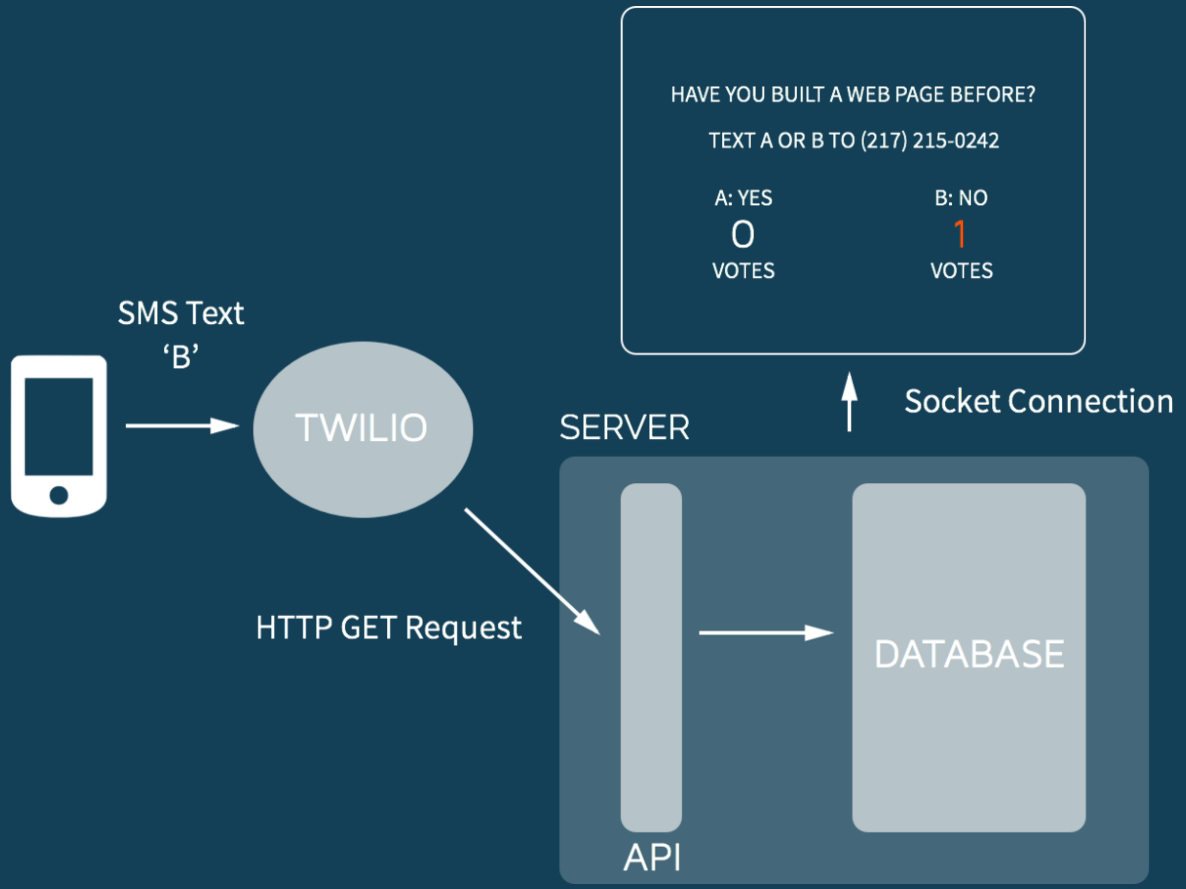
Failure to cite any contributing source will be considered cheating

Verbatim duplication of any source will always be considered plagiarism

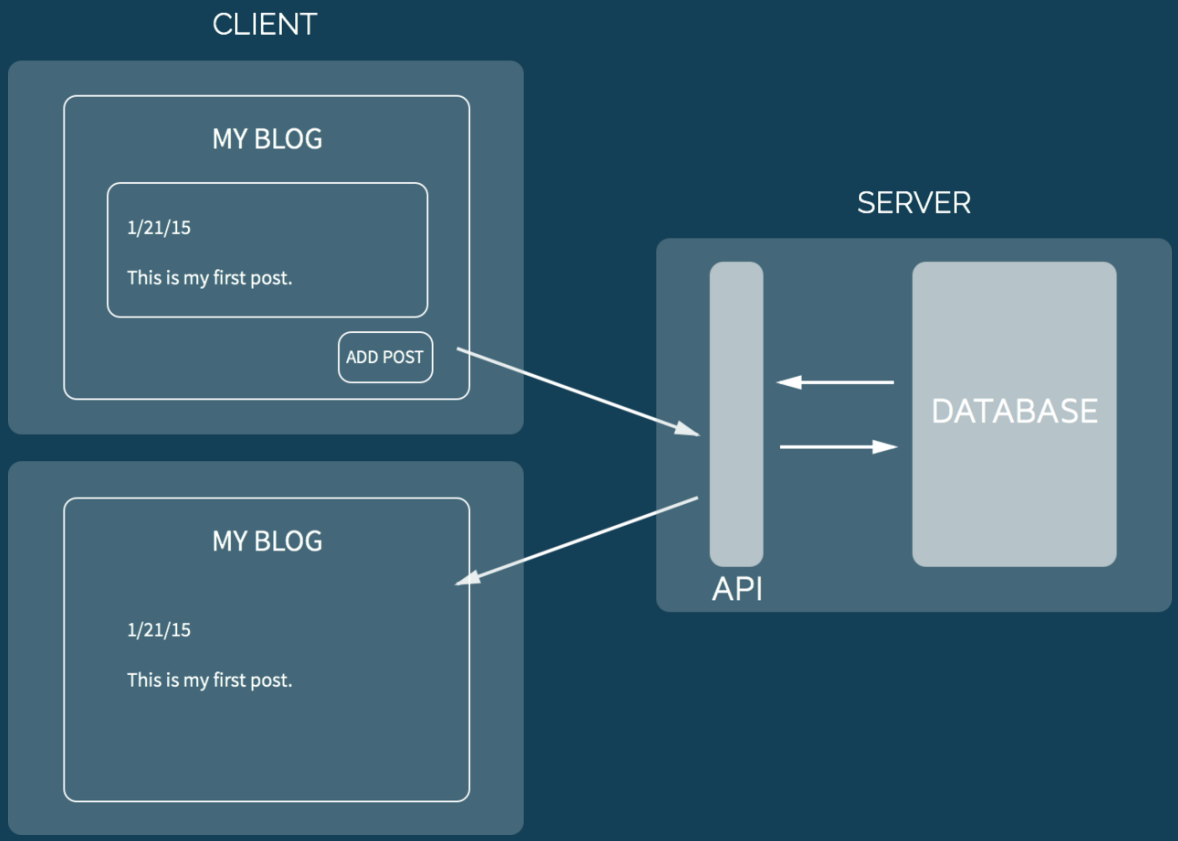
courses.engr.illinois.edu/cs498rk1

COURSE OVERVIEW

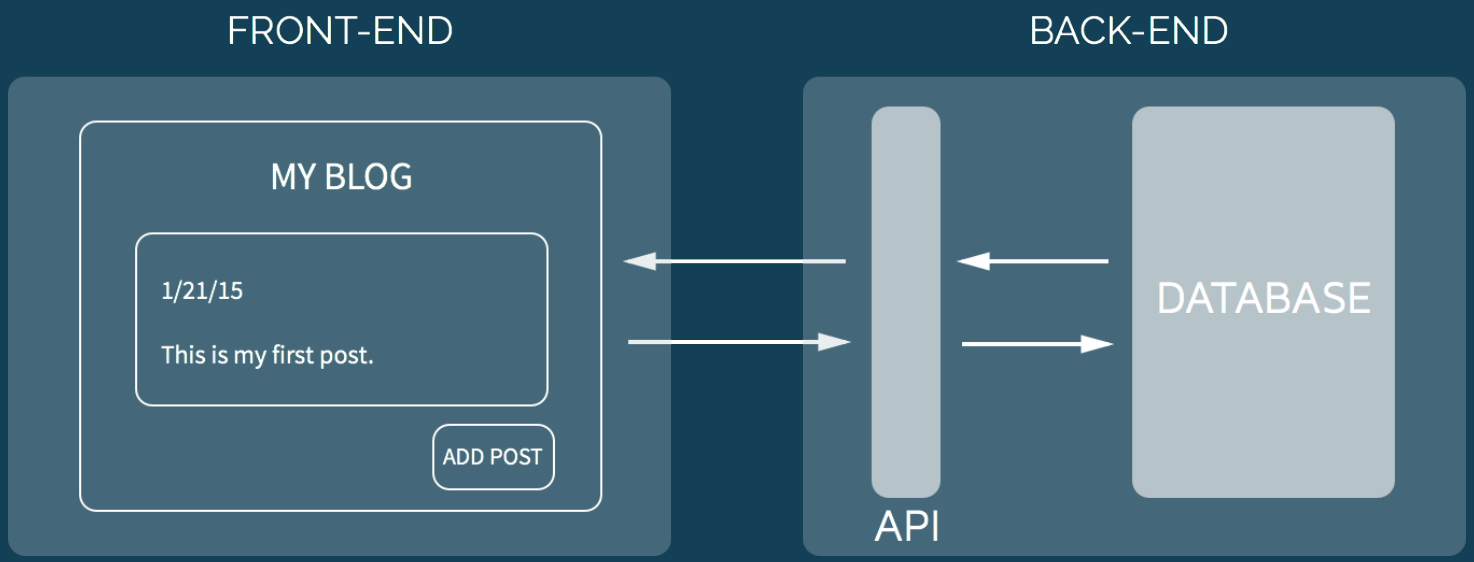
HOW DID THE DEMO WORK?



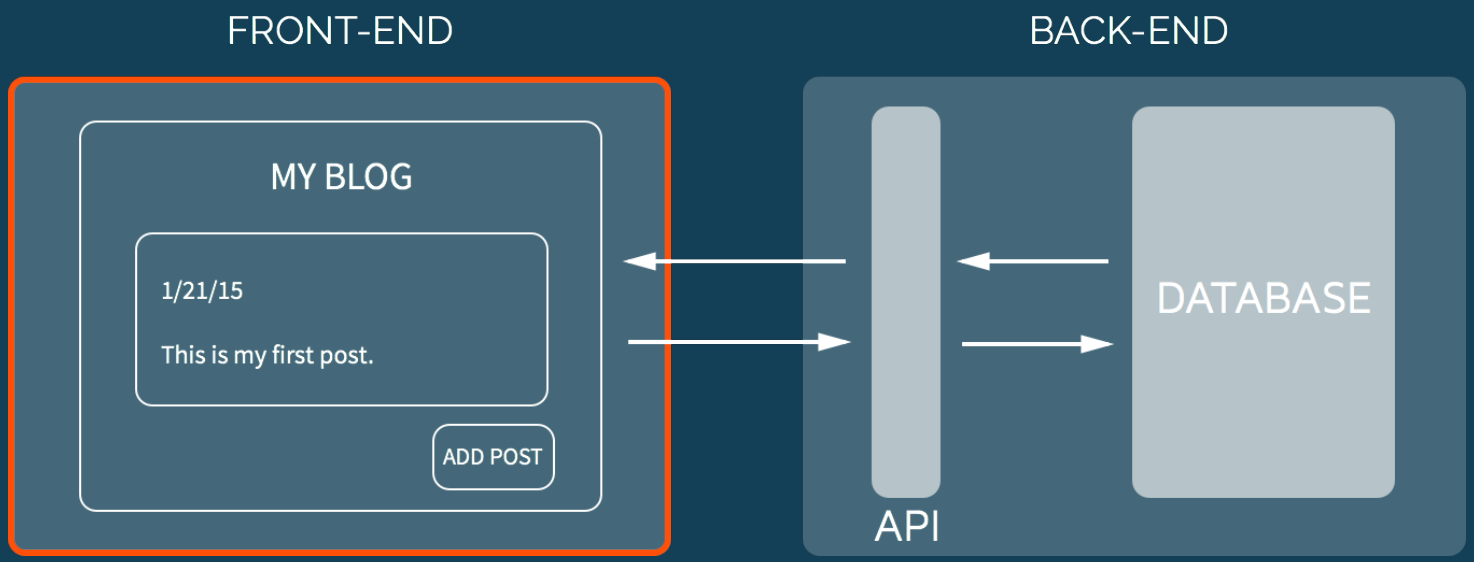
CLIENT-SERVER MODEL



COURSE OVERVIEW



FRONT-END


FRONT-END
BACK-END
MY BLOG
1/21/15
This is my first post.
ADD POST
API
DATABASE

FRONT-END BASICS

HTML

Most web pages are written in HTML

Content is embedded in a set of nested HTML tags

Layout engine parses HTML into a Document Object Model

Web browsers use DOM to render pages

```
<html><head>
 <title>Photo Gallery</title>
 <link rel="stylesheet"
 href="gallery.css"
 type="text/css"/></head>
 <body>
 <div class="photo">
     <h3>My first photo</h3>
     <img src="picture1.jpg"/>
 </div>
 ...
 ...
 </body>
</html>
```

CSS

Language for specifying presentation

Selectors map styles to markup

Describe how to render

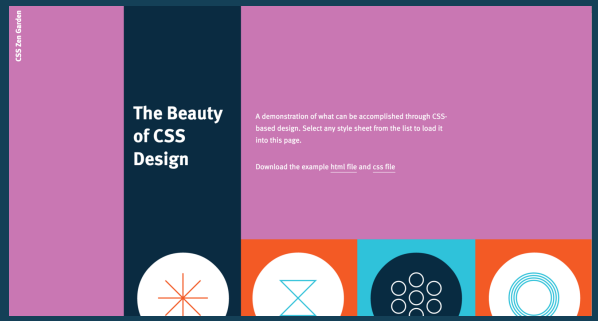
```
<html><head>
 <title>Photo Gallery</title>
 <link rel="stylesheet"
 href="gallery.css"
 type="text/css"/></head>
 <body>
 <div class="photo">
     <h3>My first photo</h3>
     <img src="picture1.jpg"/>
 </div>
 ...
```

HTML

```
@import url("base.css");
img {
 border:1px solid black;
}
.photo {
 width:300px;
}
.photo h3 {
 font-weight:bold;
}
...
```

CSS

Separation of content from presentation



csszengarden.com

JAVASCRIPT

front-end interactions

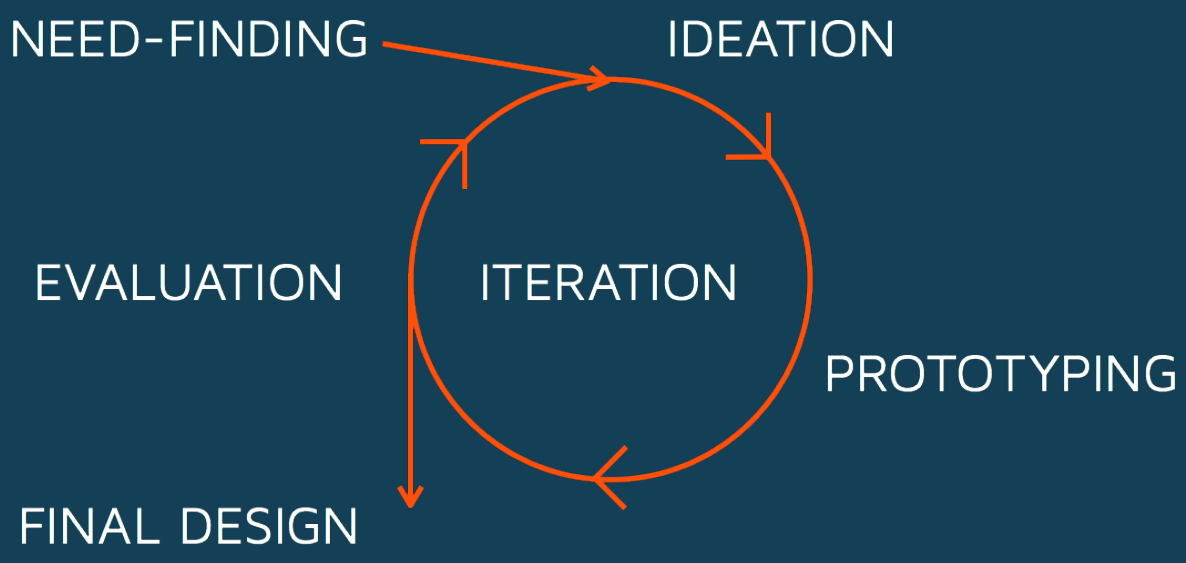
dynamic content

server-side programming (node.js)

object-oriented, imperative, functional

FRONT-END DESIGN

UI DESIGN


NEED-FINDING
IDEATION
EVALUATION
ITERATION
PROTOTYPING
FINAL DESIGN

VISUAL DESIGN

Color

Typography

Grids

RESPONSIVE DESIGN

Designing for different form factors

DATA BINDING

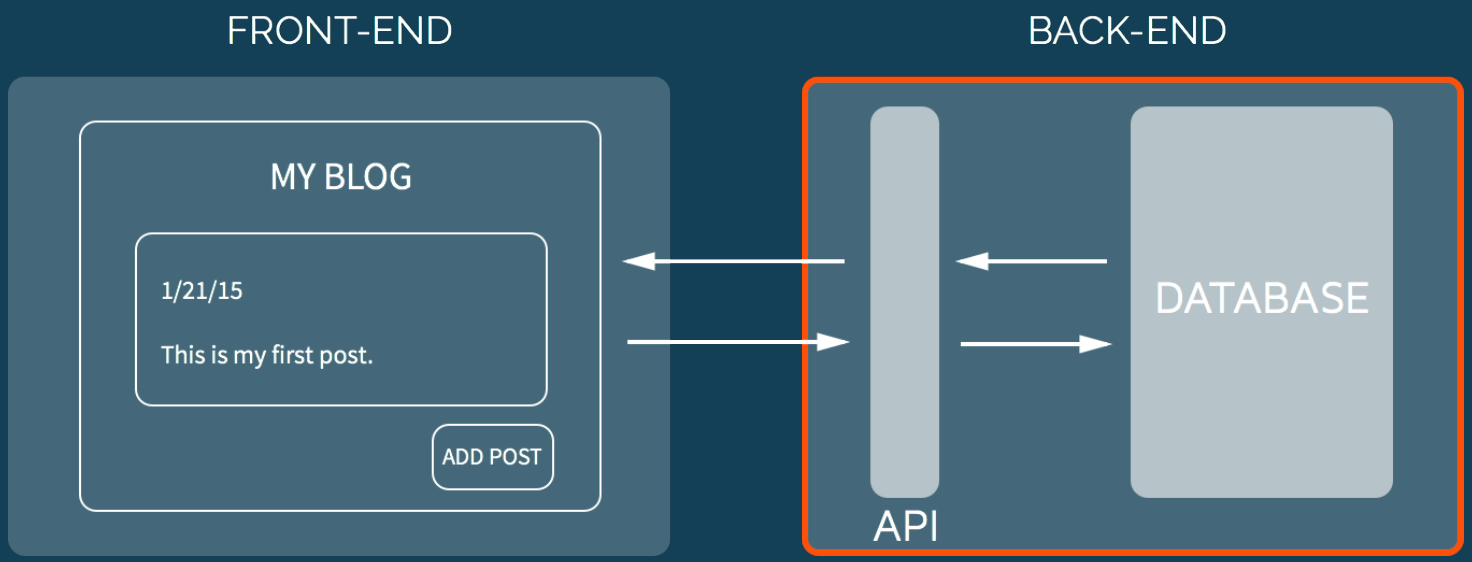
Model-View-Controller

HTTP: request-response protocol

AJAX: send and receive data
without reloading page

JSON: data exchange format

BACK-END


FRONT-END
BACK-END
MY BLOG
1/21/15
This is my first post.
ADD POST
DATABASE
API

DATABASES

SQL (MySQL)

NoSQL (MongoDB)

Graph (Neo4j)

APIs AND SERVER LOGIC

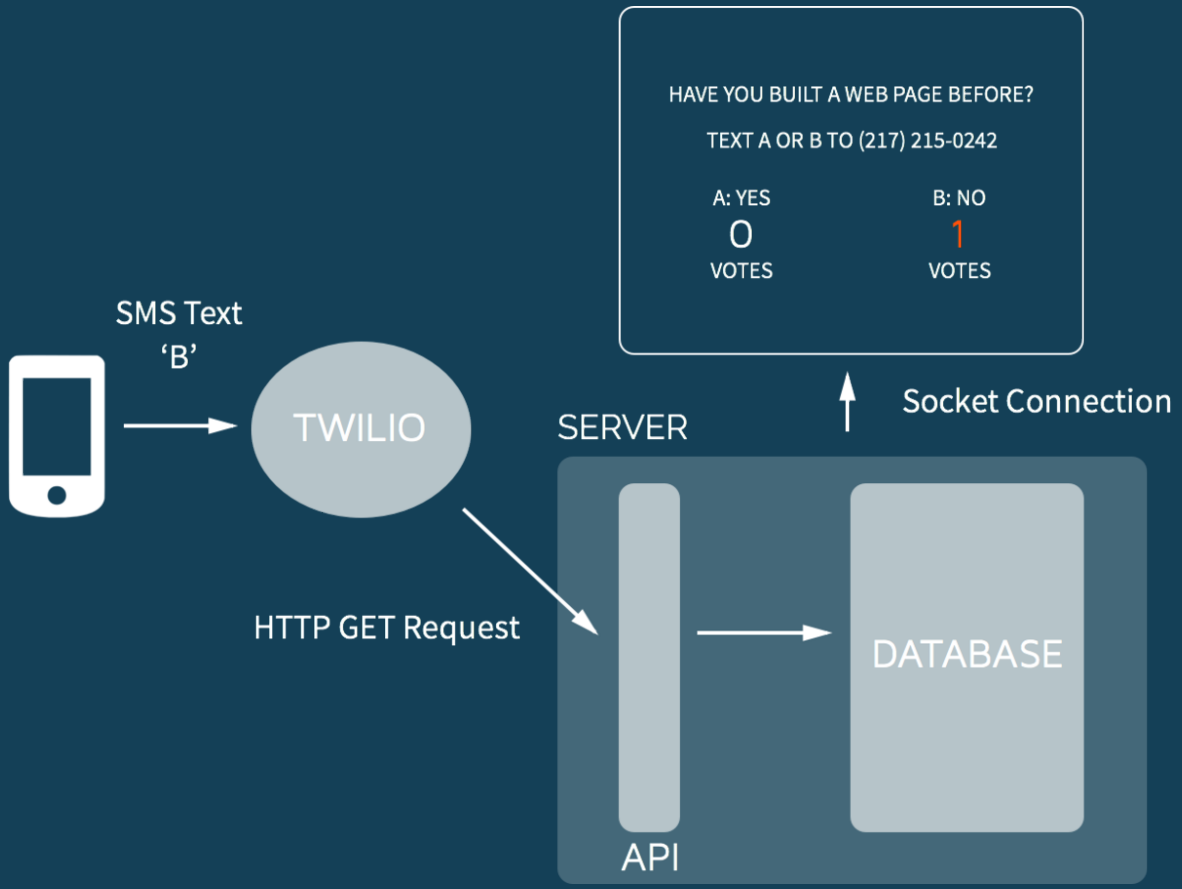
HTTP requests: GET, POST, DELETE

Designing a RESTful API

Node.js and Express

Web Sockets

PUTTING IT TOGETHER



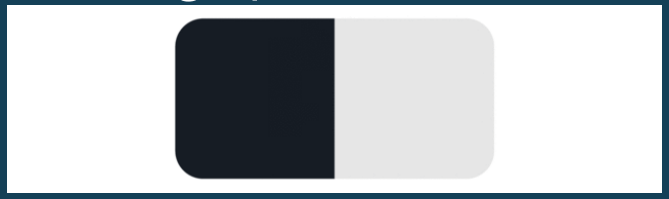
WILL THIS COURSE BE OUTDATED NEXT YEAR?

Focus on concepts not just specific technologies

Understand how trends arose and have changed

~1989: Unix-based web browsers

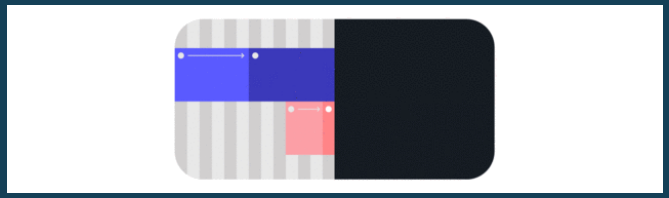
~1995: First graphical Web browsers



~1995: Javascript & Dynamic Content

www.fastcodesign.com/3039402/the-history-of-web-design-explained-in-9-gifs

~1996: Flash animations



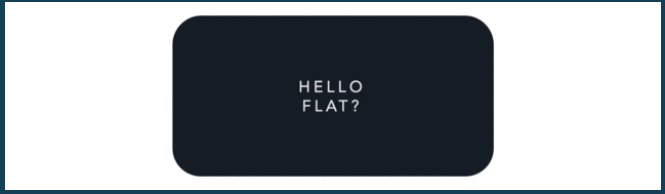
~1998: CSS came on the scene

~2007: Grid systems

www.fastcodesign.com/3039402/the-history-of-web-design-explained-in-9-gifs

~2010: Responsive design

Last few years: Flat design



Future?

www.fastcodesign.com/3039402/the-history-of-web-design-explained-in-9-gifs

MODERN WEB TECHNOLOGIES

CSS Preprocessors: LESS, SASS

JS Libraries: JQuery

Grid Frameworks: Twitter, Foundation, Susy

MEAN Stack: AngularJS, MongoDB, Node.js, Express

Mobile: PhoneGap, Parse, Firebase

DESIGN EMPHASIS

Final project is a simulation of industry

Need-finding: Problem? User?

Evaluation: Test both code and experience

Iteration: Functional prototype due 3 weeks before final presentation

NEXT CLASS: HTML