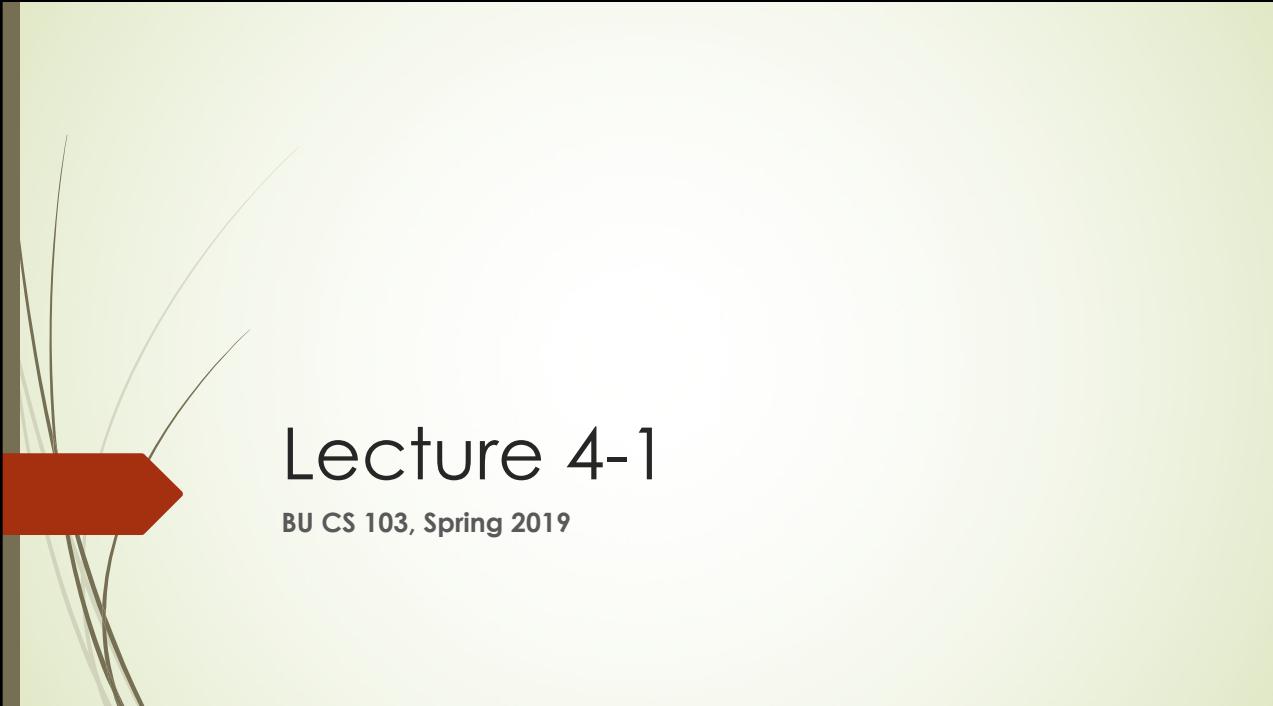


Introduction to Internet Technology and Web Programming

Computer Science 103
Boston University
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These notes are based on the lecture notes provided by [Professor Susan Worst](#).



Lecture 4-1

BU CS 103, Spring 2019

Today's Topics!

- ❖ A Demonstration for Lab 2
- ❖ More HTML coding tips
- ❖ Images & web (part 2)
 - ✓ Image formats
 - ✓ Images; performance, accessibility and findability

Assignments

- ❖ Grades for Lab 1 Assignment & Lab 2 Challenge were posted on the weekend.
- ❖ Deadlines
 - ✓ **Homework 1:** due was today at 6 pm
 - ✓ **Lab 2 Assignment:** due Wednesday at 6pm
- ❖ Let me know by email (vranjbar@bu.edu) if you have any problem with BlackBoard homework submission.

In-Class Activity

Go to the following url in codepen website:

<https://codepen.io/azadeh83/pen/Vgrzjp?editors=1000>

```
<video src="horse.mp3" controls autoplay loop></video>
```

```

```

A Demonstration for Lab 2 Assignment

Audiovisuals & Web

How to add Audiovisual to a webpage

❖ To add audios to a webpage, `<audio>` tag is used.

1. `<audio>` is a paired tag. It needs a closing tag.
2. It needs at least one attribute “src”
3. `<audio src="horse.mp3"></audio>`

❖ To add videos to a webpage, `<video>` tag is used.

1. `<video>` is a paired tag. It needs a closing tag.
2. It needs at least one attribute “src”
3. `<video src="horse.mp3"></video>`

Web Audio/Video Formats

Browser	MP4	WebM	Ogg
Internet Explorer	YES	NO	NO
Chrome	YES	YES	YES
Firefox	YES from Firefox 21 from Firefox 30 for Linux	YES	YES
Safari	YES	NO	NO
Opera	YES From Opera 25	YES	YES

Video

Audio

Browser	MP3	WAV	OGG
Internet Explorer	YES	NO	NO
Chrome	YES	YES	YES
Firefox	YES	YES	YES
Safari	YES	YES	NO
Opera	YES	YES	YES

Attributes for Audio & Video tags

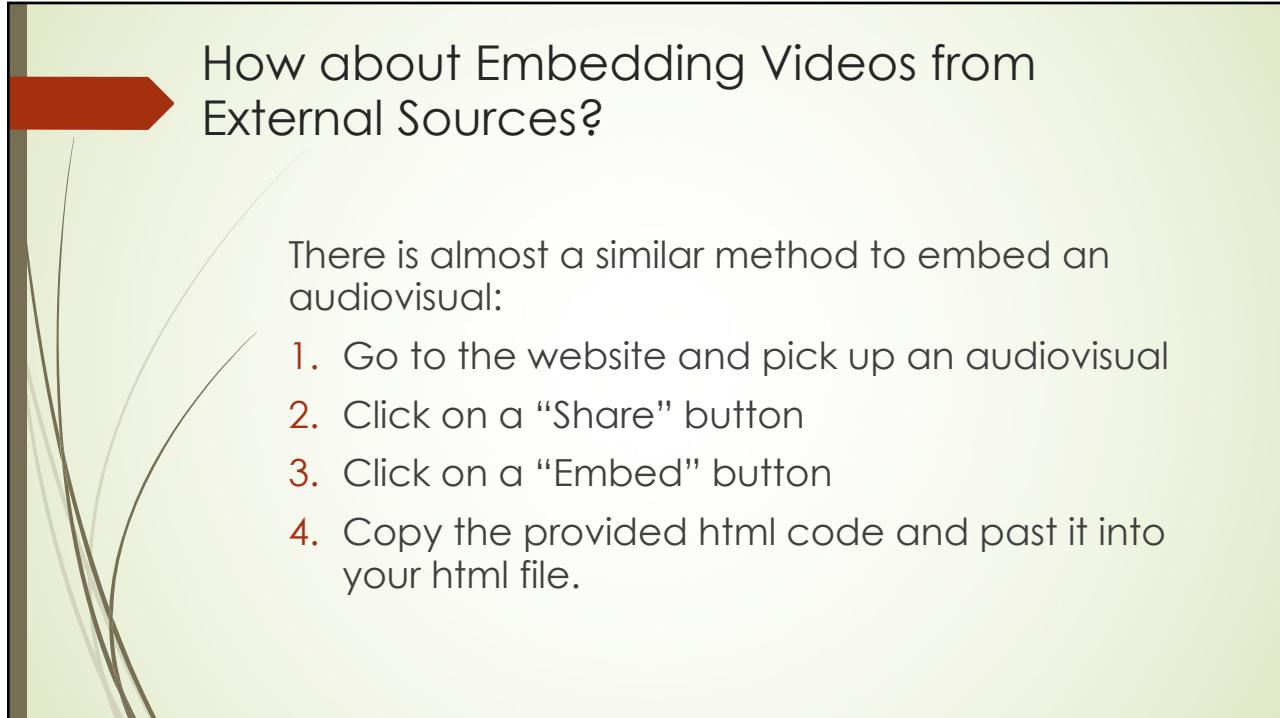
Attribute	Value	Description
autoplay	autoplay	Specifies that the video will start playing as soon as it is ready
controls	controls	Specifies that video controls should be displayed (such as a play/pause button etc).
height	<i>pixels</i>	Sets the height of the video player
loop	loop	Specifies that the video will start over again, every time it is finished
muted	muted	Specifies that the audio output of the video should be muted
poster	<i>URL</i>	Specifies an image to be shown while the video is downloading, or until the user hits the play button
preload	auto metadata none	Specifies if and how the author thinks the video should be loaded when the page loads
src	<i>URL</i>	Specifies the URL of the video file
width	<i>pixels</i>	Sets the width of the video player

```
<video src="horse.mp3" controls autoplay loop></video>
```

How about Embedding Videos from External Sources?

External Sources:

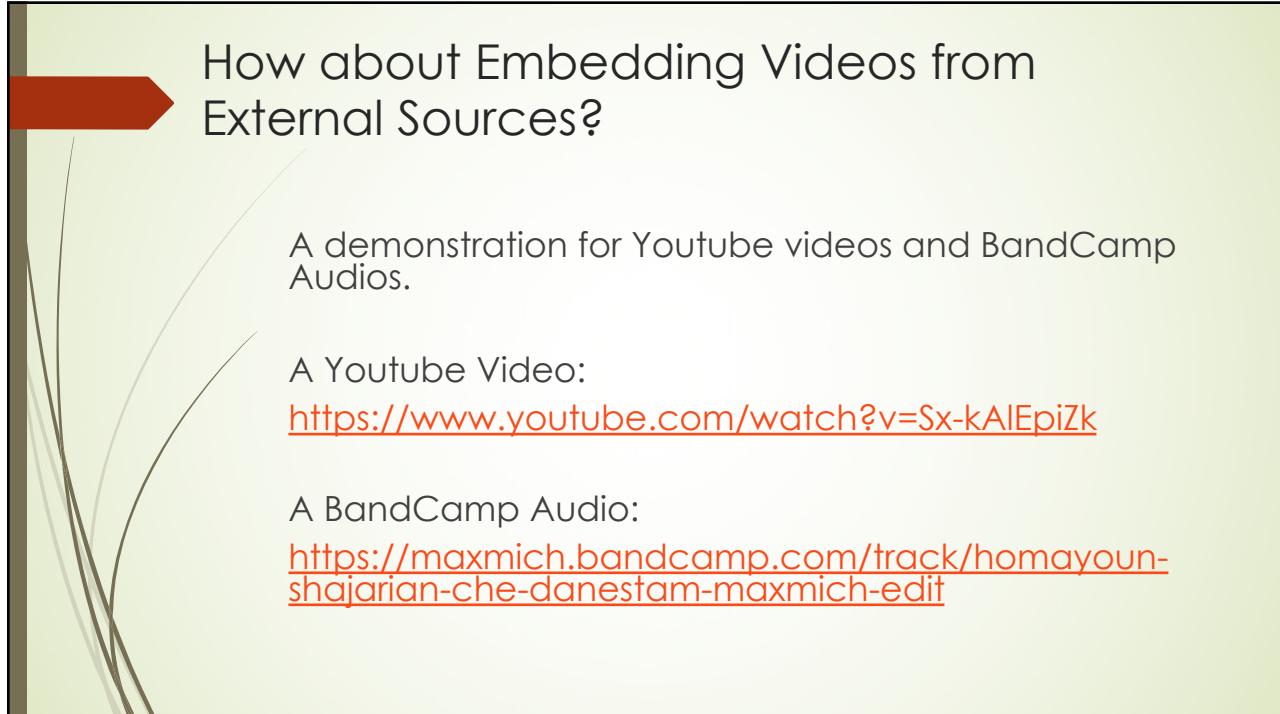
- YouTube
- Vimeo
- Spotify
- SoundCloud
- BandCamp



How about Embedding Videos from External Sources?

There is almost a similar method to embed an audiovisual:

1. Go to the website and pick up an audiovisual
2. Click on a “Share” button
3. Click on a “Embed” button
4. Copy the provided html code and past it into your html file.



How about Embedding Videos from External Sources?

A demonstration for Youtube videos and BandCamp Audios.

A Youtube Video:

<https://www.youtube.com/watch?v=Sx-kAlEpiZk>

A BandCamp Audio:

<https://maxmich.bandcamp.com/track/homayoun-shajarian-che-danestam-maxmich-edit>



More HTML coding tips



Comment tags <!-- -->

- ❖ Comments are useful for web developer
- ❖ ... but they can be helpful for hackers as well
- ❖ Don't use comments for anything private such as usernames or passwords

Nesting techniques in HTML coding

1. the last tag opened should be the first one closed
 - ✓ Example:

Right Boston University

Wrong Boston University
2. Some elements cannot contain others
3. tags must be inside a list tag and and is the only element that can nested **directly** in an ordered or unordered list (or).
 - Any tag other than must be either outside the list, or inside the list item.

Some elements cannot contain others

Paragraphs, Headings, Tables & Lists

- ❖ These elements cannot be nested inside one another.
- ❖ But they can all be part of a list item or a table cell.

Bad HTML coding!

```
<h1>
<p>About Me</p>
</h1>
```

Another bad coding!

```
<p>
<h1>About Me</h1>
</p>
```

A good one!

```
<h1>About Me</h1>
```

Some elements cannot contain others Paragraphs, Headings, Tables & Lists

Bad HTML coding!

```
<p> The chapters are:  
<ol>  
    <li>Chapter 1</li>  
    <li>Chapter 2</li>  
</ol>  
</p>
```

A good one!

```
<p>This is my grocery list:</p>  
<ol>  
    <li>Chapter 1</li>  
    <li>Chapter 2</li>  
</ol>
```

Another bad coding!

```
<ol>  
<p>This is my grocery  
list:</p>  
    <li>Chapter 1</li>  
    <li>Chapter 2</li>
```

Which one is a good HTML coding?

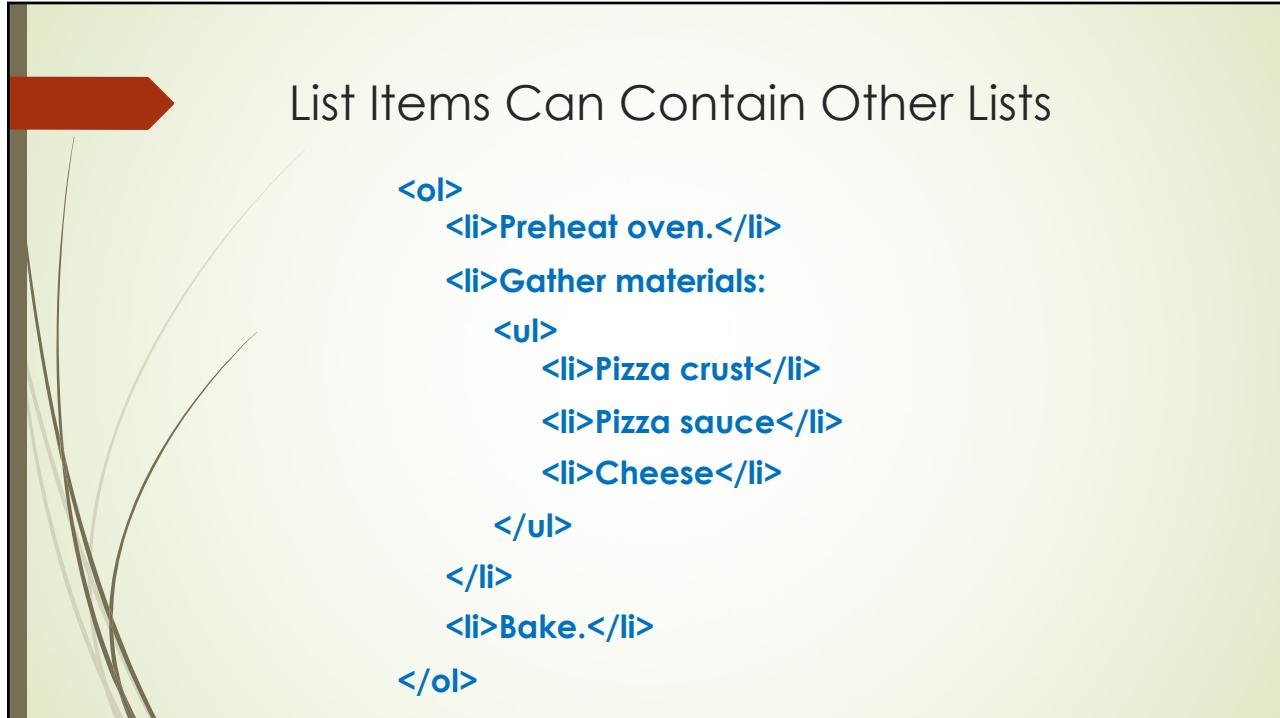
A

```
<ol>  
    <li> ... </li>  
    <li>...  
        <ul>  
            <li> ... </li>  
            <li> ... </li>  
            <li> ... </li>  
        </ul>  
    </li>  
    <li> ... </li>  
</ol>
```

B

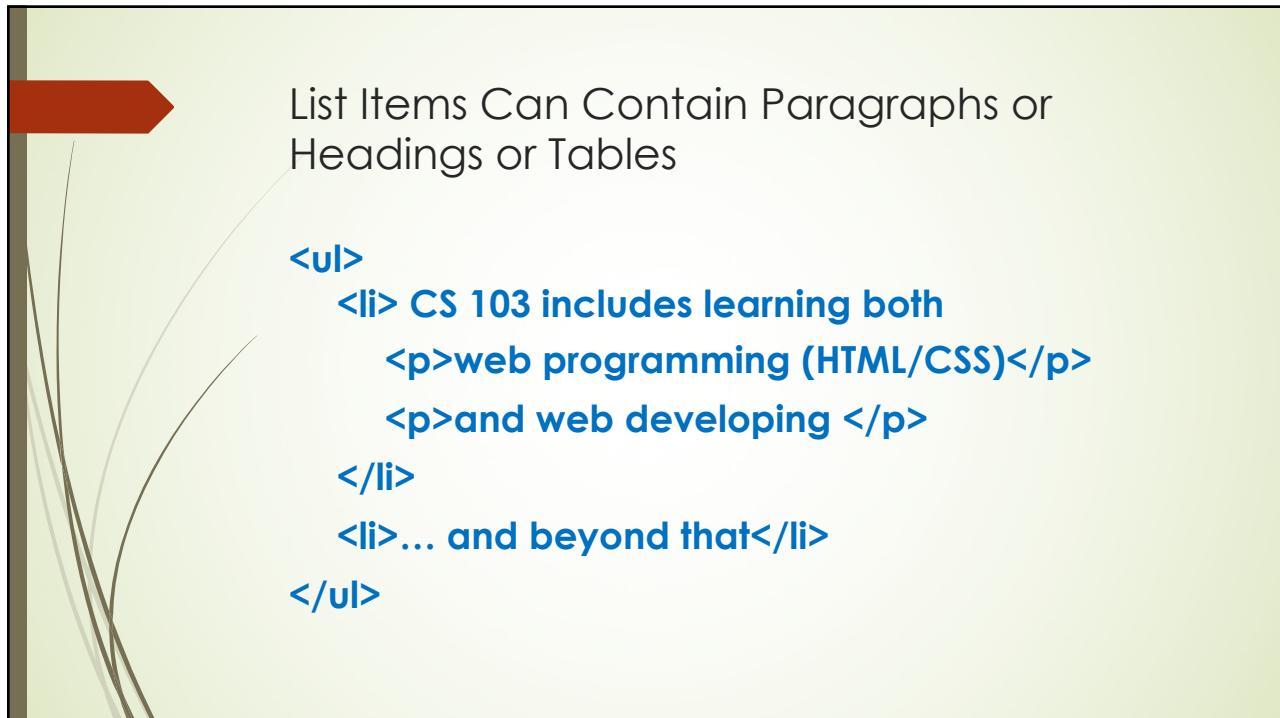
```
<ul>  
    <li> ...  
        <p> ... </p>  
        <p>... </p>  
    </li>  
    <li>... </li>  
</ul>
```

- A. A
B. B
 C. Both of them
D. None of them



List Items Can Contain Other Lists

```
<ol>
  <li>Preheat oven.</li>
  <li>Gather materials:
    <ul>
      <li>Pizza crust</li>
      <li>Pizza sauce</li>
      <li>Cheese</li>
    </ul>
  </li>
  <li>Bake.</li>
</ol>
```



List Items Can Contain Paragraphs or Headings or Tables

```
<ul>
  <li> CS 103 includes learning both
    <p>web programming (HTML/CSS)</p>
    <p>and web developing </p>
  </li>
  <li>... and beyond that</li>
</ul>
```

index.html for web usability and security

- ❖ Increase the **usability** and **security** of your web hosting.

✓ No need to enter the filename as part of the URL (**usability**).

Example:

<http://cs-people.bu.edu/vranjbar/cs103>

is the same as

<http://cs-people.bu.edu/vranjbar/cs103/index.html>

✓ the web server might display the contents of the directory if there is no index.html in the directory (**security**).

<http://cs-people.bu.edu/vranjbar/cs132>

Images: acceptable formats for web developing

- ❖ Web browsers will only display images that are saved in these formats:

- ✓ JPEG (pronounced JAY-peg)
- ✓ PNG (pronounced PING)
- ✓ GIF (pronounced Jiff)
- ✓ SVG (pronounced "S" "V" "G")

- ❖ What image formats have you used that cannot be displayed by web browsers?

- ✓ Tiff

Web Image Formats: JPEG

❖ JPEG

- ✓ Stands for “Joint Photographic Experts Group”
- ✓ 16 million colors
- ✓ Compression is lossy
- ✓ **Best for photos**

Web Image Formats: PNG

❖ PNG

- ✓ Stands for “Portable Network Graphics”
- ✓ 16 million colors
- ✓ Compression is lossless
- ✓ **Good for drawings, logos, and charts regardless of the number of colors**
- ✓ Supports **transparency**
- ✓ Does not support **animation**

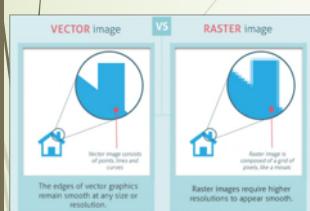
Web Image Formats: GIF

❖ GIF

- ✓ Stands for “Graphics Interchange Format”
- ✓ 256 colors
- ✓ Compression is lossless if 256 colors or less are used
- ✓ Good for **drawings, logos, and charts with less than 256 colors**
- ✓ Supports **transparency**
- ✓ Supports **animation**

Raster Images vs. Vector Images

Raster images represent images as a collection of tiny pixels or little squares of colors



Vector images uses mathematical equations to generate lines and shapes.

<https://visual.ly/community/infographic/computers/beginners-guide-image-formats-web>

Web Image Formats: SVG

❖ SVG

- ✓ Stands for "Scalable Vector Graphics"
- ✓ **Used for drawings and animations, not realistic images**
- ✓ Compression is Lossless
- ✓ Scalable – can use at many different sizes and resolutions without sacrificing quality
- ✓ Images are stored as "objects" (e.g. circle, line, path) rather than as pixels
- ✓ Small file size
- ✓ See [W3Schools.com tutorial](https://www.w3schools.com/tutorials/svg_intro.asp) for more information
 - https://www.w3schools.com/tutorials/svg_intro.asp

Images; performance, accessibility & findability

Improving Performance

- ❖ Image files cause slowly loading web pages
- ❖ Resize image as small as possible
- ❖ Do not resize by adjusting the height and width attributes in the HTML.
``
- ❖ Use lighter-weight alternatives to images:
 - ✓ CSS effects like borders and gradients
 - ✓ Regular text instead of images of text
 - ✓ Icon fonts for icons

Accessibility of Images

- ❖ Accessibility Definition: **Trying to remove barriers** that **prevent access to websites** by **people with disabilities**.
- ❖ Regarding images, using **Screen Readers** for Blind People is one of the best methods.
- ❖ What is a Screen Reader? A programmed software can read HTML pages.
 - ✓ Windows: JAWS (a commercial product)
 - ✓ Mac: Voice Over (a free built-in screen reader)

HTML Coding for Screen Readers

- ❖ In addition to reading all the text of the page, screen readers identify **links**, **lists**, and **headings**
 - ✓ **Lists:** Screen readers include the number of items in a list, helping users to visualize the length of the list
 - ✓ **Heading:** Screen readers include the level of the headings.

How Do Screen Readers Read an Image?

- ❖ **Alternative Text:** Screen reader software cannot read images, it only reads the text of the alt attribute

```
>
```

Some Hints for Alternative Text

- ❖ Every img tag must have an alt attribute
- ❖ For images that are purely **decorative**, use the null alt attribute: alt=""
- ❖ If the images contain **words**, alt attribute should include those words
- ❖ If the image is a **link**, alt attribute should indicate the destination of the link
- ❖ If an image is already described in a caption (text below the image), use a null alt to avoid redundancy
- ❖ Do not use "**image of ...**", "**graphic of ...**" in alt attribute. The screen reader will announce the presence of an image, so "image of" and "graphic of" are redundant.

How Do Screen Readers Read a Page?

Let's experience it!

Findability of Images Due to Alt Attribute

- ❖ Search engines cannot see images. They are only able to use the alt text to determine what an image is about.

Images can be Links

- ❖ To use an image as a link, do the following two steps:
 1. Make the image by using the `` tag between the opening and closing `<a>` tags.

```

```

2. Put the `` tag between the opening and closing `<a>` tags.

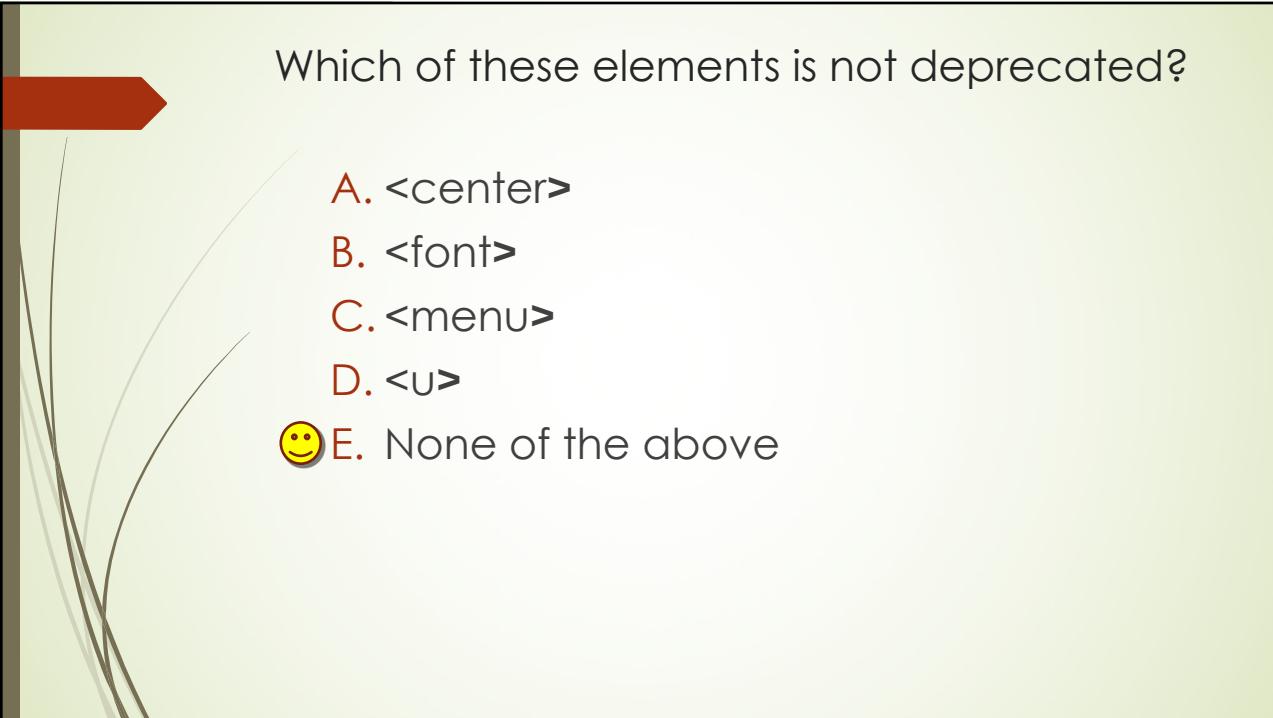
```
<a href="http://www.bu.edu/">  
    
</a>
```

- ❖ Do not use words like "**link to**" or "**click this image**" for alternative text of images that are used as links. The screen reader will say that it is a link.

Review from Last Lecture

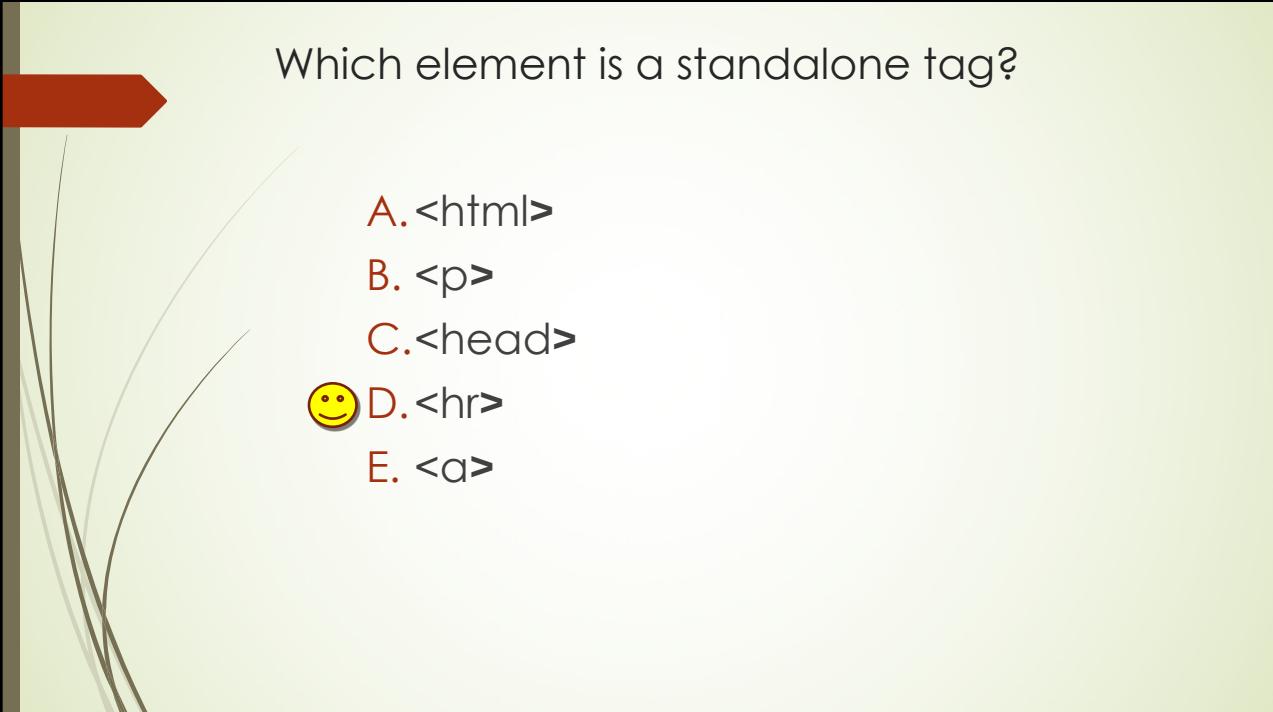
<dir> is a _____ tag. These kind of tags have been used in older version of HTML such as HTML 1.0

- A. Decommissioned
- B. Discontinued
- C. Deprecated
-  D. Deprecated



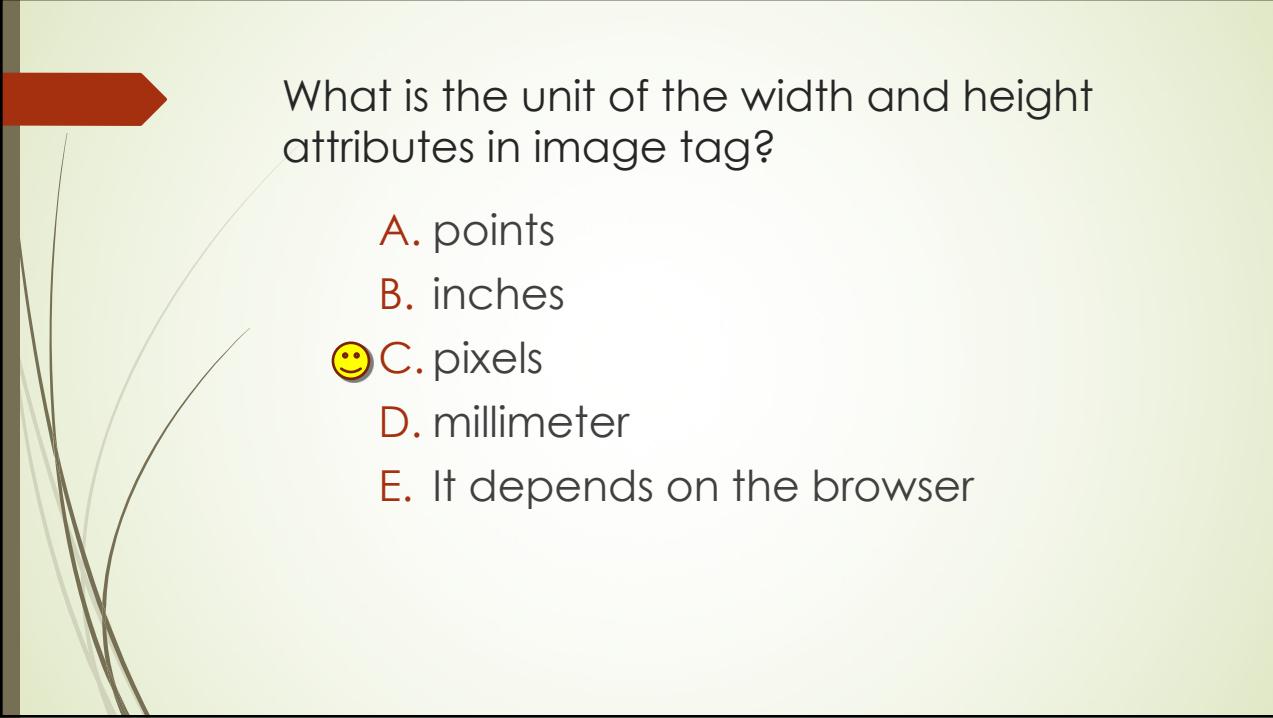
Which of these elements is not deprecated?

- A. <center>
- B.
- C. <menu>
- D. <u>
-  E. None of the above



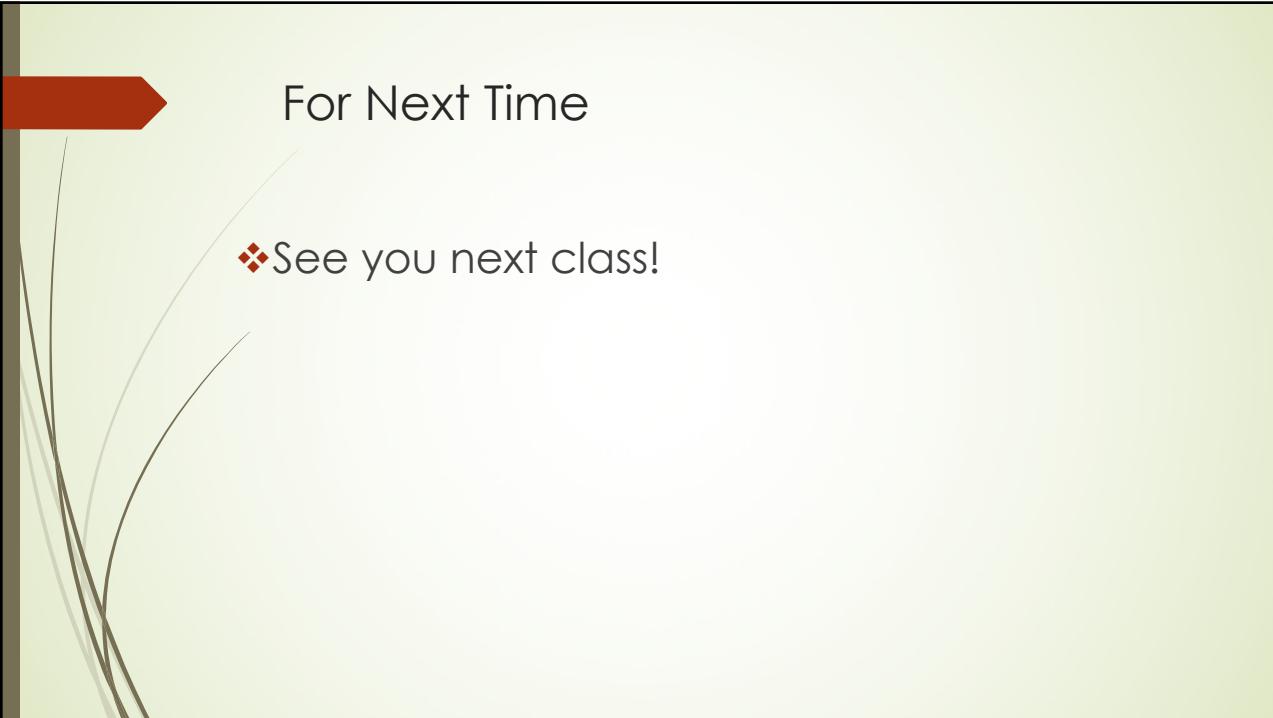
Which element is a standalone tag?

- A. <html>
- B. <p>
- C. <head>
-  D. <hr>
- E. <a>



What is the unit of the width and height attributes in image tag?

- A. points
- B. inches
-  C. pixels
- D. millimeter
- E. It depends on the browser



For Next Time

- ❖ See you next class!