

CET214

Web Programming

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CET214

Web Programming

Lecture 1: Introduction, the Internet, and Basic HTML

Today's Agenda

Introductions

Course Overview

Webpages and The Internet

Course Grading

Grades will be structured as:

- 20% Homeworks
- 20% Project (5% before Midterm & 15% before final)
- 20% Quizzes
- 15% Midterm
- 25% Final

What This Class is About:

An overview of how the Internet works

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...and overall, building design/development strategies across the "full-stack"

The end result? A better understanding of the web, important technologies,
and a portfolio for you to show!

Course Modules

1. Introduction to Web Programming
2. Webpage structure and appearance with **HTML5** and **CSS**.
3. **HTML5** Tags
4. **CSS**
5. **CSS**: properties and selectors
6. Basic of **Javascript**
7. **Javascript** objects
8. Understand DOM
9. Event-driven programming
10. Basics of **PHP**
11. Form handling and DB access in **PHP**
12. Introduction to Ajax

Web Development Tools

We will be using the following web development tools:

- A browser to view and debug webpages
 - Chrome,
 - Edge,
 - Firefox,
 - ...
- IDE: a text editor to write HTML/CSS/JS/...
 - "VSCode (with various helpful packages available),
 - WebStorm,
 - Text Editors: Notepad, Notepad++, ...
 - ...

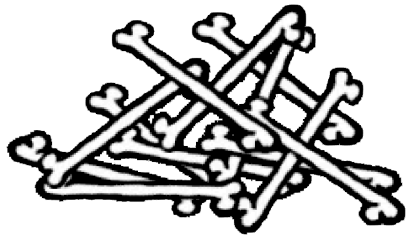
So, what is a web page, really?

Content

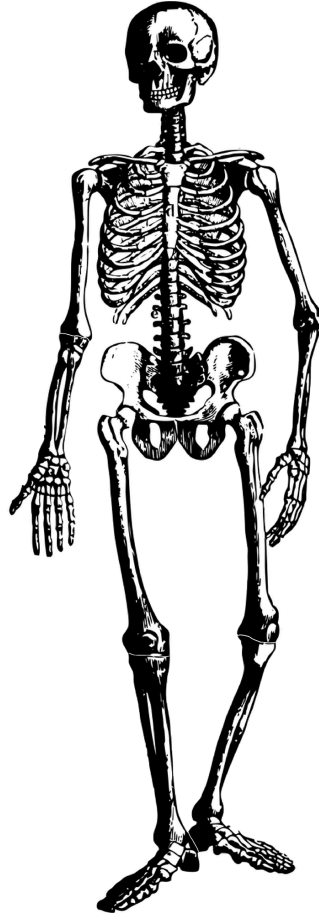
Structure

Style

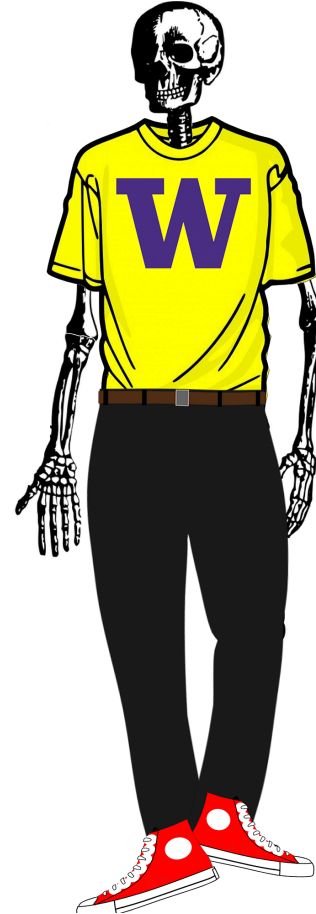
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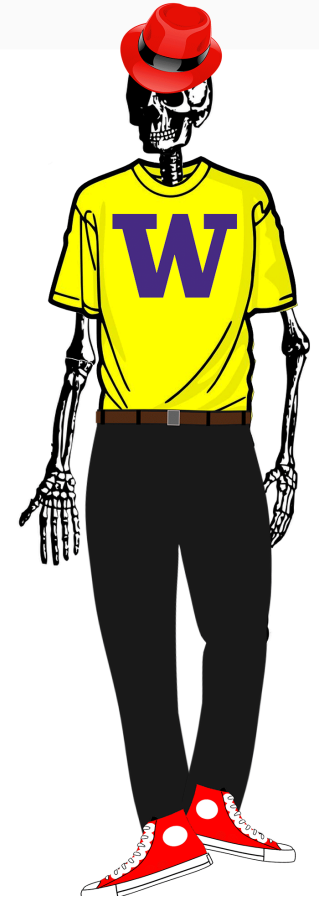
Words and images



HTML



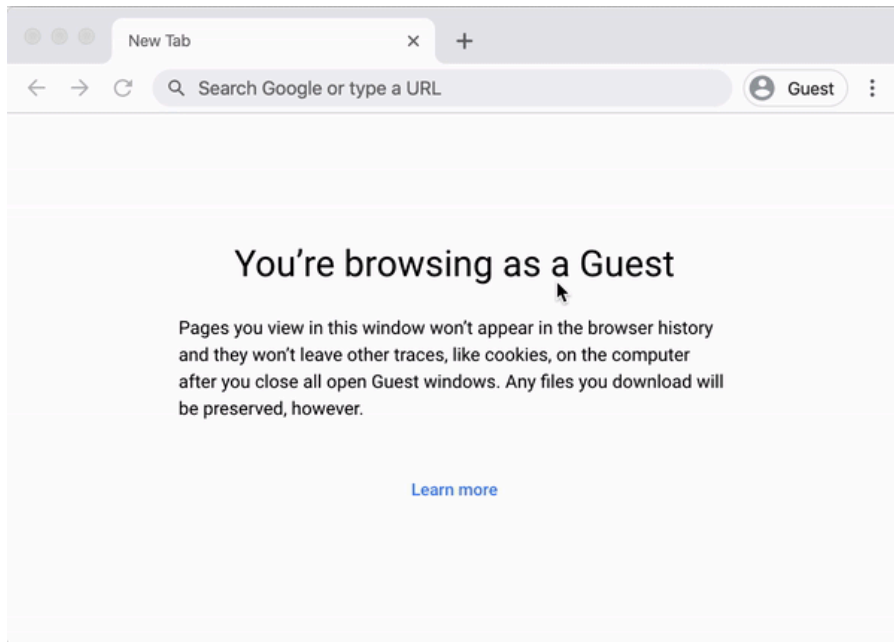
CSS



Javascript

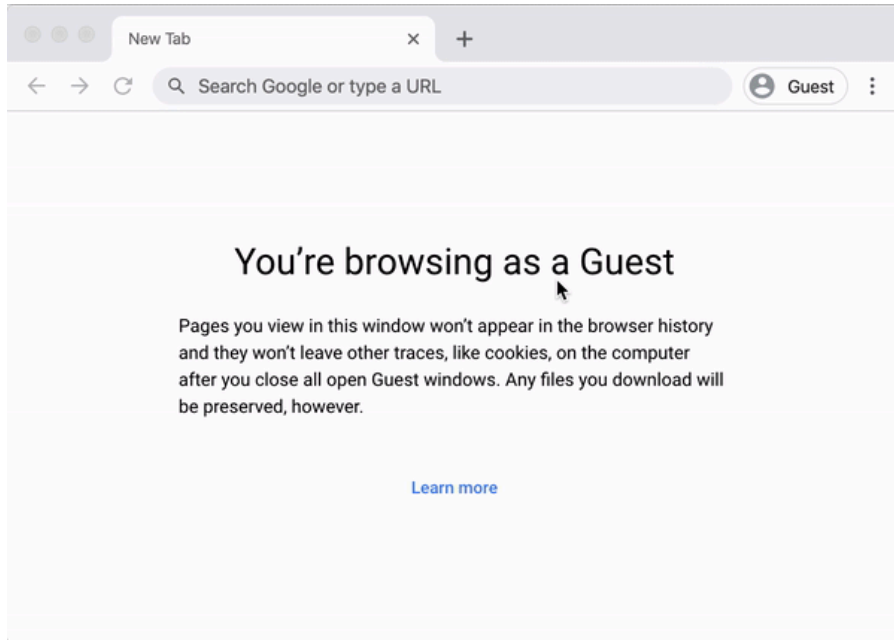
Ok, but what is it really?

What's everything involved here?



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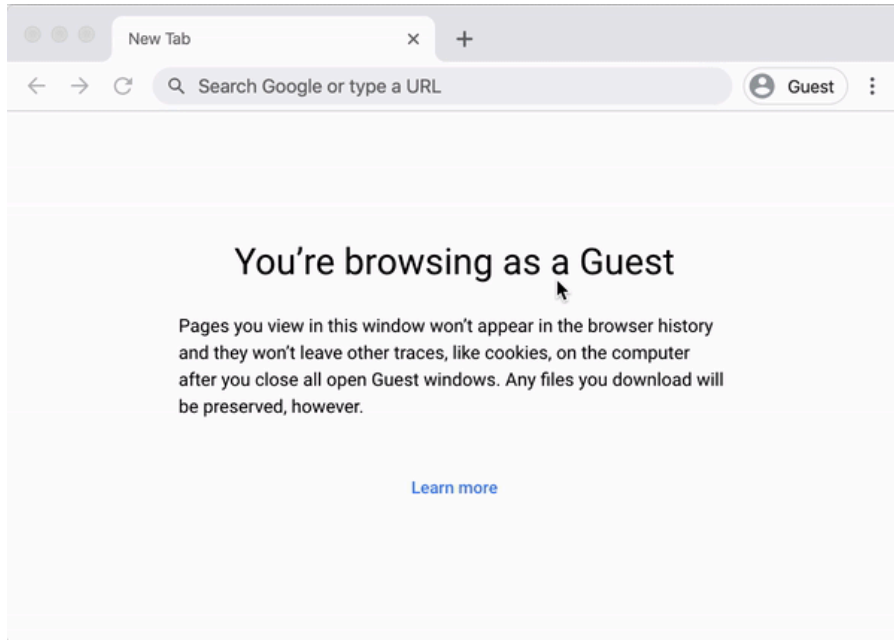


It's just this, right?

1. Decide on URL...
2. Type it in...
3. Hit enter...
4. Website loads!

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It's just this, right?

1. Decide on URL...
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But what happens between 3 and 4?

What happens in that half second?

You don't have Google.com on your computer. So, where does it come from?

1. Figure out where it is
2. Ask for it to be sent to us
3. Check and verify what we get
4. Show it

That thing in the address bar. Where is the website?

Uniform Resource Locator (URL): An identifier for the location of a document

A couple of basic URLs:

```
https://sut.edu.eg/academics/
```

```
~~~~~      ~~~~~~      ~~~~~~
```

```
protocol      host      path
```

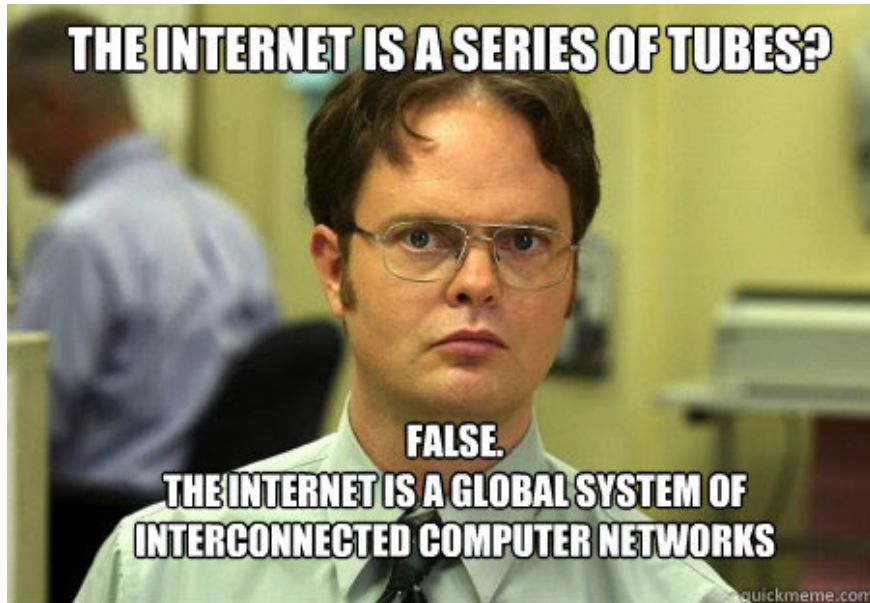
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That looks good, but again: where and how?

The Internet



Wikipedia:

<http://en.wikipedia.org/wiki/internet>

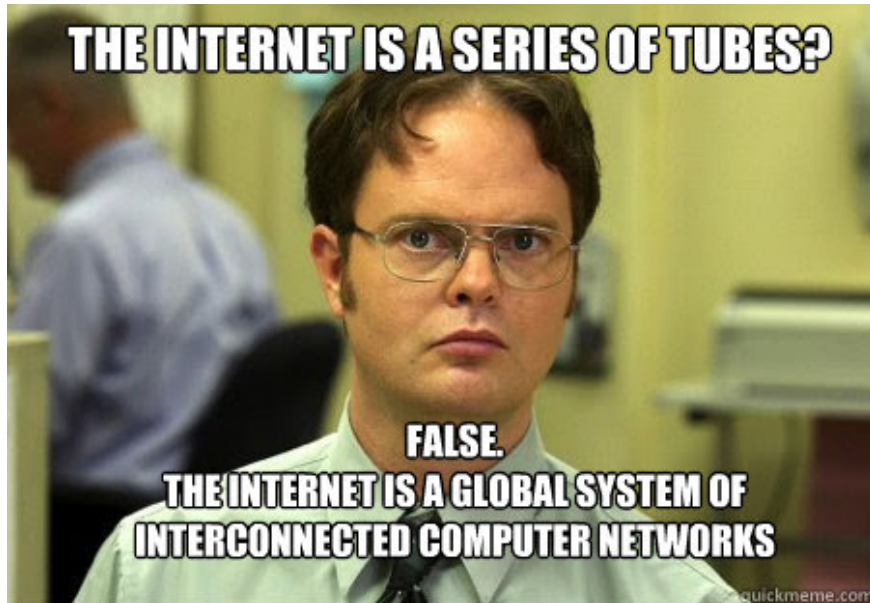
A connection of computer networks built on the Internet Protocol (IP)

Every computer has an "IP" address:

- E.g.,: 34.215.139.216
- Find yours with WhatsMyIP.org

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So what's the difference between the Internet and the World Wide Web (WWW)?

Internet vs. "The Web"

Internet

- Computers (servers) connected to each other via a series of networks
- Powered by layers upon layers:
 - Physical: The cables between them
 - Data & Network: The [small] packets of information
 - Transport (TCP/IP): Providing connections and reliability
 - Application: Tying everything together to be useful

WWW

- Collection of pages of information
- Text... but with some "Hyper" around it
- Pages can link to each other
- Pages have style and interactivity

History of the Internet

- Started in the 1960s as a project of the US Department of Defense
- ARPANET was the first network to use the Internet Protocol Suite (TCP/IP)
- WWW was created in 1989 by Tim Berners-Lee
- First web browser was released in 1993 (NCSA)
- First web server was released in 1991 (CERN)
- Before **Web 2.0**, Web was a warehouse of static pages
- Web 1.0?

History of the Internet

Web 1.0 (1990-2004)

Static Websites

Emails

Forums

Basic Search Engines

Newsletters

...

Web 2.0 (2004-now)

Dynamic Websites (Blogs, ...)

Social Networks

Wikis

Advanced Search Engines

Audio/Video Streaming

...

Web 1.0.
1990 - 2004



Web 2.0.
2004 - The Present



History of the Internet

Web 3.0?

Web3

2014 - The Future?



Remember that URL? `https://google.com/`

Need to go out to the internet to get the webpage.

Internet is low-level: based on numbers (IP addresses), not names.

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Domain Name System (DNS)

A Domain Name System translates human-readable names to IP addresses

- Example: `sut.edu.eg` → `104.152.168.9`
 - Hostname of `sut.edu.eg` (which we might put into the browser's address bar)
 - ... has IP address of `104.152.168.9` (which will be used to contact the server via the internet)

More of the URL than the host

```
https://sut.edu.eg/academics/aritifical-intelligence
~~~~~
protocol      host      path
```

We've handled the host to IP address (so we know who to ask for the web page)

The "protocol" tells us how:

- **HTTP**: HyperText Transfer Protocol
- Gives us the instructions (protocols) for how to share (transfer) web content ("hyper" text)

And the path tells us what:

- From the sut.edu.eg server...
- I'd like the thing called `academics/aritifical-intelligence`...

HTTP Error Codes

When something goes wrong, the web server returns a special "error code" number to the browser, possibly followed by an HTML document

Common Error Codes:

Number	Meaning
200	OK
301-303	page has moved (permanently or temporarily)
403	you are forbidden to access this page
404	page not found
418	I'm a teapot (fun fact , example)
500	internal server error

[Complete list](#)

The Real Innovation

HTTP built resilience into the internet by creating the 404.

A website will always give a response, even if what a user wants isn't found.

Examples:

- [ACM's 404](#)
- [Discord](#)
- [Android](#)
- [GitHub](#)

Then... we have the web page right?

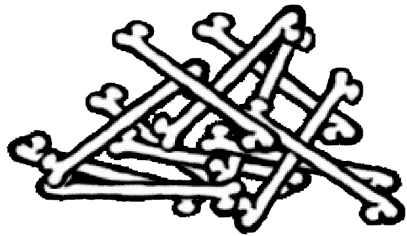
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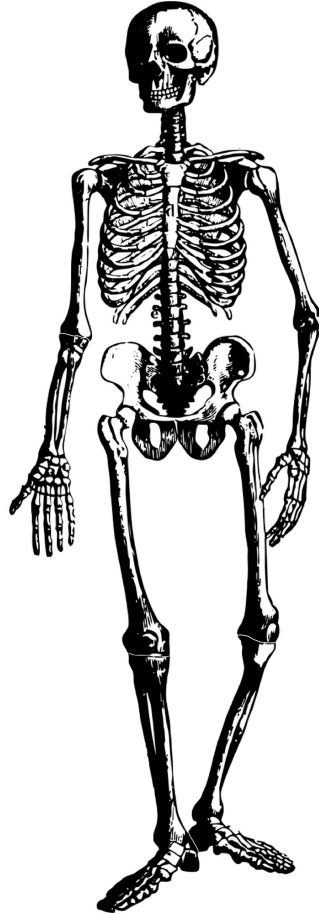
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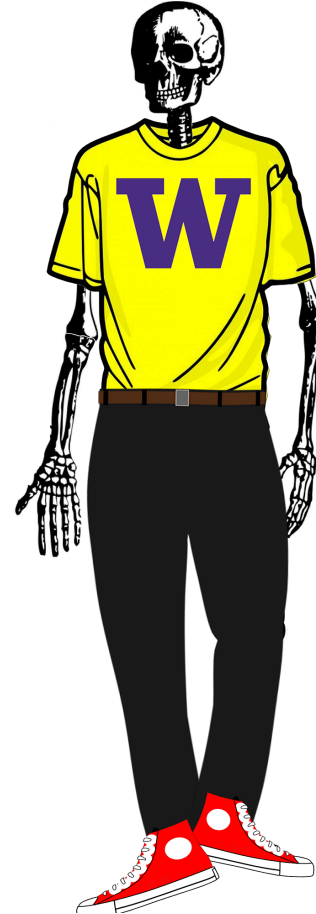
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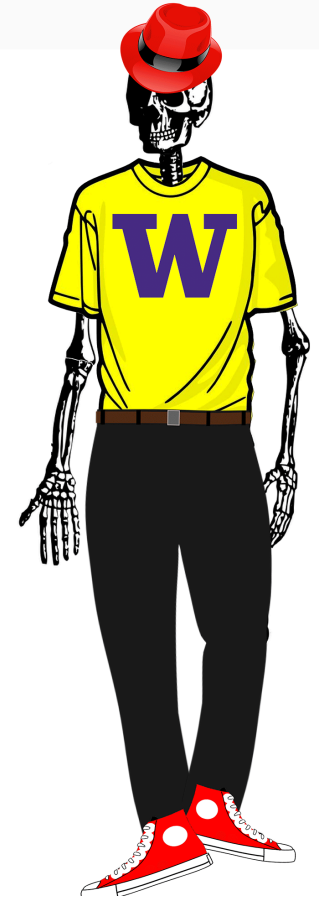
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HTML



CSS



JavaScript

What's in a Web Page

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Hypertext Markup Language (HTML): semantic markup for web page content

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Asynchronous Javascript and XML: fetching data from web services using
Javascript fetch API

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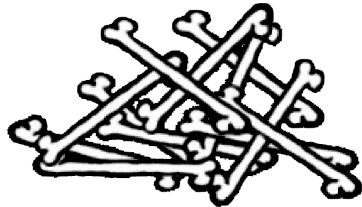
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[Javascript fetch API](#)

Javascript Object Notation (JSON): file format for organizing human-readable data

Content



Words and images

The Lion King - Rancid Tomatoes
The Lion King (1994)

92%

Between traumas, the movie serves up soothingly banal musical numbers (composed by Elton John and Tim Rice) and silly, rambunctious comedy.

Terrence Rafferty

Disney can take pride in this lion of a movie.

Dennis King

Although far from the worst offender in Disney's canon, The Lion King is nevertheless host to many of the less savory qualities common to the studio's output.

Rob Humanick

Slant Magazine

A computer-animated scene featuring a stampede of wildebeest is positively breathtaking.

Desson Thomson

Art History stands out as one of Joe Swanberg's most visually and conceptually accomplished experiments.

Jesse Cataldo

I really couldn't see what all the fuss was about

Mary C (unemployed)

Although it's state of the art, one might say that in terms of its values, it's the best animated film of the 19th century.

Stephen Hunter

A classic story told through immersive visuals, great voice work and some of the most memorable songs in movie history. The Lion King defines animated classic.

R. L. Shaffer

YOUR REVIEW HERE

NAME

YOUR REVIEW HERE

NAME

STARRING

Matthew Broderick Jeremy Irons James Earl Jones Moira Kelly

DIRECTORS

Roger Allen, Rob Minkoff

RATING

G

THEATRICAL RELEASE

Jun 15, 1994

MOVIE SYNOPSIS

One of the most popular Disney animated musicals, The Lion King presents the story of a lion cub's journey to adulthood and acceptance of his royal destiny.

MPAA RATING

G, for animated action violence, some scary cartoon images

STUDIO

Buena Vista

RUNTIME

87 mins

GENRE

Action/Adventure, Animation, Drama, Childrens, Musical and Performing Arts

BOX OFFICE

\$94,240,635

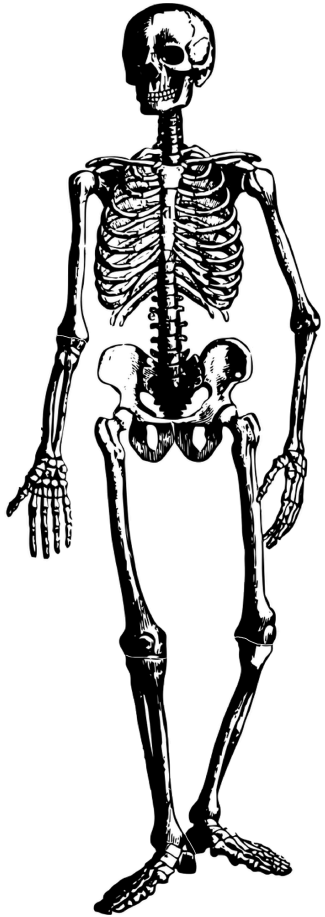
LINKS

The Official The Lion King Site

RT Review

RT Home

(1-10) of 88



HTML

History of HTML

1991	HTML first published	
1995	HTML 2.0	
1997	HTML 3.2	
1999	HTML 4.01	After HTML 4.01 was released, focus shifted to XHTML and its stricter standards
2000	XHTML 1.0	
2002		
	XHTML 2.0	XHTML 2.0 had even stricter standards than 1.0, rejecting web pages that did not comply. It fell out of favor gradually and was abandoned completely in 2009.
2009		
2012	HTML 5	<p>HTML5 is much more tolerant and can handle markup from all the prior versions.</p> <p>Though HTML5 was published officially in 2012, it has been in development since 2004.</p>

Getting Started with HTML

There are *many* different types of HTML tags used to structure web pages (we can't possibly cover all of them within class).

you can find a comprehensive list [on MDN](#)

You are not expected to memorize these! You'll all get more practice in sections :)

Hypertext Markup Language (HTML)

Describes the *content* and *structure* of information on a web page

- Not the same as the *presentation* (appearance on screen)

Surrounds text content with opening and closing **tags**

Each tag's name is called an **element**

- Syntax: `<element> content </element>`
- Example: `<p>This is a paragraph</p>`

Most whitespace is insignificant in HTML (ignored or collapsed to a single space)

We will use a newer version called HTML5

Structure of an HTML Page

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

HTML

An HTML page is saved into a file ending with extension `.html`

The `<head>` tag describes the page and the `<body>` tag contains the page's content

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

Let's start with a [template](#)!

HTML Tag Attributes

Some tags can contain additional information called **attributes**

- Syntax:

```
<element attribute="value" attribute="value"> content </element>
```

- Example:

```
<a href="page2.html">Next page</a>
```

Some tags don't contain content and can be opened and closed in one tag

- Syntax:

```
<element attribute="value" attribute="value">
```

- Example:

```
<br>, <hr>
```

- Example:

```

```

Comments: `<!-- ... -->`

comments to document your HTML file or "comment out" text

```
<!-- My fancy web page!  
      Web Programming, Spring 20xx      -->  
<p>HTML is<!-- a lot of --> fun!</p>
```

HTML

HTML is fun!

output

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

Still useful at top of page and for disabling code

Comments cannot be nested and cannot contain a `--`

Do not leave commented-out HTML code in your homework assignments!

Looking Ahead

Setting up your computer with VSCode or any other text editor/IDE