

CSC435: Web Programming

Lecture 2: HTML basics

Bei Xiao
American University
Jan 18, 2019

Slide Content Borrowed from: Web programming courses from
University of Washington, Stanford University, MIT

Take-home reading & Tutorial

HTML Tutorial:

<https://developer.mozilla.org/en-US/docs/Web/Guide/HTML/Introduction>

How to do well in the course?

- We are going to cover **5 languages** or more in one semester (3 credits!) and without a lab session.....
- Lectures are ONLY guidance. Read the take-home online tutorials and materials for further understanding.
- Work with a peer.
- Contribute at least 1 hour a week to Creative Project.
- Do lots of coding exercises and practices.
- Complete homework EARLY and leave room for improvement (perfectionism is KEY for web development).

2017 Turing Award: Sir. Tim Berners-Lee for the invention of the WWW

- Invention of URL
- Hypertext Transfer Protocol (HTTP) that allows transfer of object on the Internet
- Web browser, a software application that retrieves and renders resources on the World Wide Web with clickable links.
- Hypertext markup Language (HTML)
- Browse the [first website](#)
- Read more about the [Turing award](#).

Website Organization

Content and Structure: HTML

Style: CSS

Behavior: JavaScript

HTML

Hypertext Markup Language

What is markup?

A language with specific syntax that instructs a Web browser how to display a page

What is HTML?

- HTML allows you to describe the content of a website.
 - Headers
 - Paragraphs
 - Images
 - Hyperlinks
- HTML also allows you to specify relationships between elements and group them using classes and div tag.

HTML Syntax

- HTML revolves around tag
- Opening and closing tags

<tag> content <tag>

Example:

bold a word

content, will bold the word “content”

<u>text </u> underline the text

Structure of an HTML page

```
<!DOCTYPE html>
<html>
    <head>
        information about the page
    </head>
    <body>
        page contents
    </body>
</html>
```

The DOCTYPE tag tells the browser to interpret our page as HTML5, the latest/greatest version of the language

Structure of an HTML page

```
<!DOCTYPE html>
<html>
    <head>
        information about the page
    </head>
    <body>
        page contents
    </body>
</html>
```

Structure of an HTML page

```
<!DOCTYPE html>
<html>
    <head>
        information about the page
    </head>
    <body>
        page contents
    </body>
</html>
```

Structure of an HTML page

```
<!DOCTYPE html>
<html>
    <head>
        information about the page
    </head>
    <body>
        page contents
    </body>
</html>
```

Structure of an HTML page

- The <head> tag describes the page and the <body> tag contains the page's content.
- An HTML page is saved into a file ending with .html.
- The DOCTYPE tag tells the browser to interpret our page's code as HTML5, the latest/greatest version of the language.

The New York Times

Wednesday, January 13, 2016 | [Today's Paper](#) | [Video](#) | [27°F](#) | [Nikkei -3.86% ↓](#)

World U.S. Politics N.Y. Business Opinion Tech Science Health Sports Arts Style Food Travel Magazine T Magazine Real Estate ALL

Cruz Did Not Report Loan From Goldman in Senate Race

By MIKE McINTIRE 17 minutes ago

As Ted Cruz tells it, loyalty and sacrifice helped finance his 2012 Senate bid in Texas. Turns out, a Goldman Sachs loan did as well, but it does not appear in reports filed with the Federal Election Commission.

- [Trump's Iowa Organization Still Seems an Afterthought](#)
- [Nikki Haley Turns on Trump in Rebuttal Speech](#)

30 minutes ago



Supporters of the right-wing group Pegida marching this week in Leipzig, Germany. Jens Schlueter/Getty Images

Fear Widens Divide Over Migrant Crisis

By JIM YARDLEY 3:56 PM ET

Anti-immigration groups and right-wing extremists have seized

The Opinion Pages

Iraq and the Kurds Are Going Broke

By THE EDITORIAL BOARD

Low oil prices could seriously damage the effort to defeat the Islamic State.



- [Editorial: Gov. Cuomo on the State of New York](#)

- [Friedman: The Age of Protest](#)

- [The End: My Motherless Mother](#)

OP-ED CONTRIBUTOR

Doha's Domestic Troubles

By MOHAMED FAHMY

A crackdown on reformers at home tarnishes the image that Qatar spends millions on polishing abroad.



- [Editorial: Lessons From the Cologne Assaults](#)

- [Edsall: The Republican Party's 50-State Solution](#)

- [Taking Note: Readers on the 'Brutalism' of Ted Cruz](#)

32m



The New York Times

Wednesday, January 13, 2016 | [Today's Paper](#) | [Video](#) | [27°F](#) | [Nikkei -3.86% ↓](#)[World](#) [U.S.](#) [Politics](#) [N.Y.](#) [Business](#) [Opinion](#) [Tech](#) [Science](#) [Health](#) [Sports](#) [Arts](#) [Style](#) [Food](#) [Travel](#) [Magazine](#) [T Magazine](#) [Real Estate](#) [ALL](#)

Cruz Did Not Report Loan From Goldman in Senate Race

By MIKE McINTIRE 17 minutes ago

As Ted Cruz tells it, loyalty and sacrifice helped finance his 2012 Senate bid in Texas. Turns out, a Goldman Sachs loan did as well, but it does not appear in reports filed with the Federal Election Commission.

- [Trump's Iowa Organization Still Seems an Afterthought](#)
- [Nikki Haley Turns on Trump in Rebuttal Speech](#)

30 minutes ago



Supporters of the right-wing group Pegida marching this week in Leipzig, Germany. Jens Schlueter/Getty Images

Fear Widens Divide Over Migrant Crisis

By JIM YARDLEY 3:56 PM ET

Anti-immigration groups and right-wing extremists have seized

The Opinion Pages

Iraq and the Kurds Are Going Broke

By THE EDITORIAL BOARD

Low oil prices could seriously damage the effort to defeat the Islamic State.



- [Editorial: Gov. Cuomo on the State of New York](#)
- [Friedman: The Age of Protest](#)
- [The End: My Motherless Mother](#)

OP-ED CONTRIBUTOR Doha's Domestic Troubles

By MOHAMED FAHMY

A crackdown on reformers at home tarnishes the image that Qatar spends millions on polishing abroad.



- [Editorial: Lessons From the Cologne Assaults](#)
- [Edsall: The Republican Party's 50-State Solution](#)
- [Taking Note: Readers on the 'Brutalism' of Ted Cruz](#)

32m



The New York Times

Wednesday, January 13, 2016 | [Today's Paper](#) | [Video](#) | [27°F](#) | [Nikkei -3.86% ↓](#)

World U.S. Politics N.Y. Business Opinion Tech Science Health Sports Arts Style Food Travel Magazine T Magazine Real Estate ALL

Cruz Did Not Report Loan From Goldman in Senate Race

By MIKE McINTIRE 17 minutes ago

As Ted Cruz tells it, loyalty and sacrifice helped finance his 2012 Senate bid in Texas. Turns out, a Goldman Sachs loan did as well, but it does not appear in reports filed with the Federal Election Commission.

- [Trump's Iowa Organization Still Seems an Afterthought](#)
- [Nikki Haley Turns on Trump in Rebuttal Speech](#)

30 minutes ago



Supporters of the right-wing group Pegida marching this week in Leipzig, Germany. Jens Schlueter/Getty Images

Fear Widens Divide Over Migrant Crisis

By JIM YARDLEY 3:56 PM ET

Anti-immigration groups and right-wing extremists have seized

The Opinion Pages

Iraq and the Kurds Are Going Broke

By THE EDITORIAL BOARD

Low oil prices could seriously damage the effort to defeat the Islamic State.



- [Editorial: Gov. Cuomo on the State of New York](#)

- [Friedman: The Age of Protest](#)

- [The End: My Motherless Mother](#)

OP-ED CONTRIBUTOR Doha's Domestic Troubles

By MOHAMED FAHMY

A crackdown on reformers at home tarnishes the image that Qatar spends millions on polishing abroad.



- [Editorial: Lessons From the Cologne Assaults](#)

- [Edsall: The Republican Party's 50-State Solution](#)

- [Taking Note: Readers on the 'Brutalism' of Ted Cruz](#)

32m



The New York Times

Wednesday, January 13, 2016 | [Today's Paper](#) | [Video](#) | [27°F](#) | [Nikkei -3.86% ↓](#)

World U.S. Politics N.Y. Business Opinion Tech Science Health Sports Arts Style Food Travel Magazine T Magazine Real Estate ALL

Cruz Did Not Report Loan From Goldman in Senate Race

By MIKE McINTIRE 17 minutes ago
As Ted Cruz tells it, loyalty and sacrifice helped finance his 2012 Senate bid in Texas. Turns out, a Goldman Sachs loan did as well, but it does not appear in reports filed with the Federal Election Commission.

- [Trump's Iowa Organization Still Seems an Afterthought](#)
- [Nikki Haley Turns on Trump in Rebuttal Speech](#)

30 minutes ago



Supporters of the right-wing group Pegida marching this week in Leipzig, Germany. Jens Schlueter/Getty Images

Fear Widens Divide Over Migrant Crisis

By JIM YARDLEY 3:56 PM ET

Anti-immigration groups and right-wing extremists have seized

The Opinion Pages

Iraq and the Kurds Are Going Broke

By THE EDITORIAL BOARD

Low oil prices could seriously damage the effort to defeat the Islamic State.



[Editorial: Gov. Cuomo on the State of New York](#)

[Friedman: The Age of Protest](#)

[The End: My Motherless Mother](#)

OP-ED CONTRIBUTOR Doha's Domestic Troubles

By MOHAMED FAHMY

A crackdown on reformers at home tarnishes the image that Qatar spends millions on polishing abroad.



[Editorial: Lessons From the Cologne Assaults](#)

[Edsall: The Republican Party's 50-State Solution](#)

[Taking Note: Readers on the 'Brutalism' of Ted Cruz](#)

32m



≡ SECTIONS SEARCH

SUBSCRIBE NOW

LOG IN



U.S. INTERNATIONAL 中文

The New York Times

Wednesday, January 13, 2016 | [Today's Paper](#) | [Video](#) | [27°F](#) | [Nikkei -3.86% ↓](#)

World U.S. Politics N.Y. Business Opinion Tech Science Health Sports Arts Style Food Travel Magazine T Magazine Real Estate ALL

Cruz Did Not Report Loan From Goldman in Senate Race

By MIKE McINTIRE 17 minutes ago
As Ted Cruz tells it, loyalty and sacrifice helped finance his 2012 Senate bid in Texas. Turns out, a Goldman Sachs loan did as well, but it does not appear in reports filed with the Federal Election Commission.

- Trump's Iowa Organization Still Seems an Afterthought
- Nikki Haley Turns on Trump in Rebuttal Speech

30 minutes ago



Supporters of the right-wing group Pegida marching this week in Leipzig, Germany. Jens Schlueter/Getty Images

Fear Widens Divide Over Migrant Crisis

By JIM YARDLEY 3:56 PM ET

Anti-immigration groups and right-wing extremists have seized

The Opinion Pages

Iraq and the Kurds Are Going Broke

By THE EDITORIAL BOARD

Low oil prices could seriously damage the effort to defeat the Islamic State.



[Editorial: Gov. Cuomo on the State of New York](#)

[Friedman: The Age of Protest](#)

[The End: My Motherless Mother](#)

OP-ED CONTRIBUTOR Doha's Domestic Troubles

By MOHAMED FAHMY

A crackdown on reformers at home tarnishes the image that Qatar spends millions on polishing abroad.



[Editorial: Lessons From the Cologne Assaults](#)

[Edsall: The Republican Party's 50-State Solution](#)

[Taking Note: Readers on the 'Brutalism' of Ted Cruz](#)

32m



Basic web page

- Open your favorite text editor (**I use Brackets**) and choose Syntax as html, type the following:

```
<!DOCTYPE html>
<html>
  <head> My page </head>
  <body>
    <h1> Bio</h1>
        <p> Write something here. </p>
    </body>
</html>
```

- Save the file as a myfirst.html
- Open myfirst.html file using Chrome browser or any other default browser
- Just click the file

HTML Elements

- Element is a pair of tags and the content between them.
`<p>content </p>` is a paragraph element.
- Elements can have empty content and be closed in start tag.

`
` defines a new line.

HTML Elements

- <html> Root of HTML Document
- <body> Document Body
- <head> Information about the doc
- <h1>, <h2>, <h3>... Header Tags
- <p> Paragraph Tag
- Image
- <a> Hyperlink
- <div> Section in a Document
- Section in a Document (text)
- unordered list
 - list items

Web Page Meta data

```
<head>
  <meta charset="utf-8">
  <title> My webpage </title>
</head>
```

HTML

Here the <meta> element specifies the document character encoding.

Many <meta> elements include name and content attributes.

```
<meta name="author" content="Java, textbook">
```

HTML

Specify author is useful for automatically extract author info

More on [meta data](#)

Page Title: <title>

```
<head>
<title>
    The New York Times -Breaking
news, World News & Multimedia
</title>
</head>
```

HTML

- Placed within the <head> of the page.
- Displayed in the web browser's title bar and when bookmarking the page, otherwise not visible to the user as page content.

Paragraph: <p>

```
<p> You 're not your job </p>
<p> You 're not how much money you
make in the bank</p>
<p> you are not the car you drive</p>
```

HTML

You 're not your job

You 're not how much money you make in the bank

you are not the car you drive

- Placed within the <body> of the page.
- [More paragraph examples](#)

Headings: <h1>,<h2>,...,<h6>

headings separate major areas of the page (block)

```
<h1>University of Neverland</h1>
<h2>Department of Computer Science</h2>
<h3>Sponsored by Micro$oft</h3>
```

HTML

University of Neverland
Department of Computer Science
Sponsored by Micro\$oft

output

- [More heading examples.](#)

`<header>` and `<footer>`

`<header>` tags usually contain one or more `<h1-6>` elements, maybe a logo, and authorship information.

`<footer>` tags might contain site map links, authorship information, copy right information, etc.

```
<header> more html elements </header>
      ...maybe some other stuff...
<footer> more html elements, copyright @ </footer>
```

`HTML`

These tags are both block element

Note: not to be confused with the `<head>` tag, `<header>` is designed to contain headings for a document.

[Usage of `<header>`](#)

<article> and <section>

The <article> tag is a standalone piece of content (e.g. entire blog post, news story, etc) (block)

The <section> tag is a piece of content that doesn't make sense on its own(a chapter, paragraph, etc)(block).

```
<article>
  <h2>George's Resume
  </h2>
  <section>
    <h3>Objective:</h3>
  </section>
  <section>
    <h3>Work Experience:</h3>
  </section>
  <section>
    <h3>Education:</h3>
  </section>
</article>
```

Horizontal rule: <hr>

a horizontal line to visually separate sections of a page (block)

```
<p>First paragraph</p>
  <hr>
  <p>Second paragraph</p>
  <hr>
  <p>Third paragraph</p>
```

HTML

First paragraph

Second paragraph

Third paragraph

This is the first example we've seen of a void (self-closing) tag: [more on HTML tag types](#).

Links: <a>

links, or “anchors”, to other pages(inline)

```
<P>
```

Search for it on Google

```
</P>
```

HTML

Search for it on [Google](http://www.google.com/)

Output

Use the href attribute to specify the destination URL

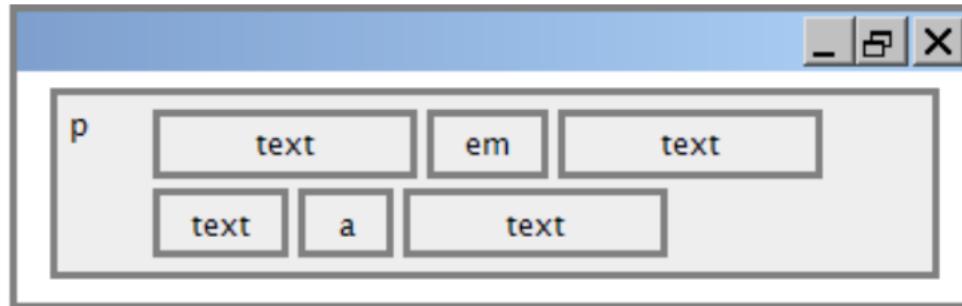
- Can be absolute (to another website) or relative (to another page on this site).

Anchors are inline elements; must be placed in block element such as <p> or <h1>

More about HTML attributes

- **Some tags can contain additional information called attributes**
 - Syntax:
 - <element attribute='value' attribute='value'> content</element>
 - Example:
 - I am from <a href="<http://www.american.edu>"> American University in Washington, DC.
- **Some tags don't' contain content and can be opened and closed in one tag**
 - Syntax:
 - <element attribute='value' attribute='value'>
 - Example:
 -
, <hr />,
, <hr>
 - Example:
 -
 - Note: whether you use the '/' in a self-closing tag is up to you, as long as you are consistent.

Block and Inline



- Block elements contain an entire large region of content.
 - Examples: paragraphs, lists, table cells.
 - The browser places a margin of white space between block elements for separation.
- Inline elements affects a small amount of content.
 - Examples: bold txt, code fragments, images.
 - The browser allows many inline elements to appear on the same line.
 - Must be nested a block element.

Exceptions and rules

- Block vs. inline:
 - Some block elements can contain only other block elements: <body>, <form>
 - <p> tags can contain only inline elements and plain text
 - Some block elements can contain <div>,
- Some elements are only allowed to contain certain other elements
 - is only allowed to contain
- Some elements are only allowed once per document:
 - <html>
 - <body>
 - <head>
 - <main>

Images:

- Inserts a graphical image onto the page (inline)

```
<img src='images/duck.jpg', alt= 'giant yellow du'>
```

HTML



output

- The src attribute specifies the image URL
- HTML5 also requires an alt attribute describing the image, which improves accessibility for users who can't otherwise see it.
- If put in a <a> anchor tag, the image becomes a link.

Line Break:

forces a line break in the middle of a block element (inline)

```
<p>
    Among twenty snowy mountains,<br>
        The only moving thing <br>
            Was the eye of the blackbird.
</p>
```

HTML

```
Among twenty snowy mountains,
The only moving thing
Was the eye of the blackbird.
```

OUTPUT

Warning: Don't over-use br (guideline: >=2 in a row is bad, better not to use any)

br tags should not be used to separate paragraphs or uses multiple times in a row to create spacing.

Nesting Tags

```
<p>HTML is <em>really, <strong> REALLY</em>  
    lots of <strong> fun!  
</p>
```

HTML bad

```
<p>HTML is <em>Really </em> , <strong> lots of </strong> fun!  
</p>
```

HTML good

Tags must be correctly nested.

- A closing tag must match the most recently opened tag.

The browser may render it correctly anyway, but it is invalid HTML

Comments: <!-- ...>

comments do document your HTML file

```
<!-- My first web page.      -->  
<p> CSC Courses are so much fun!
```

HTML

```
CSC Courses are so much fun!
```

OUTPUT

Many web pages are not thoroughly commented(or at all).

Comments are useful at top fo page and for disabling code.

Comments can't be nested and cannot contain a “—”

Do not leave commented-out HMTL code in your homework.

Toggle block comment in Brackets: option+command+/

Toggle line comments in Brackets: command +/

Web Standards

- It is important to write proper HMTL code and.
- Why use valid HMTL and web standards?
- More rigid and structured language
- More interoperable across different web browsers
- More Likely that our pages will display correctly in the future
- can be interchanged with other XML data: [SVG](#) (graphics), [MathML](#), [MusicML](#), etc.
- Do the proper HTML code for your homework!!
Meet the official standards.

W3C HTML Validator

Check <http://validator.w3.org/>

Checks your HTML code to make sure it follows the official HTML syntax.

More picky than the browser, which may render bad HTML correctly.

Unordered List: ,

ul represents a bulleted list of items(block)

li represents a single items within the list (block)

```
<ul> vacation
    <li> no cell phone
    </li>
    <li> no computer
    </li>
    <li> no newspaper
    </li>
</ul>
```

HTML

```
vacation
no cell phone
no computer
no newspaper
```

OUTPUT

Nested List

```
<ul>
    <li> TVs
        <ul>
            <li> The Walking Dead
            </li>
            <li> Mad Men
            </li>
        </ul>
    </li>
    <li> Movies
        <ul>
            <li>Call mM by Your
Name</li>
            <li>Blade Runner</li>

        </ul>
    </li>
</ul>
```

HTML

- TVs
 - The Walking Dead
 - Mad Men
- Movies
 - Call mM by Your Name
 - Blade Runner

OUTPUT

Definition list: <dl>, <dt>, <dd>

```
<dl>
    <dt>newbie</dt>
        <dd>one who does not
have mad skills
    </dd>
    <dt>own</dt>
        <dd>to soundly
defeat (e.g. I owned that
newbie!)</dd>
    <dt>frag</dt>
        <dd>a kill in a
shooting game</dd>
</dl>
```

HTML

newbie

one who does not have mad skills

own

to soundly defeat (e.g. I owned that newbie!)

frag

a kill in a shooting game

OUTPUT

Computer Code: <code>

a short section of computer code (usually with fixed width)

```
<p>
    The <code>ul</code> and
<code>ol</code> tags make lists.
</p>
```

HTML

The `ul` and `ol` tags make lists.

Output

Preformatted Text: <pre>

a short section of computer code (usually with fixed width)

```
<pre>
    Fame is but a fruit tree
        So very unsound
        It can never flourish
        Till its stalk is in the ground
</pre>
```

HTML

```
Fame is but a fruit tree
    So very unsound
    It can never flourish
Till its stalk is in the ground
```

Output

Quiz

- What will happen if you forgot the closing tag of in the following paragraph:

I am from <a href="<http://www.american.edu>"> American University
in Washington, DC.

Quiz

- What will happen if you removing http:// in the URL you give to the href, For example:
`new york times`

Try it out yourself.

HTML Exercise 1: About me

- Create a page `aboutme.html` that describes you, including the information such as:
- Your name
- A brief description of you in 1-2 sentences
- A list of classes you are taking now at AU
- Your 4 favorite movies, books, games and TV shows. Make at least one link to an interesting site about that favorite movie/book/game/show.
- Two images that represent when you're happy and sad.
- Something about one of your neighbors (student sitting next to you)
- Hint: use proper header tags, unordered lists, ordered lists.
- We will learn how to stylize this page next class.

HTML Exercise 1: Example

About Bei Xiao

My name is Bei Xiao and I am **jolly, clumsy, and four-eyed.**

My Classes This Semester

- Web Programming
- Machine Learning with Deep Neural Networks
- 16th Century Counterpoints
- Graduate Seminar: The Difference Between Humans and Robots.
- French New Wave Cinema

My Favourite Movies

I actually dont have time to watch movies, so....here goes!

1. Paterson [IMDB](#)
2. Arrival [IMDB](#)

My Favourite TV shows

I actually dont have time to watch movies, so....here goes!

1. South park [IMDB](#)
2. Grace and Frankie [IMDB](#)

My trip this summer



Exercise

- Make the following images clickable and bring it to the Wikipedia pages of these three cities.

My trip this summer

