

How do we create websites?

There are several 'software tools' that we'll need this semester to create our web pages/sites

None of them are particularly special, but all are needed

Later in this lecture, we'll show you a website that will let you pick the applications you want (all we need, except one) and download/install them all at once

...which is nice

How do we create websites?

So what do you need to make a web page?

A text editor

That's it

For a couple of years, I used Notepad for making web pages, before I discovered Microsoft FrontPage - but that's another story

After all, as we'll soon see, an HTML page is just a text file

How do we create websites?

A text editor:



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Visual Studio Code

This semester we'll be using Microsoft's Visual Studio Code for our work

Arguably the best Integrated Development Environment

Free

Lots of nice features

Available from <https://code.visualstudio.com/download>



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But you said we need several tools?
What gives?

Well, yeah

But to make a simple page, we just need an editor

What if we want to view the page?

What if we want to add pictures?

What if we want other people to see our page?

What if we want to share our source code with others?

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To view a page

We'll need a browser

As you know, a web browser is an application used to, well, browse the web

There are many flavors

You're likely most familiar with Internet Explorer - Ewwwww!



All of the development for this site was done using Google Chrome



Much of it was tested with Firefox as well



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What about pictures?

Though Photoshop is probably the best photo editor, we'll be using GIMP
Gnu Image Manipulation Program

Open source photo editor (free)

Almost as good as PS (some argue better)

Plenty good enough for our needs, as we'll see



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What about sharing (publishing)?

This is where it sometimes gets a little confusing for students

To 'publish' our finished pages, we have to upload them to a server account

You all (I hope!) already have accounts on the class web server

We will be using an application called FileZilla to transfer/upload our work to the server

FileZilla uses an Internet technology called the File Transfer Protocol to move files from one computer



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What about sharing source code and files?

A lot of times, we want to be able to conveniently share and distribute projects

To do so, we typically create a compressed archive of the files, called a .zip file

A lot of your lab activities are going to start with one or several files that are partially completed

You'll download the archive to your working directory and extract (or 'unzip') the files from the archive



Ninite

Now, you could go to the websites for all of these applications, download their respective install files, and run each

That would work. But there's an easier way

There's a site named ninite.com. On ninite.com, you can select any number of open-source applications, download them as an executable bundle, and install them all with one double-click

On ninite.com, find and select Chrome (if you don't already have it), FileZilla, GIMP, 7-Zip, and any other application you think you might find useful. Click 'Get Your Ninite' to download the bundle



File Explorer



We'll also use File Explorer a lot to organize our files and folders/subfolders

Obviously, it comes packaged with Windows (I hope you're using a Windows machine... Apple makes things a little tougher for this class)

Understanding file systems is a critical component of computing, in general, and web development in particular

That's it!

So that's it for the software applications we will need this semester

You may have found some others that you'll find useful in the future

If, at the end of the semester, you decide you won't be using them anymore (I doubt it!), you can always uninstall them

There're a bunch that I use all the time

Operating Systems

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Operating Systems

Wait...isn't that another class?

Well, yes

But we have to understand that we're using two operating systems this semester

What is an operating system, you ask?

Well, for now, it's enough to know that an operating system is a group of software applications that provide an interface between the user and the computer's underlying hardware

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Operating Systems

Here's where it matters:

Our personal computers run on the Windows operating system (I hope)

The class web server, however, runs on the Linux operating system

Both are similar in some respects, but very different in a couple of key ways

Operating Systems

The most important difference for us is case sensitivity

Windows doesn't care

Linux **very much** does -

- On a Windows machine, index.html and INDEX.HTML refer to the same file

- On a Linux machine, they are treated as different files

So when you upload your work to the web server, it is **very important** that the file and folder names obey Linux's constraints

Operating Systems

The easiest way to deal with this disparity is to adopt a convention

An agreement at the beginning of things to do the same things the same way, every time

Our convention, for this class, is to name everything in **all lower-case letters**

lab1.html NOT **Lab1.html** OR **LAB1.HTML** OR **lab1.HTML**

Or **ANY** uppercase character

Operating Systems

Also, we only want to use non-space characters in file/folder names

NO SPACES!

EVER!

lab1.html

NOT

lab 1.html

Operating Systems

Also, also ... '/' means something to Linux

It's sort of the same thing as 'C:\' in Windows

So, '/' is your root directory. It's your home

You'll have a couple of subdirectories - directories that are nested inside '/'

Operating Systems

There's **/homework**

And

/labs

And

/images

And

/scripts

Operating Systems

Don't mess with anything in

/js or **/images**

Those files are there to help you troubleshoot your files and help me grade your work

You'll be adding subdirectories to **/homework** and **/labs**

One each for each assignment

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Operating Systems

This may sound kind of trivial

But, trust me, you'll dodge a lot of errors if you follow these conventions

If you're interested in learning more about the nuances of Linux... join me for CSCI 2200 (Intro to Unix) and CSCI 4417 (Intro to System Administration)

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HTML

What is HTML again?

HTML (Hypertext Markup Language)

“language of the web”

set of “tags” or “elements” designed to create the structure of a web page

HTML documents

“plain text” documents with the elements embedded for formatting

What is HTML again?

Basic HTML pages require no compiling

What is this 'compiling' of which you speak?

Basic HTML documents end in either .htm or .html file extensions

.htm vs .html

So what is the difference between index.htm and index.html?

Basically, just the letter 'l' :-)

The reason for the .htm extension dates back to when certain (*cough, cough...MS-DOS*) Operating Systems only allowed for 3 character extensions

.htm vs .html

In modern times, both .htm and .html behave, display, and act the exact same way

It is best practice to choose one or the other and stick with it

For this class – we will use **.html**

History of HTML

Originally, HTML was based on a language called Standard Generalized Mark-up Language (SGML). SGML is a standard that is defined for a markup language for documents

SGML helps to define elements that indicate which portion of the document is a paragraph, sentence, bolded, etc

It is also hideously complicated

History of HTML

HTML 1 was first released in 1991

Current accepted standard of HTML is **HTML 5**

The final revision and adoption of the standard was in October of 2014
(yes, that means we've had to revise all of our lecture materials)

The [World Wide Web Consortium \(W3C\)](#) is the governing body that determines standards for items such as HTML

History of HTML

All current browsers (latest versions of Internet Explorer, Chrome, Opera, Firefox, Safari, etc) support HTML5



History of HTML

All current browsers (latest versions of Internet Explorer, Chrome, Opera, Firefox, Safari, and, god help us, Edge, etc) support HTML5



HTML Tags

HTML documents are made up of various tags that define how the document will be structured

Tags are contained inside of the `<>` (angle brackets, lt/gt)

The beginning tag: `<tagname>`

The ending tag: `</tagname>`

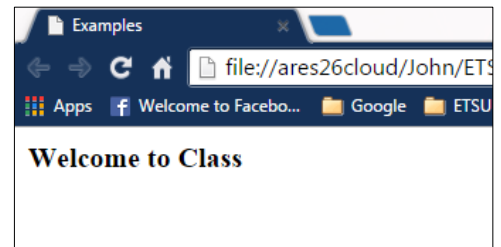
'Forward Slash' ... the one under the question mark key on standard keyboards

HTML Tags

Example: Take the text, "Welcome to Class"

If, in the source document, we wrap that with the bold () tags, thus: Welcome to Class, this is what the browser displays:

```
<!DOCTYPE html>
<html lang="en">
  <head> ...
</head>
  <body>
    <strong>Welcome to Class</strong>
  </body>
</html>
```



HTML Tags

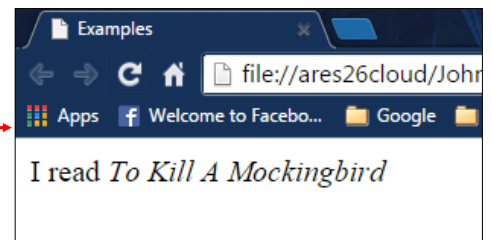
Some tags exist in pairs and are called **container tags**

I read To Kill A Mockingbird

This is the equivalent to "turning on" and "turning off" formatting

If you forget the ending tag, the formatting will continue

```
<!DOCTYPE html>
<html lang="en">
  <head> ...
</head>
  <body>
    I read <em>To Kill a Mockingbird</em>
  </body>
</html>
```



HTML Tags

Some tags do not exist in pairs and are called **standalone tags** (or **void tags**)

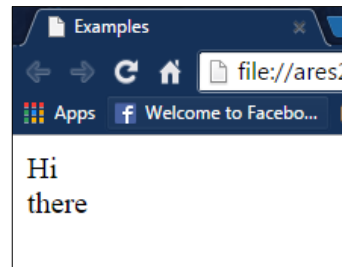
**Hi
 there**

This is the equivalent to inserting something into the document

Does not require an ending tag

Note:
 is also valid, but now discouraged

```
<!DOCTYPE html>
<html lang="en">
  <head> ...
</head>
  <body>
    Hi<br>there
  </body>
</html>
```



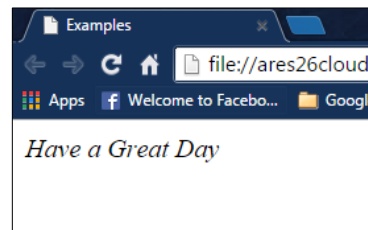
HTML Tags

To italicize "Have a Great Day" -

Use the **** (**emphasis**) tag pair:

Have a Great Day displays

```
<!DOCTYPE html>
<html lang="en">
  <head> ...
</head>
  <body>
    <em>Have a Great Day</em>
  </body>
</html>
```



HTML Tags

`` vs. ``; `` vs. `<i>`

Appearance-wise, `` and `` make text bold; `` vs. `<i>` italicize text

The difference lies in adaptive technology

`` and `` modify the playback voices for screen readers

Sometimes, you may just want to modify text's appearance without the emphasis on the reader's 'voice'

When we talk about CSS, we'll learn that we can (should) use CSS when all we want to do is modify the appearance of text content

HTML Tags

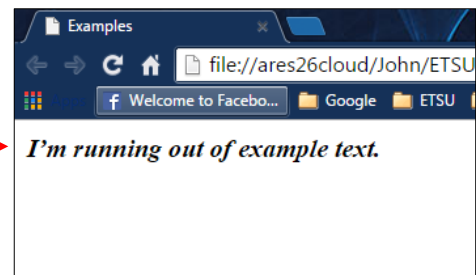
Tags can be nested:

`I'm running out of example text.`

looks like this

(in a browser):

```
<!DOCTYPE html>
<html lang="en">
  <head> ...
</head>
<body>
  <strong><em>
    I'm running out of example text.
  </em></strong>
</body>
</html>
```



HTML Tags

Must use the **last on, first off** method. This is the last tag you have open should be the first tag closed

This would be incorrect:

```
<strong>this is bold <em>this is bold and italic</strong></em>
```

The reason, the last tag "on" or "open" is the tag

Correct this is bold this is bold and italic

this is bold *this is bold and italic*

HTML Tags

While HTML5 tags are not case sensitive (i.e. <HTML> is the same as <html> and <hTmL>), conventional and best practice states that all HTML tags and attributes should be in **lowercase**

HTML Tags

Many HTML tags have **attributes**

Attributes provide additional information about the tag

The attribute(s) are listed inside of the opening tag

With each attribute, you can assign a value with the equals sign followed by the value in quotation marks

```
<tag attribute="value" attribute2="value2">...</tag>
```

HTML Tags

For example:

```
<a href="http://www.cs.etsu.edu">Dept of Computing</a>
```

The <a>... tag is used to create a link in a document. The attribute **href** identifies where a user will go when they click on the link.

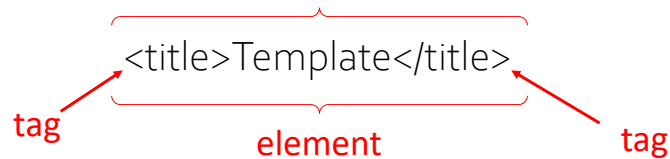
The 'a' in the <a> tag stands for 'anchor'

('href' = 'hypertext reference')

HTML Tags? Or Elements?

Sometimes people will use the terms "tag" and "element" interchangeably

More correct: an element consists of both tags and the content between them



HTML5 Document Structure

DOCTYPE declaration – must be the first thing on the page!
The `<!DOCTYPE>` declaration is not an HTML tag; it is an instruction to the web browser about what version of HTML the page is written in

```
<!DOCTYPE html>
<html lang="en">
  <head>
    <meta charset="utf-8">
    <title>Title of the document</title>
  </head>
  <body>
    CONTENT GOES HERE TO BE DISPLAYED ON THE SCREEN
  </body>
</html>
```

HTML5 Document Structure

To begin an HTML document we start with the `<!DOCTYPE html>` declaration

This declaration is not a tag

Rather it is an indication to the browser that this document is a specific type of HTML

In this case `<!DOCTYPE html>` signifies that this is an HTML5 document

HTML5 Document Structure

HTML 5: `<!DOCTYPE html>`

XHTML (The old standard):

```
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN"
"http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">
```

```
<html xmlns="http://www.w3.org/1999/xhtml">
```


HTML5 Document Structure

The `<html>` container open tag.
The `lang="en"` attribute/value pair tells browsers loading this page that the language on this page is English.

```
<!DOCTYPE html>
<html lang="en">
  <head>
    <meta charset="utf-8">
    <title>Title of the document</title>
  </head>
  <body>
    CONTENT GOES HERE TO BE DISPLAYED ON THE SCREEN
  </body>
</html>
```

HTML5 Document Structure

After the Document Type Declaration, we enter in our first tag – the `<html>...</html>` tags

This tag is used to signify to the browser that everything between the opening and closing of this tag is contained within the HTML element

I think of it as the "html container"

HTML5 Document Structure

The `<head>` tag. Interestingly, the HTML5 specification now makes this tag optional. Since the vast majority of existing web pages use a head section, in this class, we will also

```

<!DOCTYPE html>
<html lang="en">
  <head>
    <meta charset="utf-8">
    <title>Title of the document</title>
  </head>
  <body>
    CONTENT GOES HERE TO BE DISPLAYED ON THE SCREEN
  </body>
</html>

```

HTML5 Document Structure

Inside of the `<html>...</html>` element there are two sections

The first section is `<head>...</head>`

Identifies **descriptors** for the document

This can include scripts, stylesheets, meta information, and the title of the document

HTML5 Document Structure

Meta tag(s). Contain information about the document, but don't display when the page loads

```
<!DOCTYPE html>
<html lang="en">
  <head>
    <meta charset="utf-8">
    <title>Title of the document</title>
  </head>
  <body>
    CONTENT GOES HERE TO BE DISPLAYED ON THE SCREEN
  </body>
</html>
```

HTML5 Document Structure

<meta> tags: provide metadata about the HTML document

Does not display on the page, but can be parsed by other applications, for example, search engines

'meta' means information about the document that's contained within the document

HTML5 Document Structure

```
<head>
  <meta charset="utf-8">
  <title>Title of the document</title>
</head>
```

In the above example, meta is using the attribute `charset` with the value `utf-8`

It is the character encoding of the document

UTF-8 is the web standard*

*utf-8 (Universal Character Set + Transformation Format—8-byte
1,112,064 "characters" can be potentially coded by UTF-8)

HTML5 Document Structure

Other meta tags:

```
<meta name="author" content="Jack Ramsey">
<meta name="description" content="template page">
<meta name="keywords" content="template, starting page">
<meta name="last modified" content="1/21/2016">
<meta http-equiv="refresh" content="30">
```

HTML5 Document Structure

The title tag. All of the pages we create in this class will have titles.

```
<!DOCTYPE html>
<html lang="en">
  <head>
    <meta charset="utf-8">
    <title>Title of the document</title>
  </head>
  <body>
    CONTENT GOES HERE TO BE DISPLAYED ON THE SCREEN
  </body>
</html>
```

HTML5 Document Structure

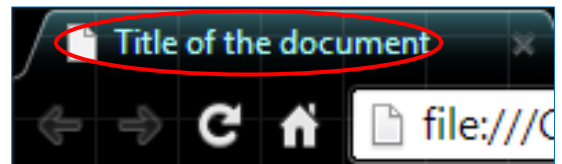
The <title> element: title of the document

Not necessarily the file name or any titles that are used in the document

```
<head>
  <meta charset="UTF-8">
  <title>Title of the document</title>
</head>
```

Always nested inside of the **head** element

Displays in the browser's tab or top bar



HTML5 Document Structure

Closing head tag. The head element is a container element, so it has to have a closing tag

```
<!DOCTYPE html>
<html lang="en">
  <head>
    <meta charset="utf-8">
    <title>Title of the document</title>
  </head>
  <body>
    CONTENT GOES HERE TO BE DISPLAYED ON THE SCREEN
  </body>
</html>
```

HTML5 Document Structure

The body tag. This is where the displayed content will be located

```
<!DOCTYPE html>
<html lang="en">
  <head>
    <meta charset="utf-8">
    <title>Title of the document</title>
  </head>
  <body>
    CONTENT GOES HERE TO BE DISPLAYED ON THE SCREEN
  </body>
</html>
```

HTML5 Document Structure

The second section of the document is the `<body>...</body>`

This section is where various elements, images, tables, forms, text, etc. can be placed to be displayed on the screen

HTML5 Document Structure

`<body>`

CONTENT GOES HERE TO BE DISPLAYED ON THE SCREEN

Can include text, pictures, video, tables, styling code, Javascript, etc.

`</body>`

HTML5 Document Structure

The closing body and html tag. Again, <body> and <html> are container tags, and so they have to be paired with closing tags.

```
<!DOCTYPE html>
<html lang="en">
  <head>
    <meta charset="utf-8">
    <title>Title of the document</title>
  </head>
  <body>
    CONTENT GOES HERE TO BE DISPLAYED ON THE SCREEN
  </body>
</html>
```

About the HTML Document

Text that is not inside of html tags is rendered as "default format" by the browser

Spacing:

Multiple spaces, soft and hard returns, and tabs are ignored by the browser

Whitespace makes the code easier to read, but is ignored by browsers

About the HTML Document

Example of proper spacing:

The indentation of text is intentional and required. It helps to visually identify what is contained within tags that are the next level to the left

Notice the indentation

```

<!DOCTYPE html>
<html lang="en">
  <head>
    <meta charset="utf-8">
    <title>Title of the document</title>
  </head>
  <body>
    CONTENT GOES HERE TO BE DISPLAYED ON THE SCREEN
  </body>
</html>

```

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About the HTML Document

Parent/child relationship:

The indentation causes the elements of the document to take the form of what is referred to as a parent/child relationship. Indented elements are the children of elements that are not indented, or are indented less

```

<!DOCTYPE html>
<html lang="en">
  <head>
    <meta charset="utf-8">
    <title>Title of the document</title>
  </head>
  <body>
    CONTENT GOES HERE TO BE DISPLAYED ON THE SCREEN
  </body>
</html>

```

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About the HTML Document

Parent/child relationship:

```
<!DOCTYPE html>
<html lang="en">
  <head>
    <meta charset="utf-8">
    <title>Title of the document</title>
  </head>
  <body>
    CONTENT GOES HERE TO BE DISPLAYED ON THE SCREEN
  </body>
</html>
```

Thus, in this example, the <head> and <body> elements are children of the <html> element, while the <head> tag is the parent of the <meta> and <title> elements

About the HTML Document

Comments:

```
<!-- this is an example of a comment -->
```

Please note there is a space between after the opening tag and a space before the closing tag

Comments begin with the <!-- opening tag and end with the --> closing tag

About the HTML Document

Comments:

Not displayed to the screen (generally speaking)

Comments are sent to the browser

DO NOT STORE SECURE INFORMATION IN COMMENTS

Passwords, credit card numbers, etc

Can be seen by viewing the page's source

Useful for noting design information and future support of the page

About the HTML Document

Comments – What good are they?

Noting design information

Future support of the page

Page's author may not be the next person who has to modify it

About the HTML Document

Comments:

For the purposes of this class, every document you submit should have the following comments in the <head> section of your document:

```
<!-- lab1.html
-   Author:      Joe Dokes
-   Date:        2023-06-11
-   Last revised: 2023-06-11
-   Description: Gain a basic understanding
-               of HTML
-->
```

ALL OF OUR
ASSIGNMENTS
WILL INCLUDE THE
APPROPRIATE
INFORMATION IN
THEIR HEAD
ELEMENTS

```
<head>
<meta charset="utf-8">
<meta name="author" content="Joe Dokes">
<meta name="date" content="2023-06-11">
<meta name="last revised" content="2023-06-11">
<meta name="description"
      content="Gain a basic understanding of HTML">
<title>Lab 1</title>

<!-- lab1.html
-   Author:      Joe Dokes
-   Date:        2023-06-11
-   Last revised: 2023-06-11
-   Description: Gain a basic understanding
-               of HTML
-->
</head>
```

```

<!DOCTYPE html>
<html lang="en">
  <head>
    <meta charset="utf-8">
    <meta name="author" content="Joe Dokes">
    <meta name="date" content="2023-06-11">
    <meta name="last revised" content="2023-06-11">
    <meta name="description"
      content="Gain a basic understanding of HTML">
    <title>Lab 1</title>

    <!-- lab1.html
      -   Author:           Joe Dokes
      -   Date:            2023-06-11
      -   Last revised:   2023-06-11
      -   Description:    Gain a basic understanding
      -                   of HTML
    -->
  </head>
  <body>
    Content here
  </body>
</html>

```

HTML Terms

Attributes – provide additional information about the tag:

```
<a href="http://www.cs.etsu.edu">Dept of Computing</a>
```

Tags – define the structure of the document:

```
<a href="http://www.cs.etsu.edu">Dept of Computing</a>
```

Elements – includes everything from the opening tag to the closing tag:

```
<a href="http://www.cs.etsu.edu">Dept of Computing</a>
```

Lecture Quiz

1. What information is contained in an HTML document's <head> section?

- A. Meta information
- B. Comments
- C. Links to external resources
- D. Title
- E. All of the above

Lecture Quiz

2. What is the name of the editor we'll be using for this class?

- A. Notepad++
- B. Brackets
- C. Sublime
- D. Vim
- E. Nano
- F. Visual Studio Code

Lecture Quiz

3. Which Operating System will we be interacting with this semester?

- A. Mac OS
- B. Windows
- C. OS/2
- D. MINIX
- E. Linux
- F. B and E above
- G. A and B above

Lecture Quiz

4. Why is it important to use lower-case letters (only) in file & folder names?

- A. Windows is case sensitive
- B. Linux is case sensitive
- C. Mac OS is case sensitive
- D. It isn't important. Don't worry about it

Lecture Quiz

5. HTML documents have to be compiled before they can be viewed
- A. True
 - B. False

Lecture Quiz

6. What is the current "official" version of HTML?
- A. 1
 - B. 2
 - C. 4
 - D. 5
 - E. XHTML

Lecture Quiz

7. Which element could we use to italicize text?

- A. ``
- B. `<it>`
- C. `<i>`
- D. `<italic>`
- E. A & C above

Lecture Quiz

8. In HTML, what is an **attribute**?

- A. Additional information about an element that is enclosed in its opening tag
- B. href
- C. May be required for the element to work
- D. All of the above

Lecture Quiz

9. What's the first thing (line #1) that appears in an HTML document?

- A. <html lang="en">
- B. <!DOCTYPE html>
- C. <head>
- D. <body>

Lecture Quiz

10. In the following screen shot, which element is <title>'s parent?

- A. <html lang="en">
- B. <!DOCTYPE html>
- C. <head>
- D. <body>

```
<!DOCTYPE html>
<html lang="en">
  <head>
    <meta charset="utf-8">
    <title>Title of the document</title>
  </head>
  <body>
    CONTENT GOES HERE TO BE DISPLAYED ON THE SCREEN
  </body>
</html>
```

Lecture Quiz

11. In HTML, what symbols do we use to denote comments?

- A. //
- B. /* */
- C. #
- D. <!-- -->

Sources

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