COMP 431/531: Web Development

Lecture 1: HTML

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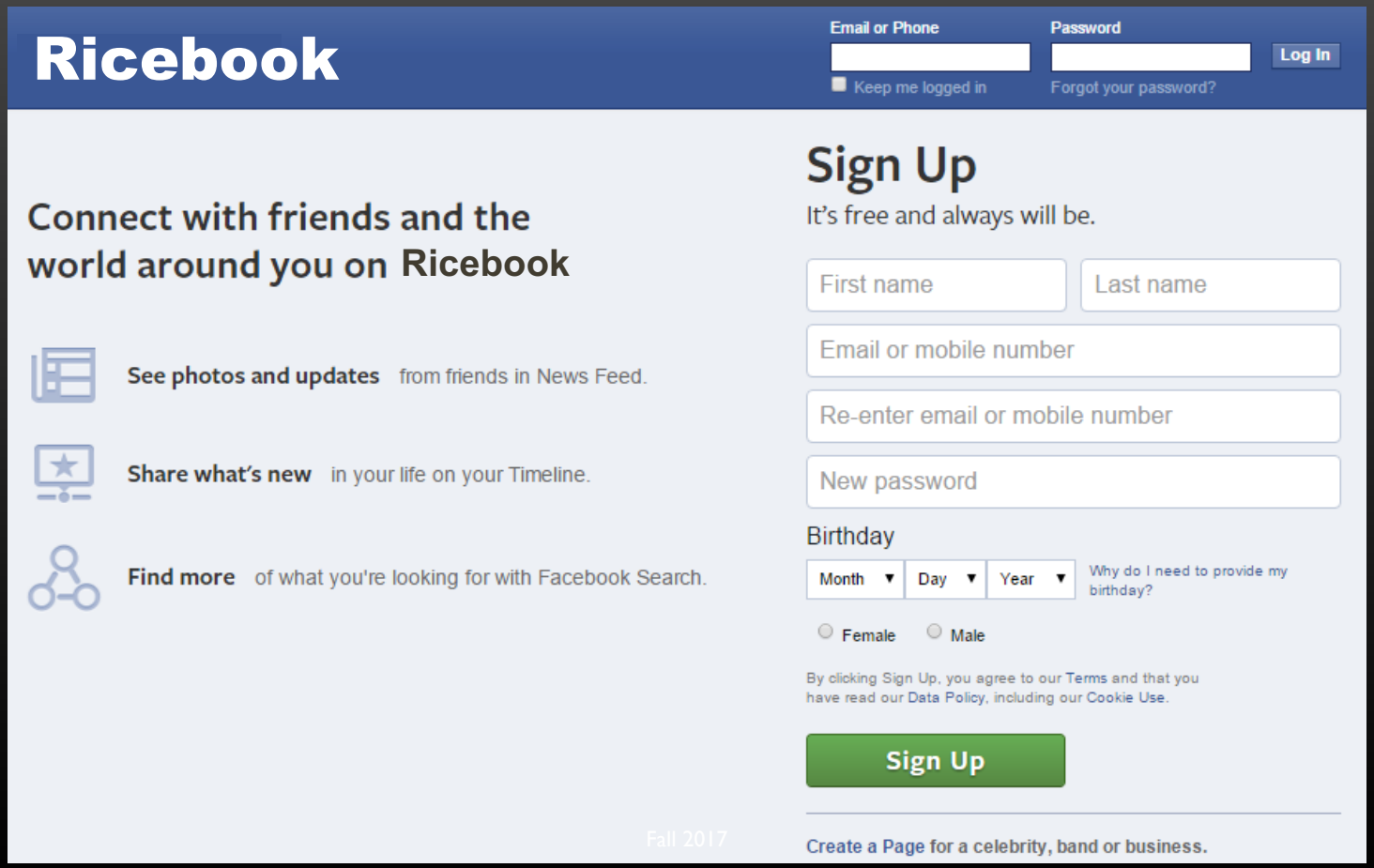
https://www.clear.rice.edu/comp431

Goal: Multi-User Web Application

- Full Stack Development
  - Front-End (HTML, CSS, JavaScript, Framework)
  - Back-End (Web servers, Databases, Security)

- Software Engineering Design
  - Test Driven Development (Unit Testing, End-to-end testing)
  - Good design principles (e.g. encapsulation)

Final Web Application



Assumptions/Expectations

- No prior HTML/CSS/JavaScript experience
- Motivated to learn about web development and design

Administration

Instructor: Mack Joyner

TAs: Rex Le, Jingbin Qian, Prashithaa Balaji

Office Hours: See course website (www.clear.rice.edu/comp431)

Piazza: https://piazza.com/class/mdz1yc4pqh44bl

Github classroom (hw1): https://classroom.github.com/a/gsvZWWoo

Grades: Canvas (has slides)

Acknowledgment: *Special thanks to Scott Pollack and Leo Elworth*

Git Classroom

- We'll use GitHub classroom
  - Create a GitHub account if you don't have one
  - Click on GitHub repo link (slide 5)
  - Link git id (name) to git repo (first repo)

- Submit code often
  - Recommend using an IDE (IntelliJ - ultimate edition)
  - git add
  - git commit -m "description of change"
  - git push origin main (don't forget)

Grade Policies

Course Rubric

- Homework (not including final web app, with 531 presentation) 60%
- Final Web App 20%
- Quizzes 10% (on-line quizzes on Canvas)
- Class Participation 5% (in-class worksheets)
- Peer Reviews 5%

In-Class Exercises

- We'll have 1 for each class lecture
- Based on material presented in the lecture
- Grade rubric
  - 1 = submit before end of class
  - 0.5 = submit before beginning on next class
- Submit in-class exercises in Canvas

Assignments

1. Simple HTML page
2. Dynamic Page
3. JavaScript Game
4. Draft Front-End
5. Front-End Application
6. Draft Back-End
7. Final Full Web App

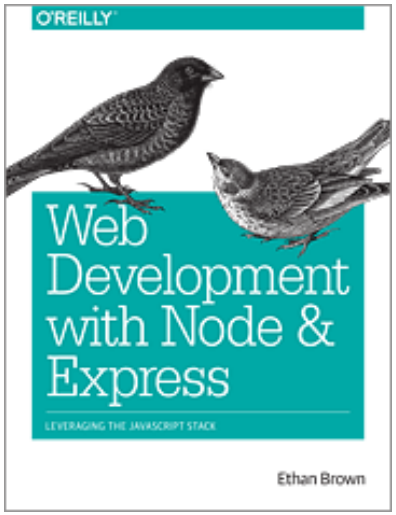
Late Assignment Policy

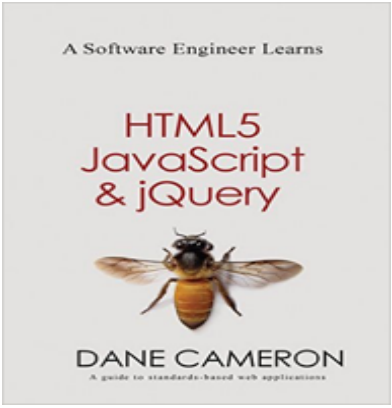
- You will have 3 slip days
  - When you use a slip day, you'll have an additional 24 hours to turn in assignment
  - Use README to indicate when you are using a slip day

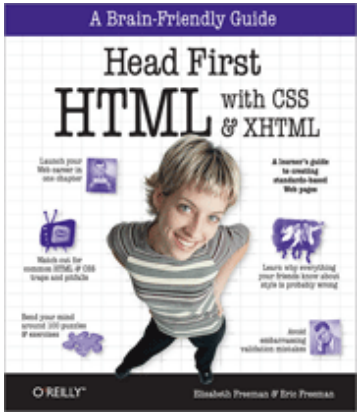
- No late submissions (other than those using slip days) will be accepted

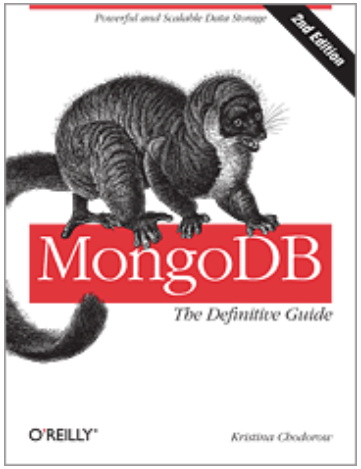
Textbooks

- **No required texts**
- **You may find these helpful…**









Editors

Atom

IntelliJ

Sublime

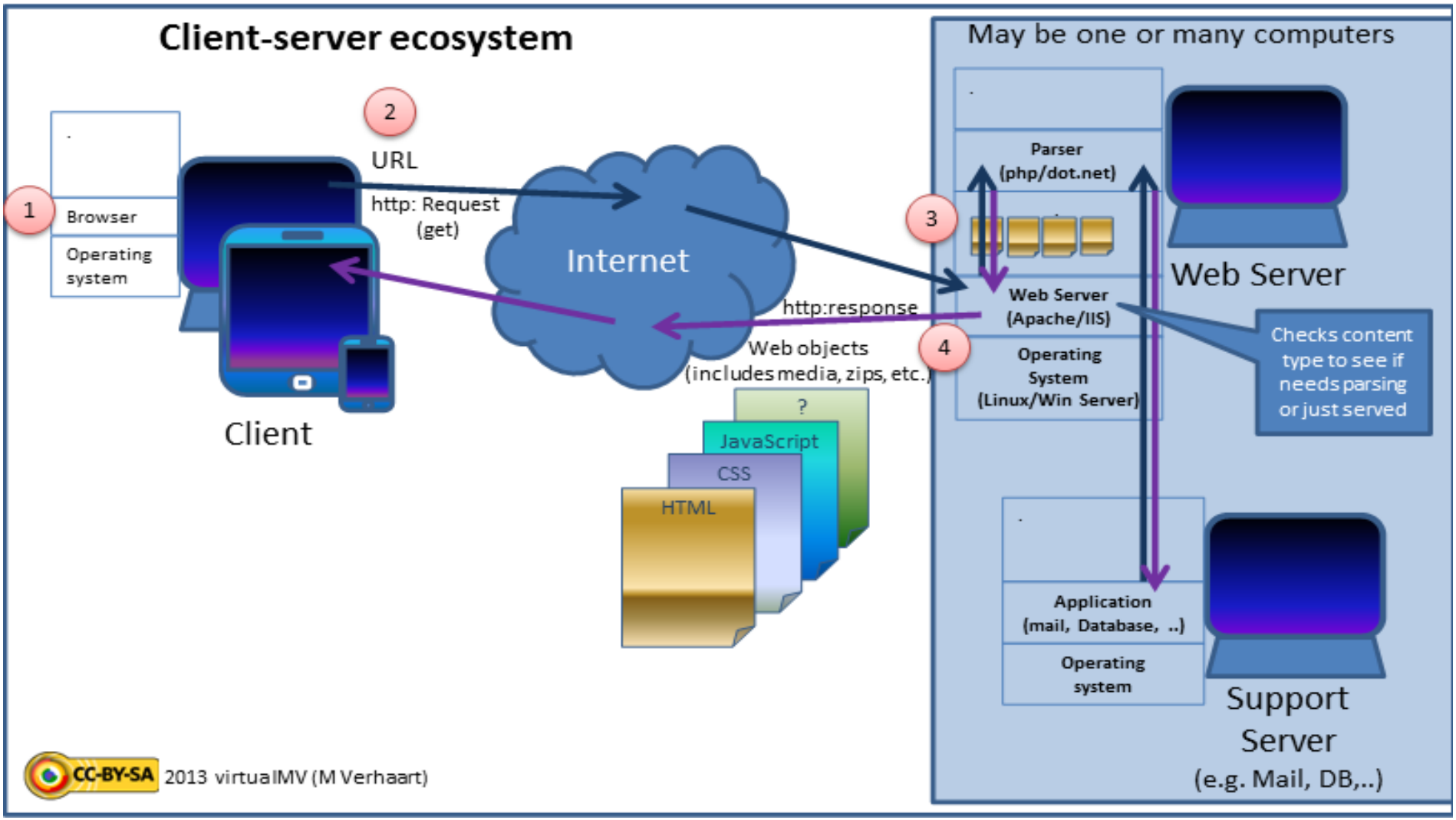
Advice

- Start assignments early
- Ask for help often (check Piazza for questions/answers)
  - most of the TAs all went through course last semester
- Finish homework assignments
  - assignments build on each other (challenge to catch-up)
- Use people outside the course to test your web application

History of HTML

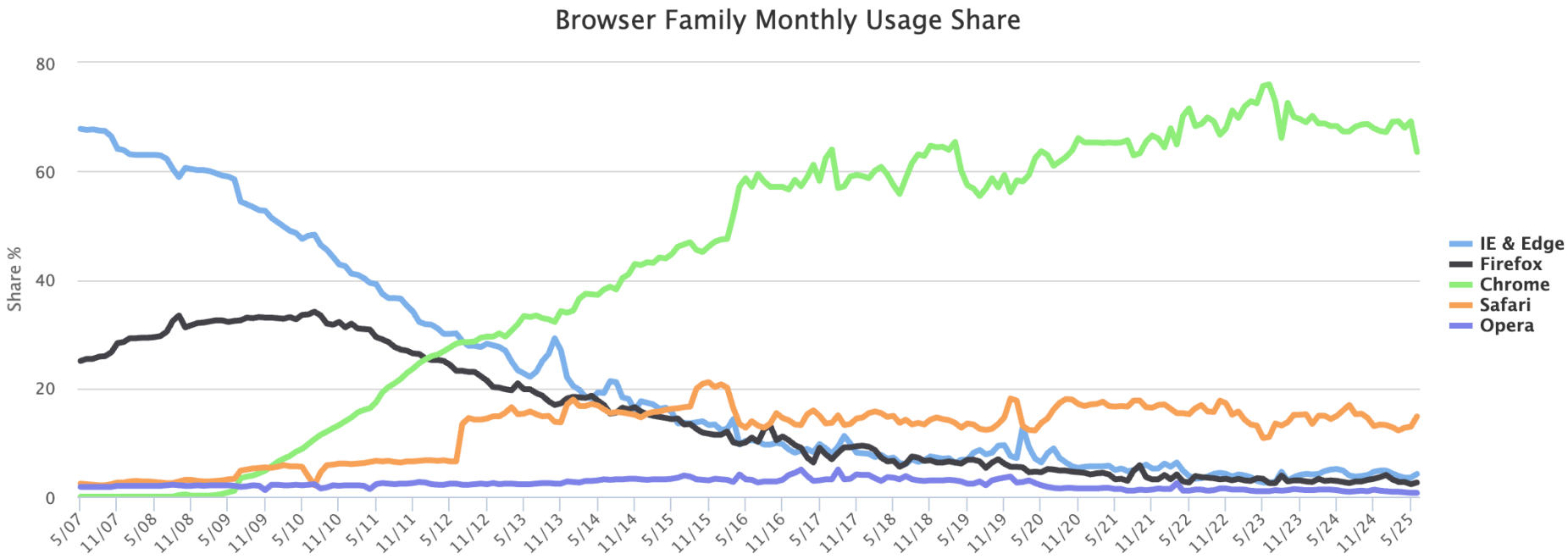
- 1989 - World Wide Web
- 1991 - HTML tags formally introduced
- 1993 - HTML specification [Netscape]
- 1995 - HTML 2.0 [Internet Explorer]
- 1997 - HTML 4.0
- 2000's - Browser wars [Firefox, Safari, Chrome, …]
- 2014 - HTML5

World Wide Web Ecosystem



Web Browser Usage Trends

https://www.w3counter.com/trends



HTML 5

- First line of document defines document type

Current HTML 5

```
<!DOCTYPE html>
<html lang="en-US">
<!-- language is helpful for screen
     readers and search engines -->
```

- HMTL 4.01 Strict (old way)

<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.01//EN" "http://www.w3.org/TR/html4/strict.dtd">

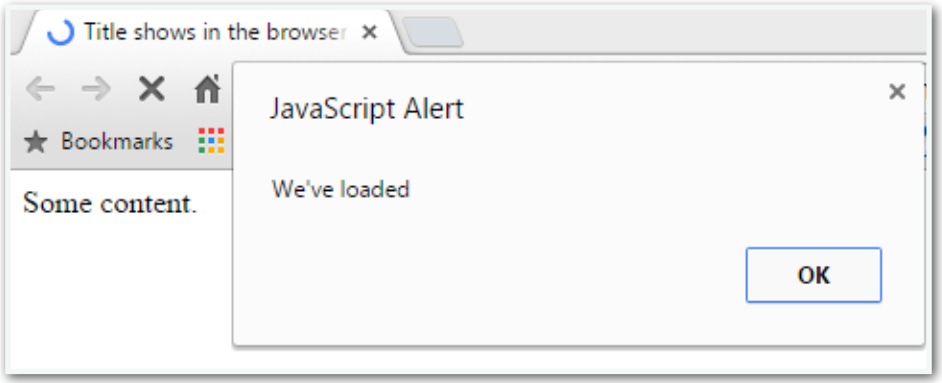
- HTML body by default
  - Could omit *<html>*, *<head>*, *<body>* tags
  - We won't omit the tags, write "complete" HTML

Initial file created in IntelliJ

```
1  <!DOCTYPE html>
2  <html lang="en">
3  <head>
4      <meta charset="UTF-8">
5      <title>Title</title>
6  </head>
7  <body>
8
9  </body>
10 </html>
```

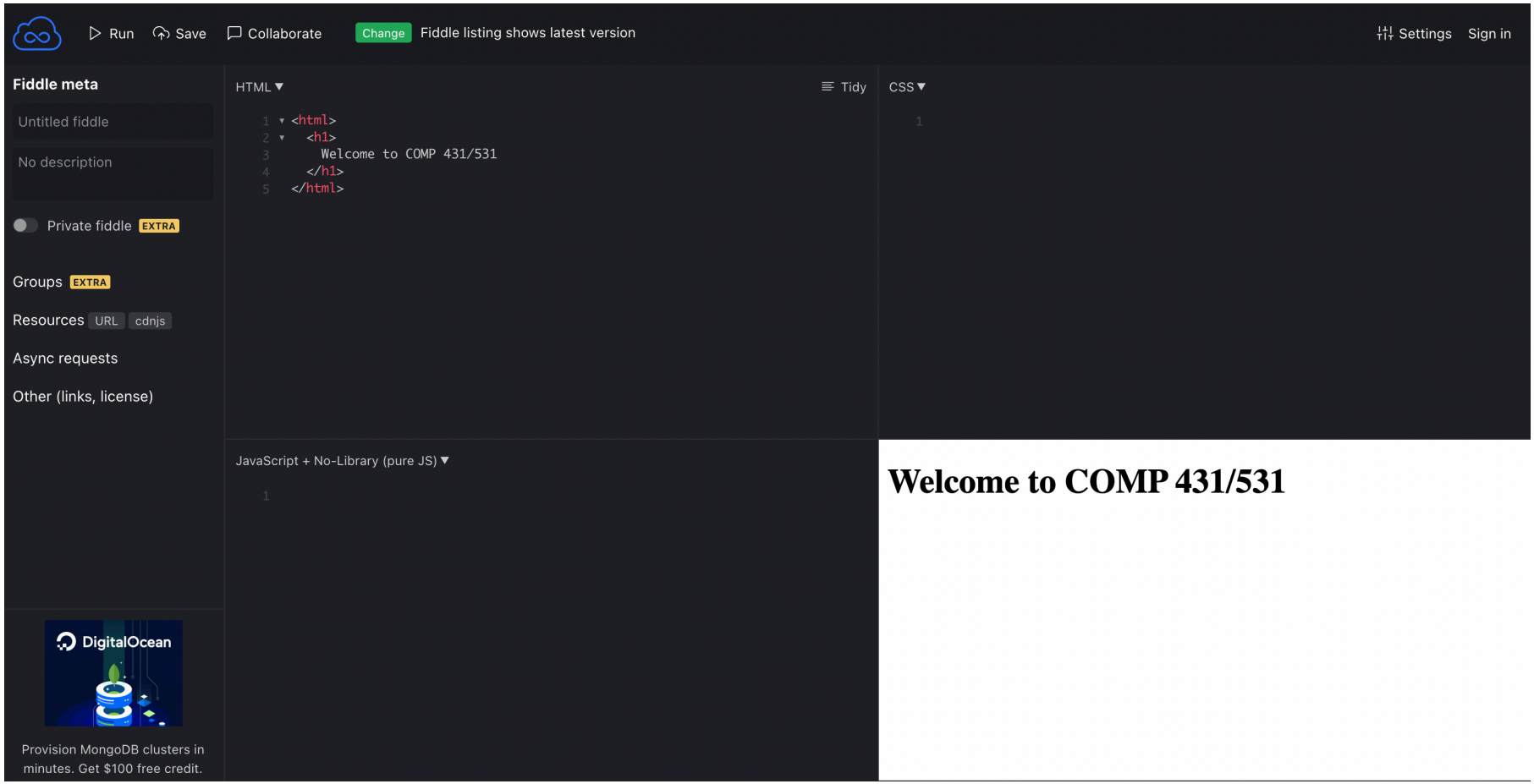

Basic structure of an HTML page

```
 1  <!DOCTYPE html>
 2  <html lang="en-US">
 3  <head>⋯
24  </head>
25
26  <body onload="doSomething()">
27  Some content.
28  </body>
29  </html>
30
31  <script>
32  function doSomething() {
33      alert("We've loaded");
34  }
35  </script>
36
```



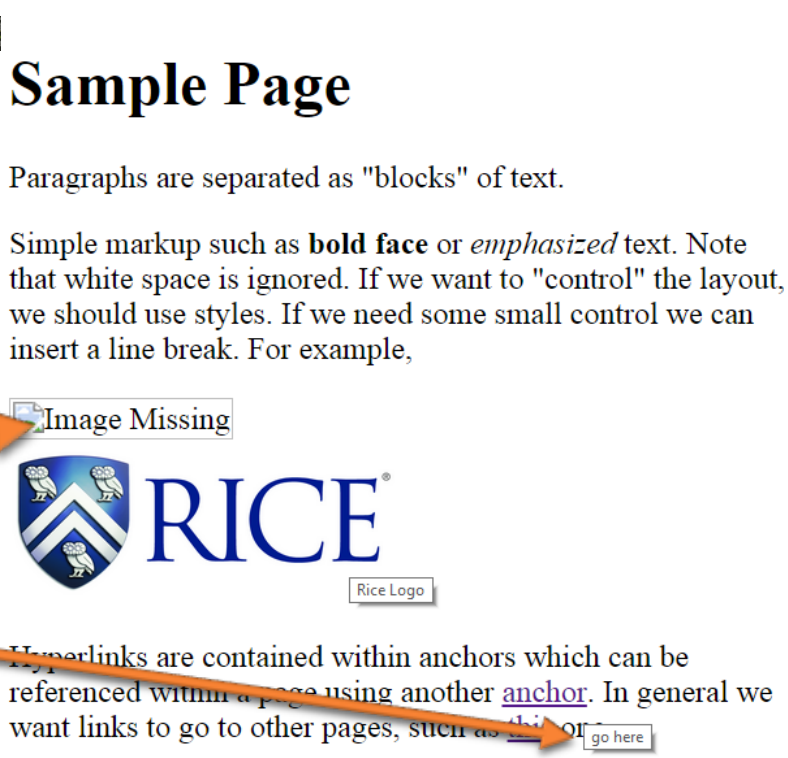
W3Schools is a good resource (www.w3schools.com)

jsfiddle.net



Markup

```
25  <body>
26
27  <h1>Sample Page</h1>
28
29  <p>Paragraphs are separated as "blocks" of text.</p>
30  <p>Simple markup such as <b>bold face</b> or <em>
    emphasized</em> text.
31
32  Note that white space is ignored.
33
34  If we want to "control" the layout, we should use
    styles.  If we need some small control we can
    insert a line break.  For example,</p>
35  <img src="brokenImage.jpg" alt="Image Missing">
36  <br/>
37  <img src="../../RiceLogo.jpg" width="200px" title="
    Rice Logo">
38  <p>Hyperlinks are contained within <a name="anchor">
    anchors</a> which can be referenced within a page
    using another <a href="#anchor" title="go here">
    anchor</a>.  In general we want links to go to
    other pages, such as <a href="https://developer.
    mozilla.org">this</a> one.</p>`
39  </body>
40  </html>
```



Inline vs Block

- We markup to control layout.
  - Sometimes you want content “blocks” separate from other blocks.
  - Sometimes you want to inline layout or style
- Inline:
  - *<b>*
  - **
  - *
*
  - **
- Block:
  - *<p>*
  - * *

More HTML Fundamentals

```
40  <hr/>
41  <!-- this is a comment -->
42  <table border="1">
43      <thead>
44          <tr><th>Centered by Default</th><th>Column Header</th></tr>
45      </thead>
46      <tbody>
47          <tr><td>Row</td><td>Content</td></tr>
48          <tr><td colspan="2">span two columns to format our table better</td></tr>
49          <tr><td>Lazy...</td></tr>
50          <tr>
51              <td>Here is an ordered list
52                  <ol>
53                      <li>first item</li>
54                      <ol>
55                          <li>nested item</li>
56                      </ol>
57                      <li>another item</li>
58                  </ol>
59              </td>
60              <td>and an unordered list
61                  <ul>
62                      <li>first item</li>
63                      <li>another item</li>
64                  </ul>
65              </td>
66      </tbody>
67  </table>
```


More HTML Fundamentals

Centered by Default	Column Header
Row	Content
span two columns to format our table better	
Lazy...	
Here is an ordered list 1. first item 1. nested item 2. another item	and an unordered list • first item • another item

We must escape < and > in addition to & and a few other character. Sometimes we want to control the amount of space " " in a cell in a table, we can do that with non-breaking spaces for example.

```
Pre-formatted text will   appear   as  it is written
exactly (we hope)
        And it renders some HTML!

function example() { var foo = "bar"; console.log(foo); }
```


Metadata (Tag)

- The <*meta*> tag provides page metadata:
  - details about the page (e.g. author)
  - data not displayed on page
- Always put <*meta*> tag inside <*head*> tag
- Pass metadata as key/value pairs
  - attribute (e.g. name, content) defines type
  - need content attribute if name attribute is defined

```
4       <meta charset="UTF-8">
5       <meta name="author" content="Mack Joyner">
```


Metadata (Viewport)

- Set the viewport to change the page based on device size:

```
9    <meta name="viewport" content="width=device-width, initial-scale=1">
```

- width=device-width sets width of page based on device width

- initial-scale=1.0 sets the initial zoom level

Some HTML Resources

- W3Schools (http://www.w3schools.com/)
- Mozilla Developer Network (https://developer.mozilla.org/)
- Validate your HTML (http://validator.w3.org)
- Real-time HTML rendering (http://jsfiddle.net/bpenp4dq/)