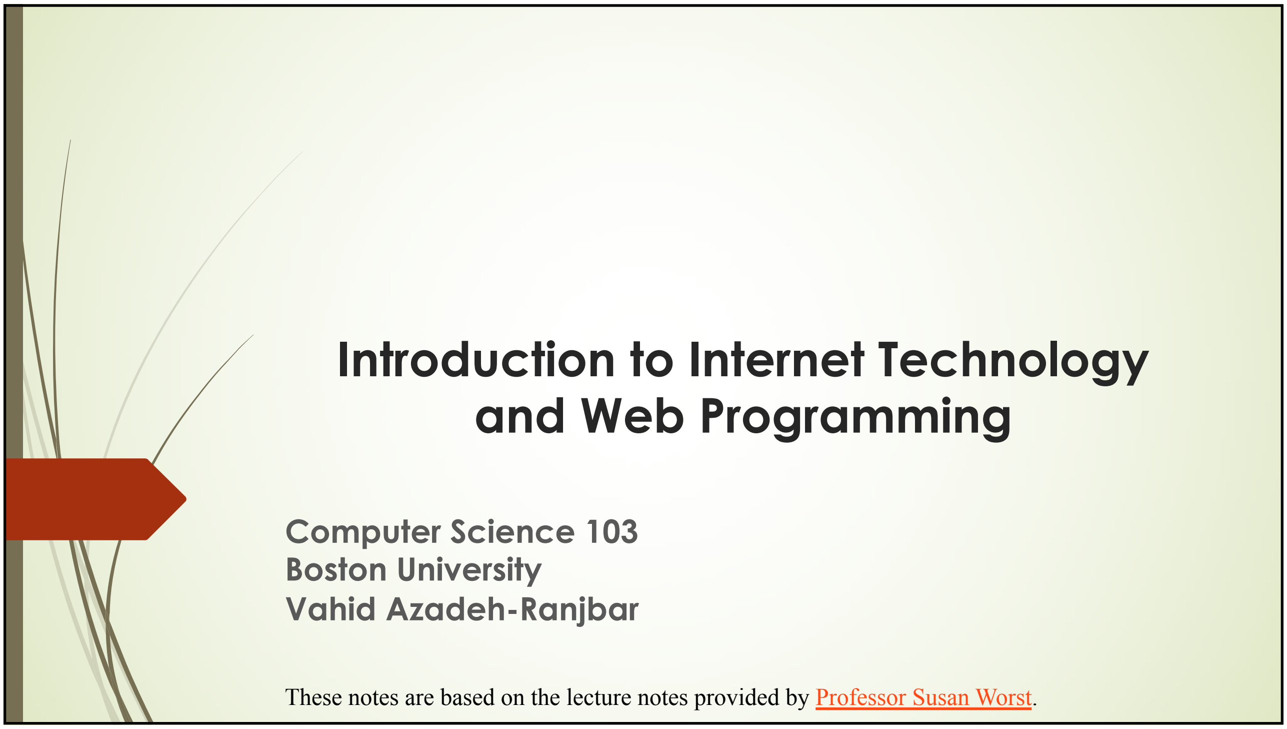
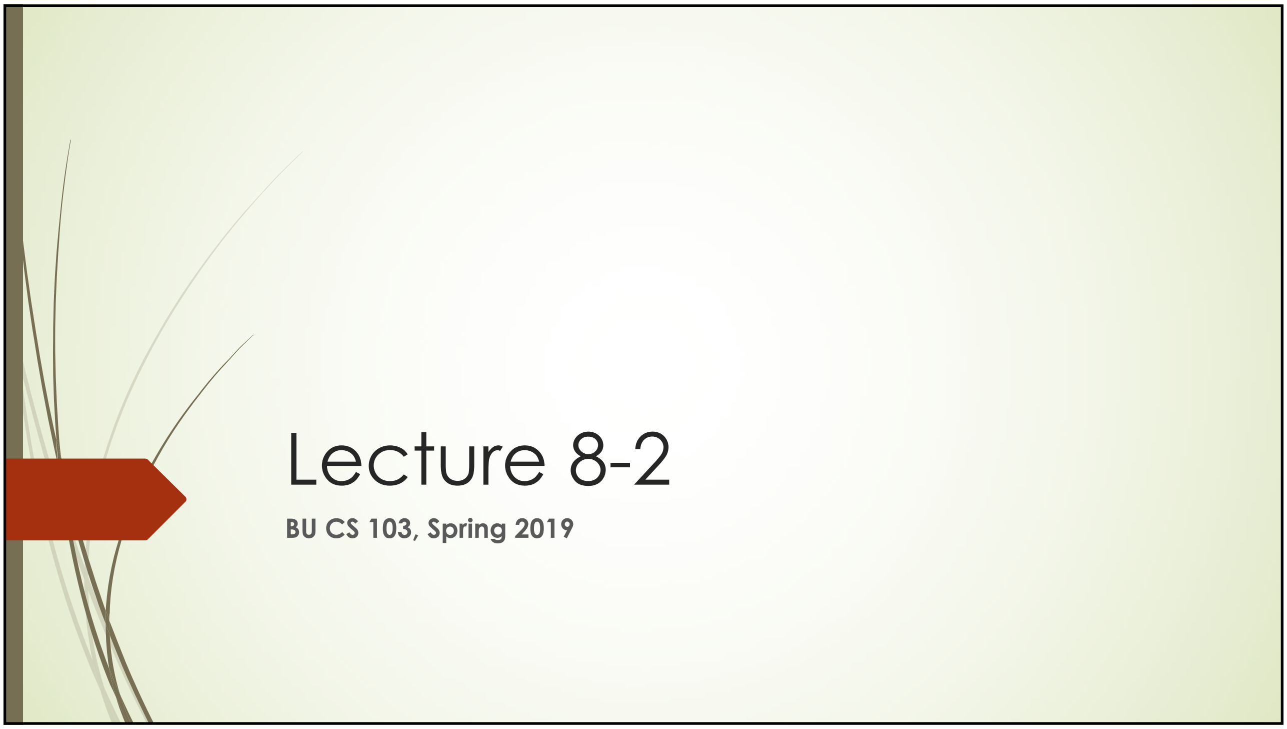


Introduction to Internet Technology and Web Programming

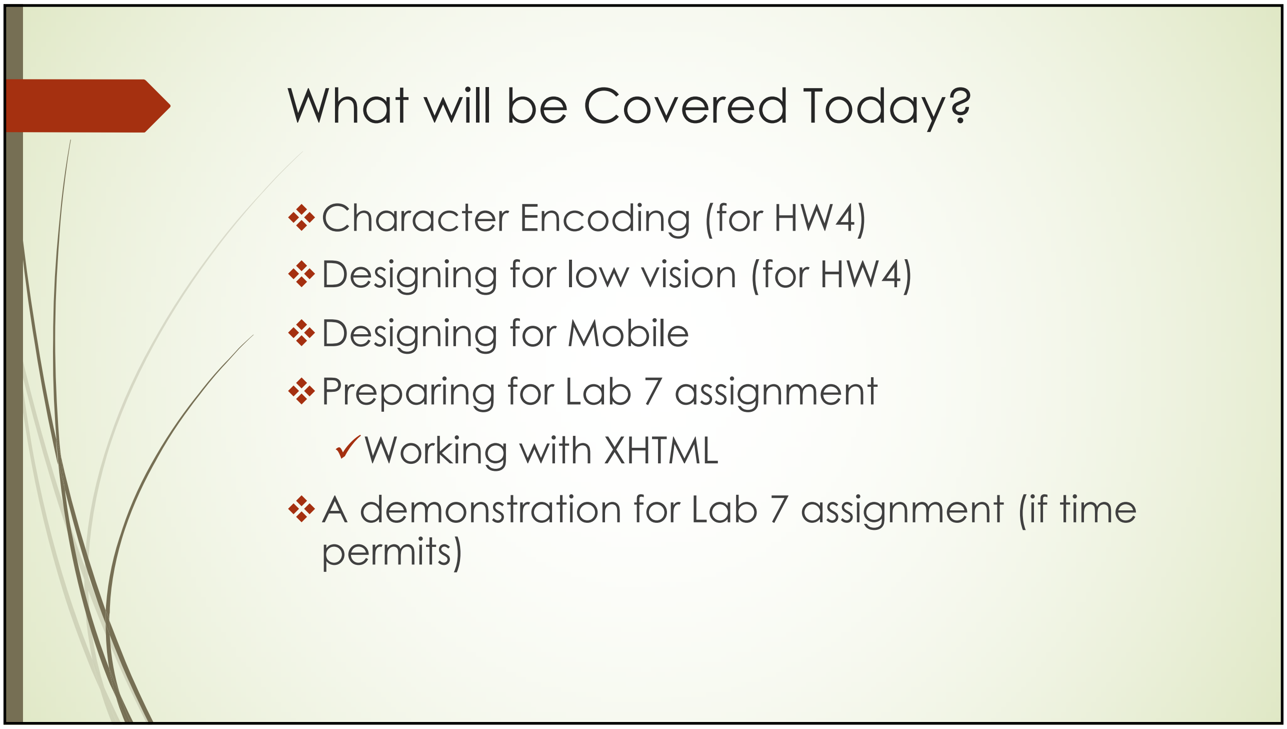
Computer Science 103
Boston University
Vahid Azadeh-Ranjbar

These notes are based on the lecture notes provided by Professor Susan Worst.



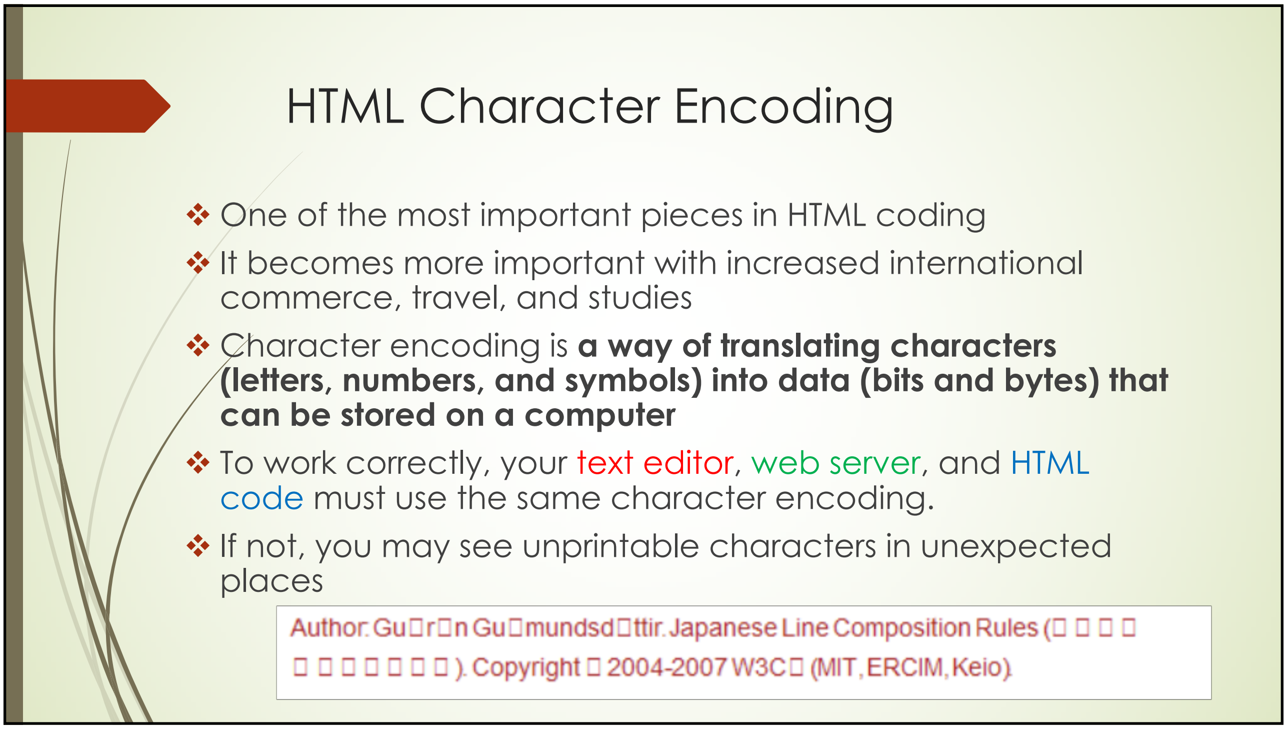
Lecture 8-2

BU CS 103, Spring 2019



What will be Covered Today?

- ❖ Character Encoding (for HW4)
- ❖ Designing for low vision (for HW4)
- ❖ Designing for Mobile
- ❖ Preparing for Lab 7 assignment
  - ✓ Working with XHTML
- ❖ A demonstration for Lab 7 assignment (if time permits)



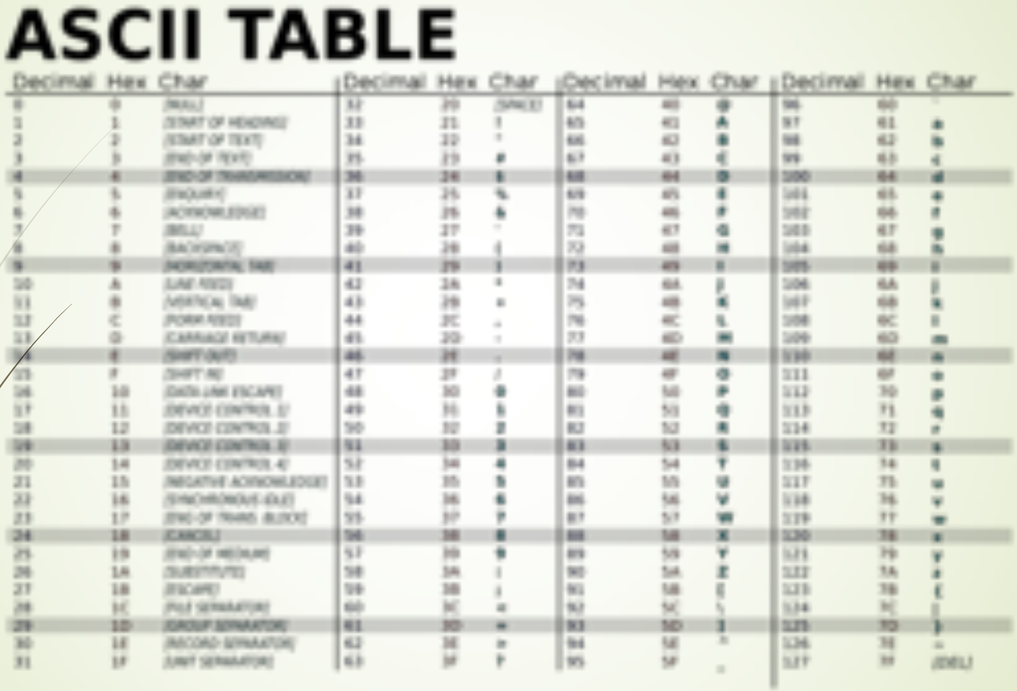
HTML Character Encoding

- ❖ One of the most important pieces in HTML coding
- ❖ It becomes more important with increased international commerce, travel, and studies
- ❖ Character encoding is **a way of translating characters (letters, numbers, and symbols) into data (bits and bytes) that can be stored on a computer**
- ❖ To work correctly, your text editor, web server, and HTML code must use the same character encoding.
- ❖ If not, you may see unprintable characters in unexpected places

Author: Gu□r□n Gu□mundsd□ttir. Japanese Line Composition Rules (□ □ □ □ □ □ □ □ □ □ □). Copyright □ 2004-2007 W3C□ (MIT, ERCIM, Keio)

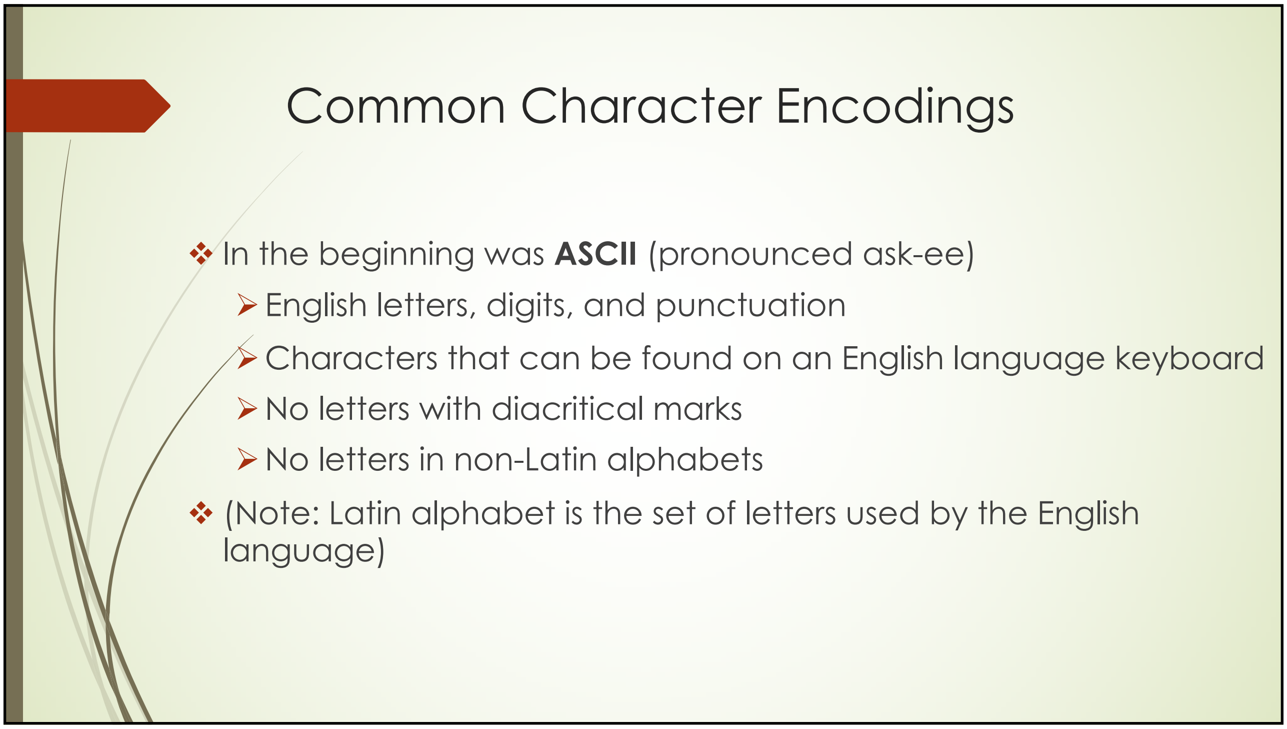
Common Character Encodings

- ❖ In the beginning was **ASCII** (pronounced ask-ee)



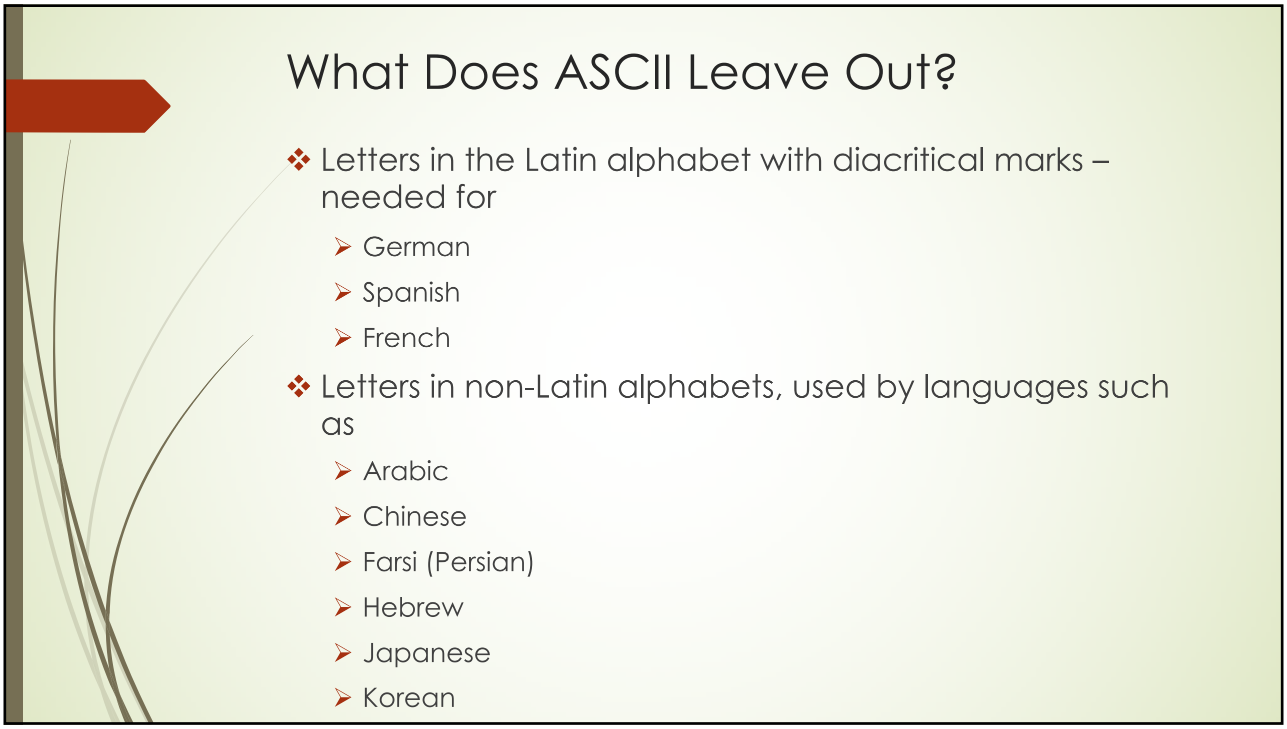
ASCII TABLE

Decimal	Hex	Char	Decimal	Hex	Char	Decimal	Hex	Char	Decimal	Hex	Char
0	0	[NULL]	32	20	[SPACE]	64	40	@	96	60	`
1	1	[START OF HEADING]	33	21	!	65	41	A	97	61	a
2	2	[START OF TEXT]	34	22	"	66	42	B	98	62	b
3	3	[END OF TEXT]	35	23	#	67	43	C	99	63	c
4	4	[END OF TRANSMISSION]	36	24	$	68	44	D	100	64	d
5	5	[ENQUIRY]	37	25	%	69	45	E	101	65	e
6	6	[ACKNOWLEDGE]	38	26	&	70	46	F	102	66	f
7	7	[BELL]	39	27	'	71	47	G	103	67	g
8	8	[BACKSPACE]	40	28	(	72	48	H	104	68	h
9	9	[HORIZONTAL TAB]	41	29	)	73	49	I	105	69	i
10	A	[LINE FEED]	42	2A	*	74	4A	J	106	6A	j
11	B	[VERTICAL TAB]	43	2B	+	75	4B	K	107	6B	k
12	C	[FORM FEED]	44	2C	,	76	4C	L	108	6C	l
13	D	[CARRIAGE RETURN]	45	2D	-	77	4D	M	109	6D	m
14	E	[SHIFT OUT]	46	2E	.	78	4E	N	110	6E	n
15	F	[SHIFT IN]	47	2F	/	79	4F	O	111	6F	o
16	10	[DATA LINK ESCAPE]	48	30	0	80	50	P	112	70	p
17	11	[DEVICE CONTROL 1]	49	31	1	81	51	Q	113	71	q
18	12	[DEVICE CONTROL 2]	50	32	2	82	52	R	114	72	r
19	13	[DEVICE CONTROL 3]	51	33	3	83	53	S	115	73	s
20	14	[DEVICE CONTROL 4]	52	34	4	84	54	T	116	74	t
21	15	[NEGATIVE ACKNOWLEDGE]	53	35	5	85	55	U	117	75	u
22	16	[SYNCHRONOUS IDLE]	54	36	6	86	56	V	118	76	v
23	17	[ENG OF TRANS. BLOCK]	55	37	7	87	57	W	119	77	w
24	18	[CANCEL]	56	38	8	88	58	X	120	78	x
25	19	[END OF MEDIUM]	57	39	9	89	59	Y	121	79	y
26	1A	[SUBSTITUTE]	58	3A	:	90	5A	Z	122	7A	z
27	1B	[ESCAPE]	59	3B	;	91	5B	[	123	7B	{
28	1C	[FILE SEPARATOR]	60	3C	<	92	5C	\	124	7C	|
29	1D	[GROUP SEPARATOR]	61	3D	=	93	5D	]	125	7D	}
30	1E	[RECORD SEPARATOR]	62	3E	>	94	5E	^	126	7E	~
31	1F	[UNIT SEPARATOR]	63	3F	?	95	5F	_	127	7F	[DEL]



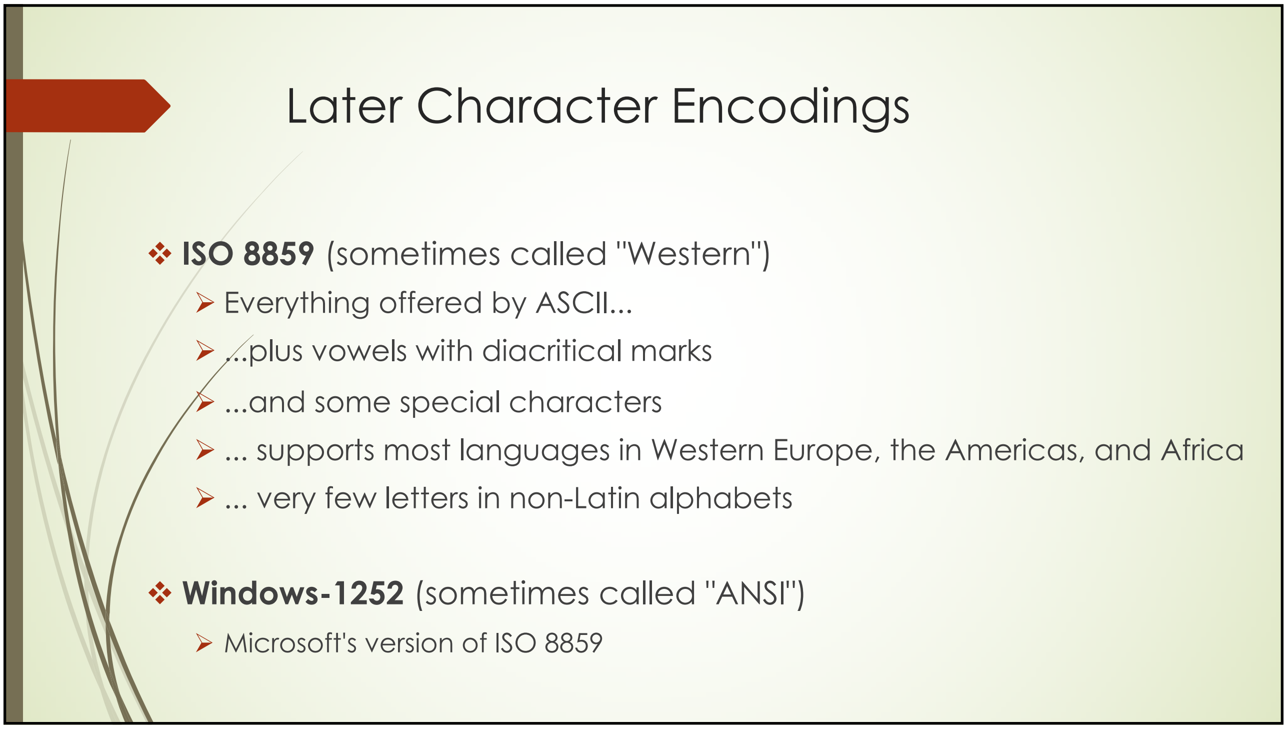
Common Character Encodings

- In the beginning was **ASCII** (pronounced ask-ee)
  - English letters, digits, and punctuation
  - Characters that can be found on an English language keyboard
  - No letters with diacritical marks
  - No letters in non-Latin alphabets
- (Note: Latin alphabet is the set of letters used by the English language)



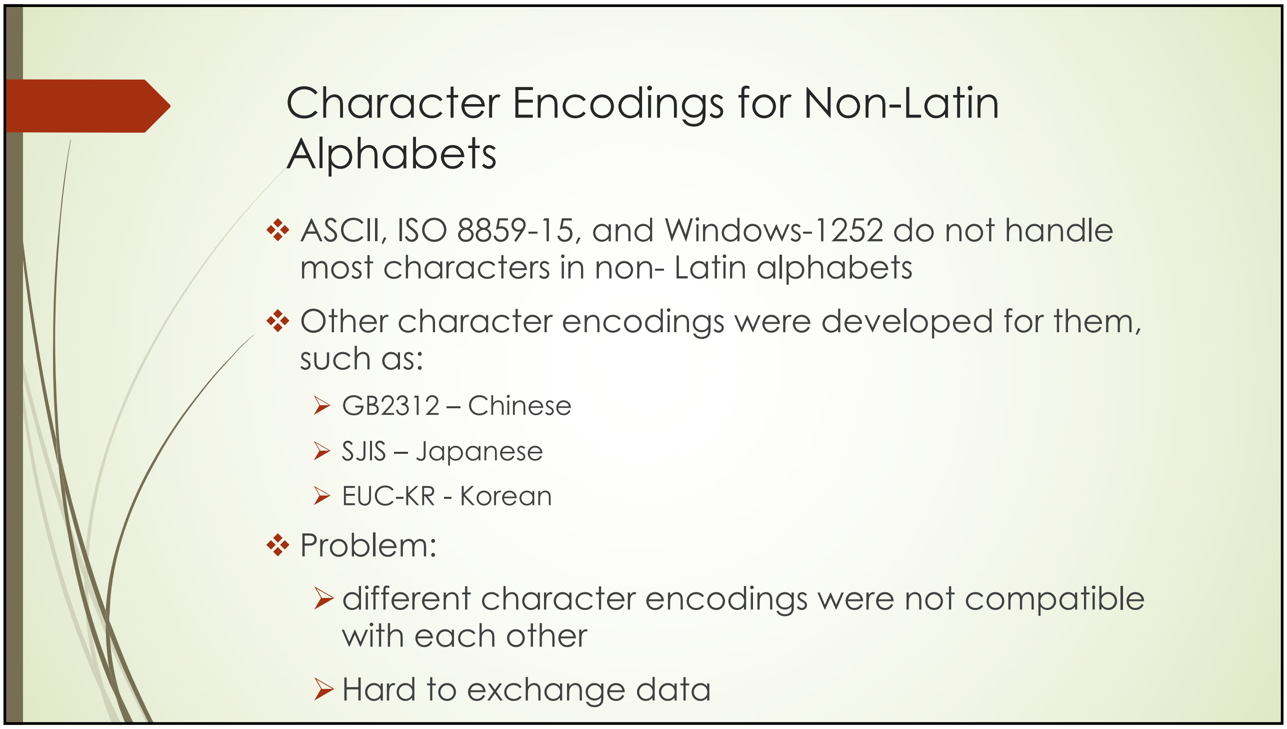
What Does ASCII Leave Out?

- Letters in the Latin alphabet with diacritical marks – needed for
  - German
  - Spanish
  - French
- Letters in non-Latin alphabets, used by languages such as
  - Arabic
  - Chinese
  - Farsi (Persian)
  - Hebrew
  - Japanese
  - Korean



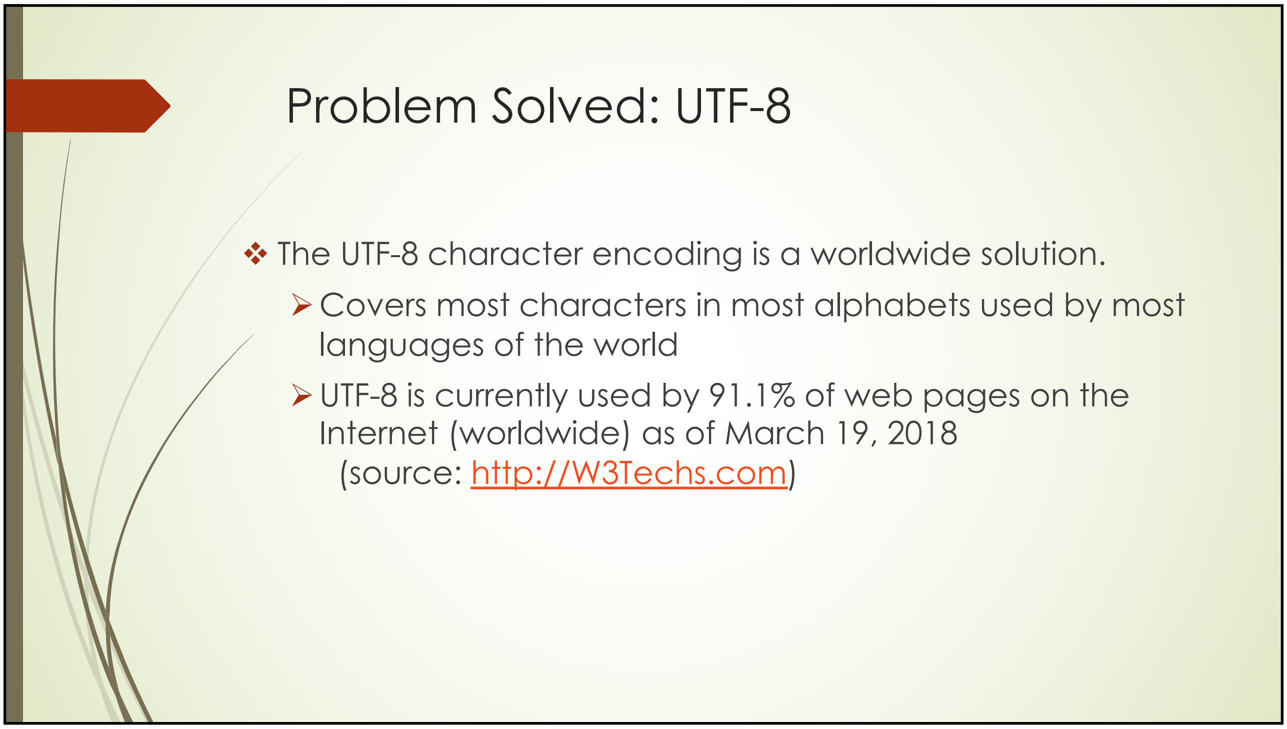
Later Character Encodings

- ❖ **ISO 8859** (sometimes called "Western")
  - ➢ Everything offered by ASCII...
  - ➢ ...plus vowels with diacritical marks
  - ➢ ...and some special characters
  - ➢ ... supports most languages in Western Europe, the Americas, and Africa
  - ➢ ... very few letters in non-Latin alphabets
- ❖ **Windows-1252** (sometimes called "ANSI")
  - ➢ Microsoft's version of ISO 8859



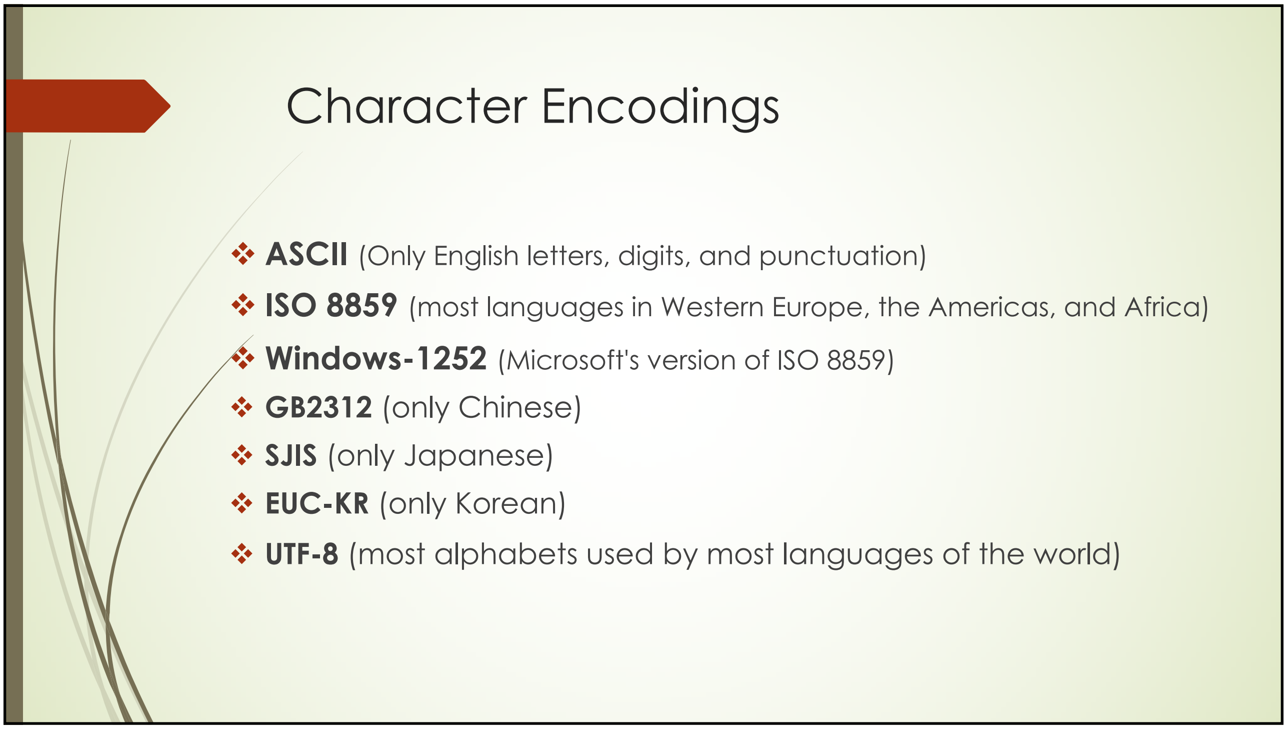
Character Encodings for Non-Latin Alphabets

- ❖ ASCII, ISO 8859-15, and Windows-1252 do not handle most characters in non- Latin alphabets
- ❖ Other character encodings were developed for them, such as:
  - ➢ GB2312 – Chinese
  - ➢ SJIS – Japanese
  - ➢ EUC-KR - Korean
- ❖ Problem:
  - ➢ different character encodings were not compatible with each other
  - ➢ Hard to exchange data



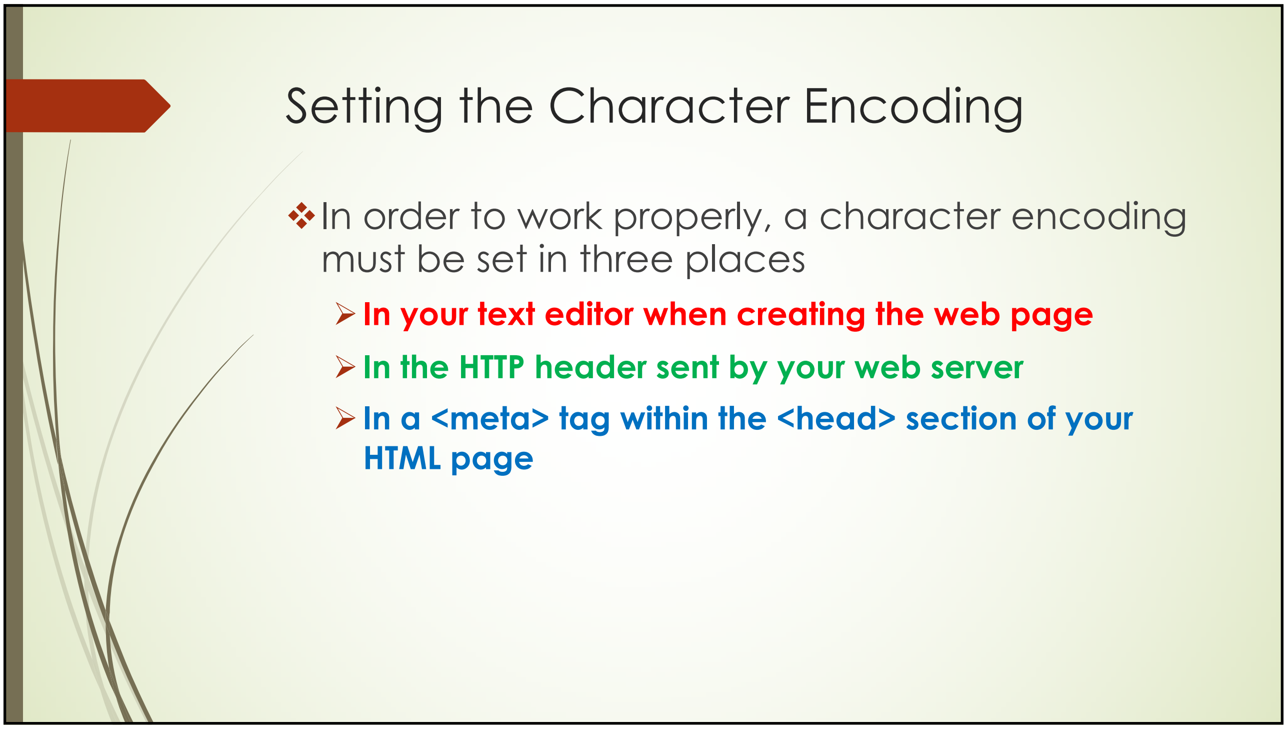
Problem Solved: UTF-8

- The UTF-8 character encoding is a worldwide solution.
  - Covers most characters in most alphabets used by most languages of the world
  - UTF-8 is currently used by 91.1% of web pages on the Internet (worldwide) as of March 19, 2018
    (source: http://W3Techs.com)



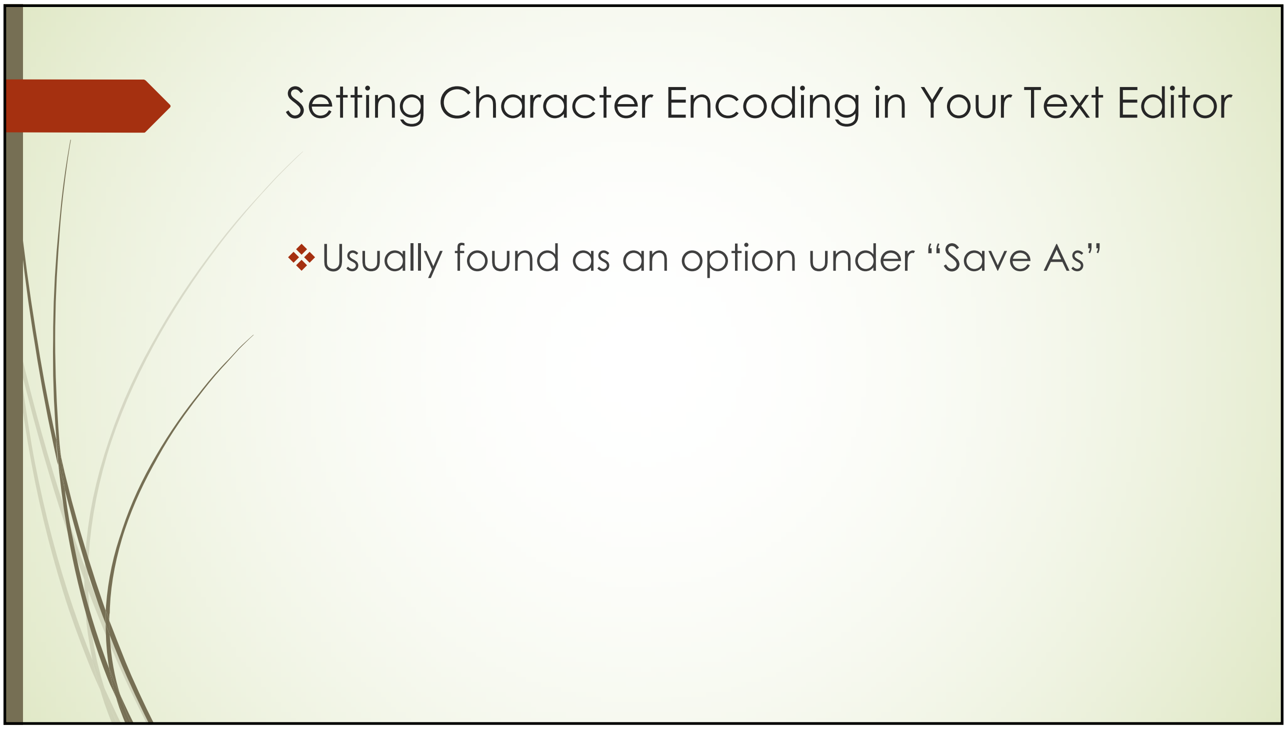
Character Encodings

- **ASCII** (Only English letters, digits, and punctuation)
- **ISO 8859** (most languages in Western Europe, the Americas, and Africa)
- **Windows-1252** (Microsoft's version of ISO 8859)
- **GB2312** (only Chinese)
- **SJIS** (only Japanese)
- **EUC-KR** (only Korean)
- **UTF-8** (most alphabets used by most languages of the world)



Setting the Character Encoding

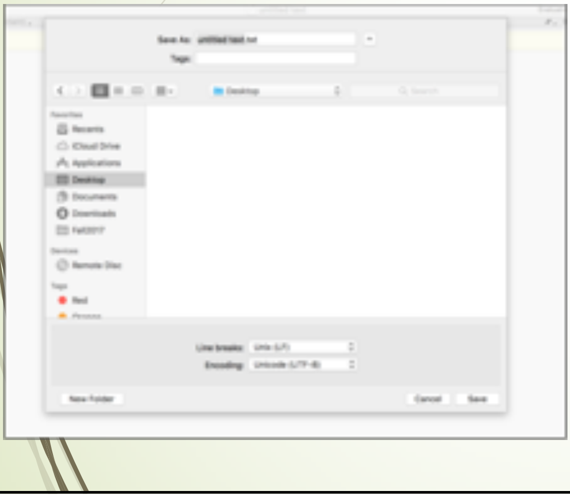
- In order to work properly, a character encoding must be set in three places
  - **In your text editor when creating the web page**
  - **In the HTTP header sent by your web server**
  - **In a <meta> tag within the <head> section of your HTML page**



Setting Character Encoding in Your Text Editor

- Usually found as an option under “Save As”

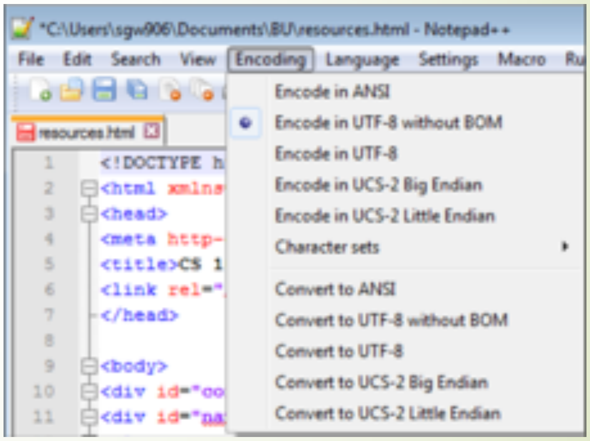
in BBEdit & Notepad++



Save As: untitled text.txt

Line breaks: Unix (LF)

Encoding: Unicode (UTF-8)



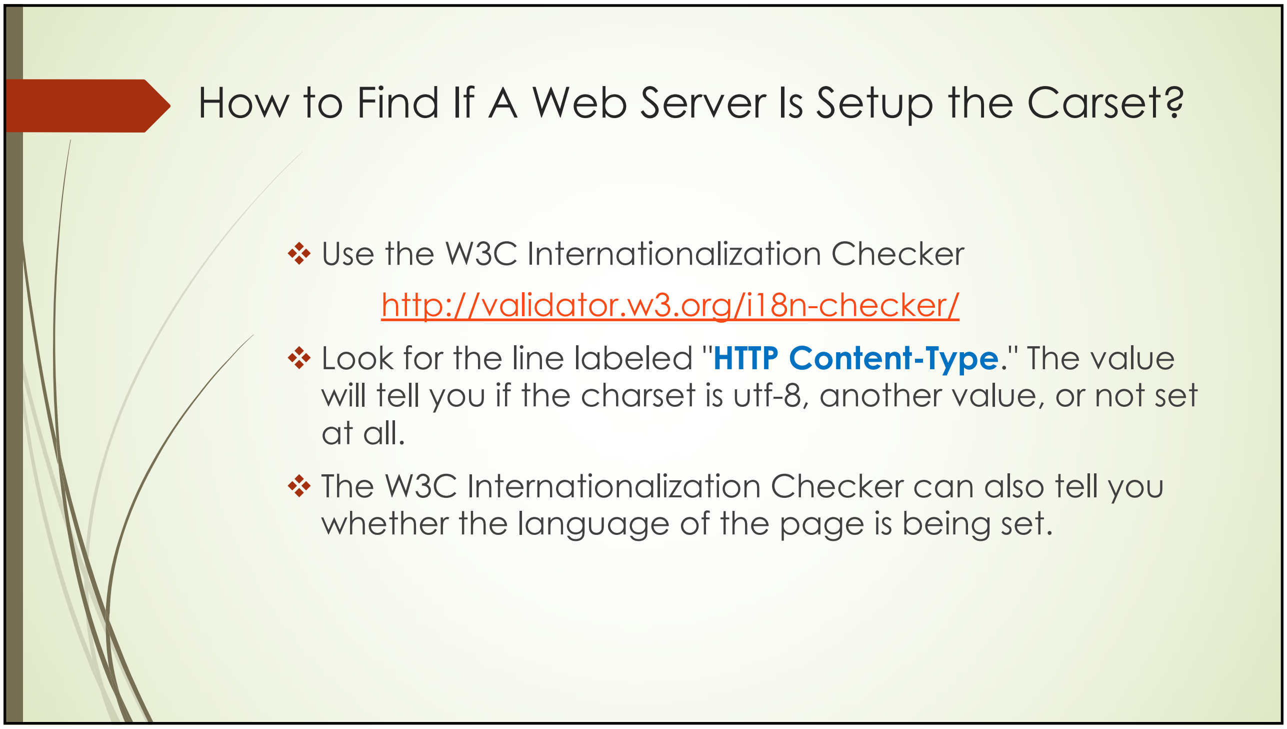
```
<!DOCTYPE h
<html xmlns
<head>
<meta http-
<title>CS 1
<link rel="
</head>

<body>
<div id="co
<div id="na
```

*C:\Users\sgw906\Documents\BU\resources.html - Notepad++
File
Edit
Search
View
Encoding
Language
Settings
Macro
Ru
resources.html
Encode in ANSI
● Encode in UTF-8 without BOM
Encode in UTF-8
Encode in UCS-2 Big Endian
Encode in UCS-2 Little Endian
Character sets
Convert to ANSI
Convert to UTF-8 without BOM
Convert to UTF-8
Convert to UCS-2 Big Endian
Convert to UCS-2 Little Endian

Setting Character Encoding on the Web Server

- When a web server sends data to a web browser, it includes something called the "**HTTP header**" – *instructions to the browser on how to display the data.*
- **HTTP** = HyperText Transfer Protocol – the way that web browsers request and receive information
- The HTTP header includes an optional setting called **charset** which is for character encoding

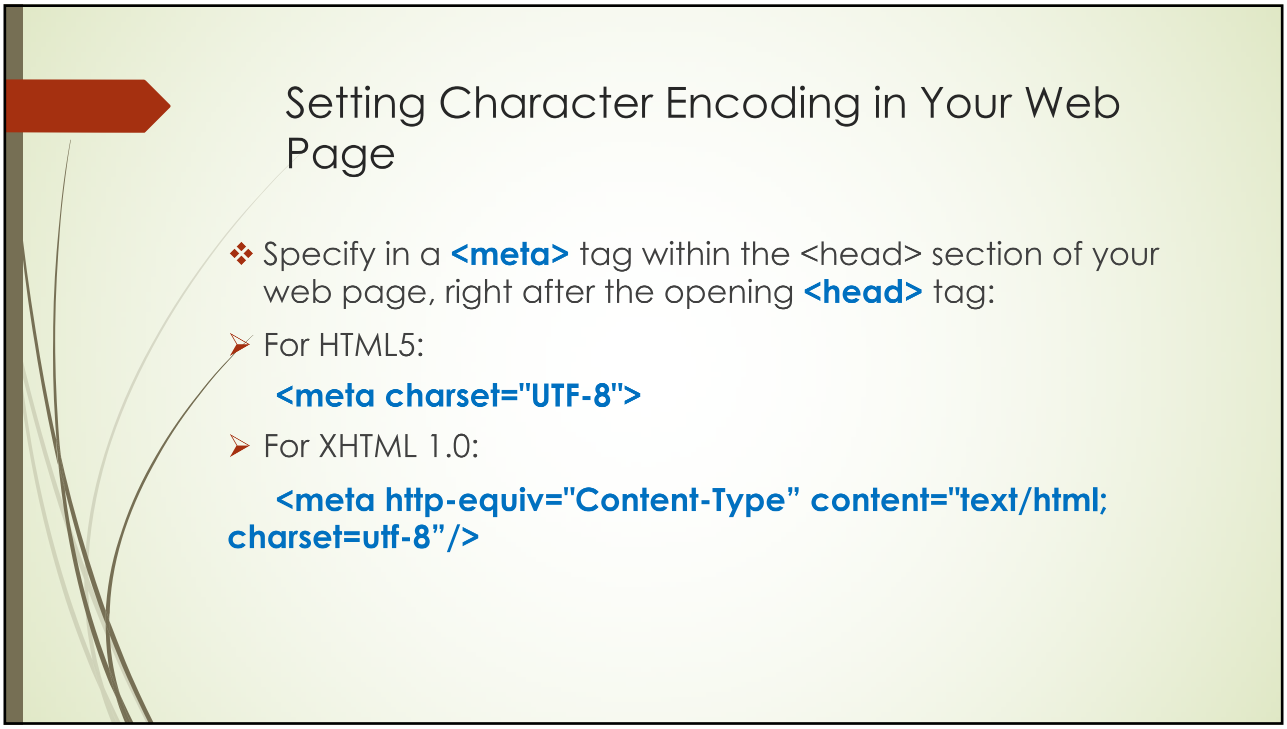


How to Find If A Web Server Is Setup the Carset?

- Use the W3C Internationalization Checker

  http://validator.w3.org/i18n-checker/

- Look for the line labeled "**HTTP Content-Type**." The value will tell you if the charset is utf-8, another value, or not set at all.
- The W3C Internationalization Checker can also tell you whether the language of the page is being set.



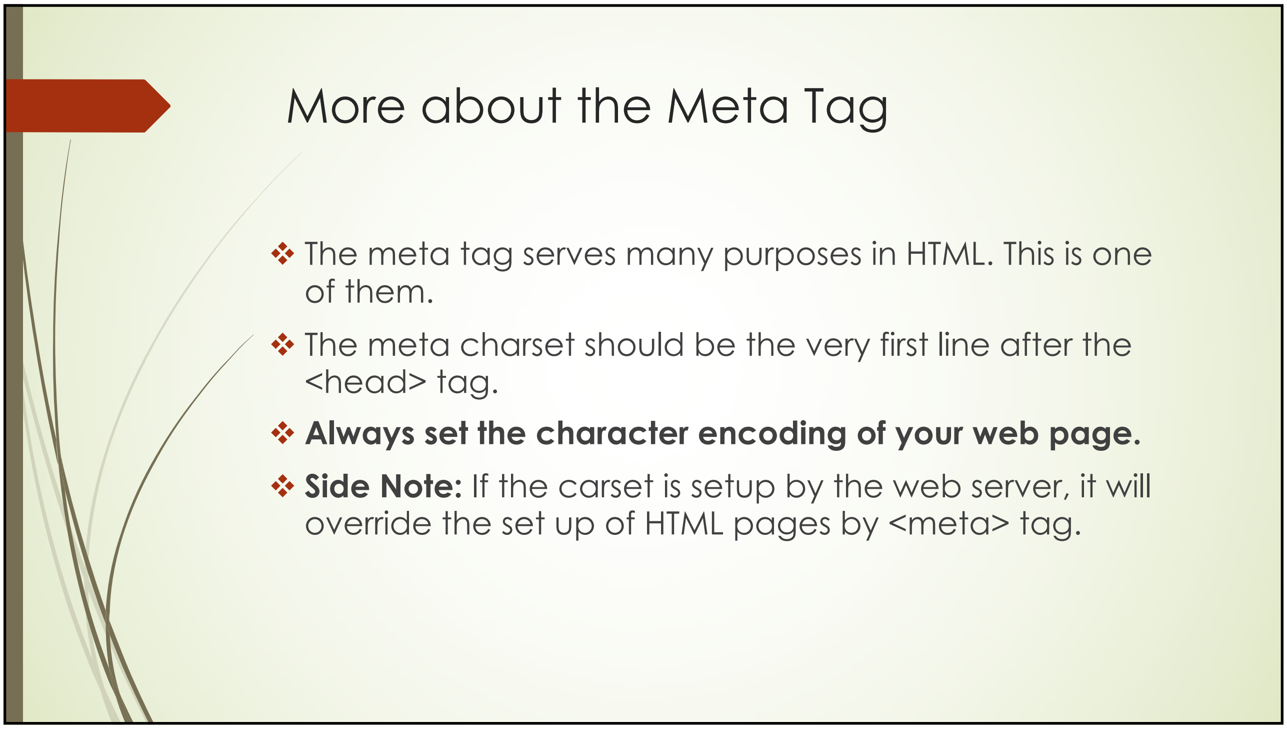
Setting Character Encoding in Your Web Page

- Specify in a **<meta>** tag within the <head> section of your web page, right after the opening **<head>** tag:
- For HTML5:

  <meta charset="UTF-8">

- For XHTML 1.0:

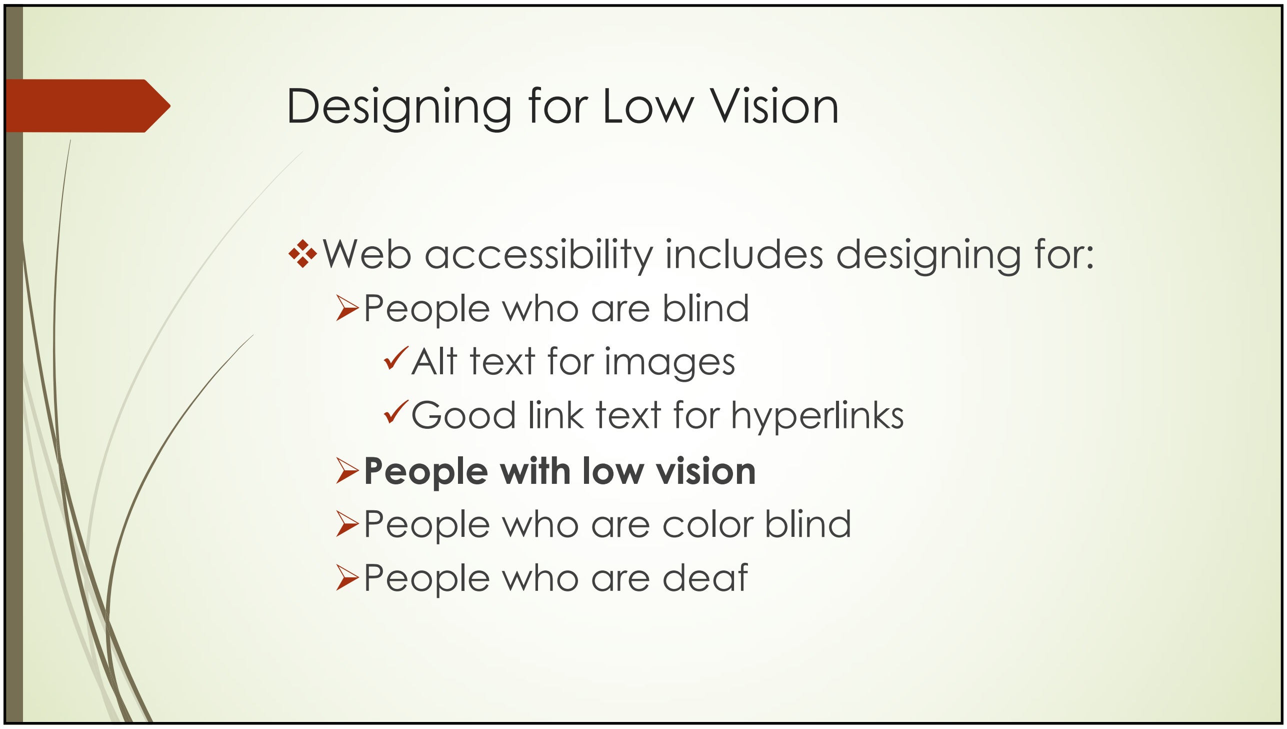
  <meta http-equiv="Content-Type" content="text/html; charset=utf-8"/>



More about the Meta Tag

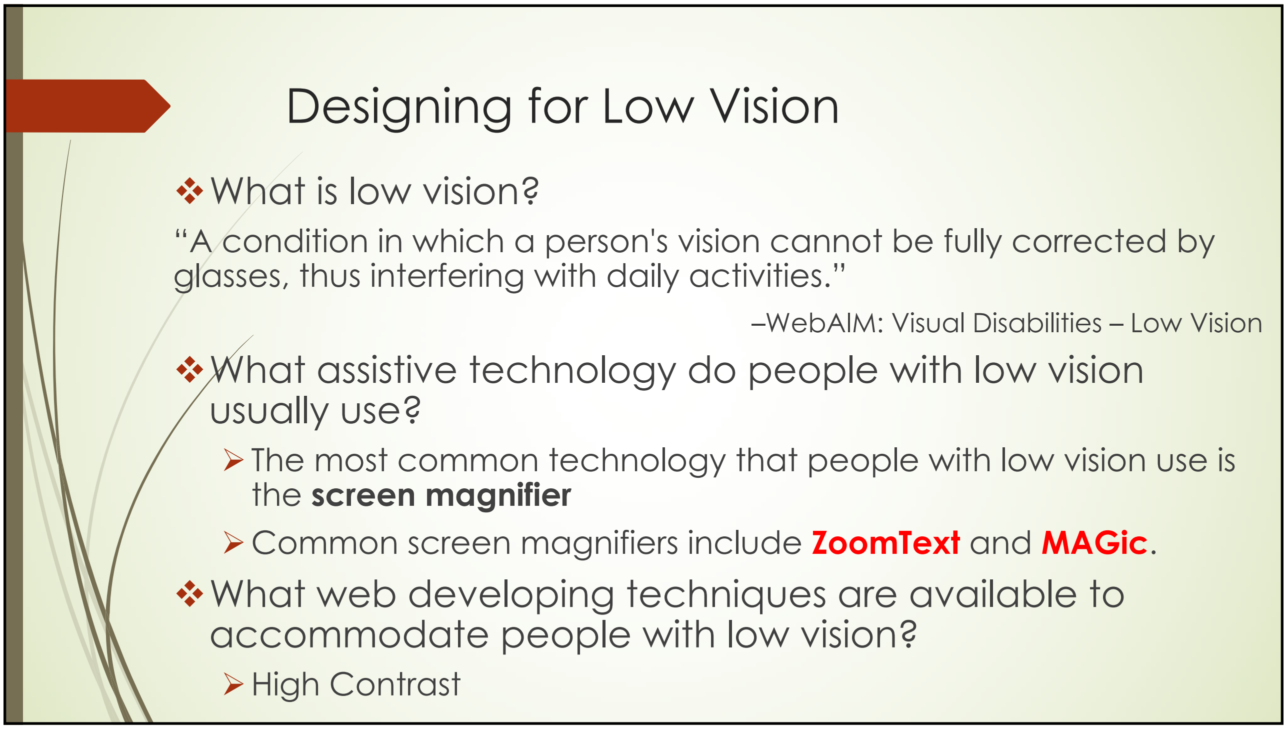
- The meta tag serves many purposes in HTML. This is one of them.
- The meta charset should be the very first line after the <head> tag.
- **Always set the character encoding of your web page.**
- **Side Note:** If the carset is setup by the web server, it will override the set up of HTML pages by <meta> tag.

Designing for Low Vision



Designing for Low Vision

- ❖ Web accessibility includes designing for:
  - ➢ People who are blind
    - ✓ Alt text for images
    - ✓ Good link text for hyperlinks
  - ➢ **People with low vision**
  - ➢ People who are color blind
  - ➢ People who are deaf



Designing for Low Vision

- ❖ What is low vision?

"A condition in which a person's vision cannot be fully corrected by glasses, thus interfering with daily activities."

–WebAIM: Visual Disabilities – Low Vision

- ❖ What assistive technology do people with low vision usually use?
  - ➢ The most common technology that people with low vision use is the **screen magnifier**
  - ➢ Common screen magnifiers include **ZoomText** and **MAGic**.
- ❖ What web developing techniques are available to accommodate people with low vision?
  - ➢ High Contrast

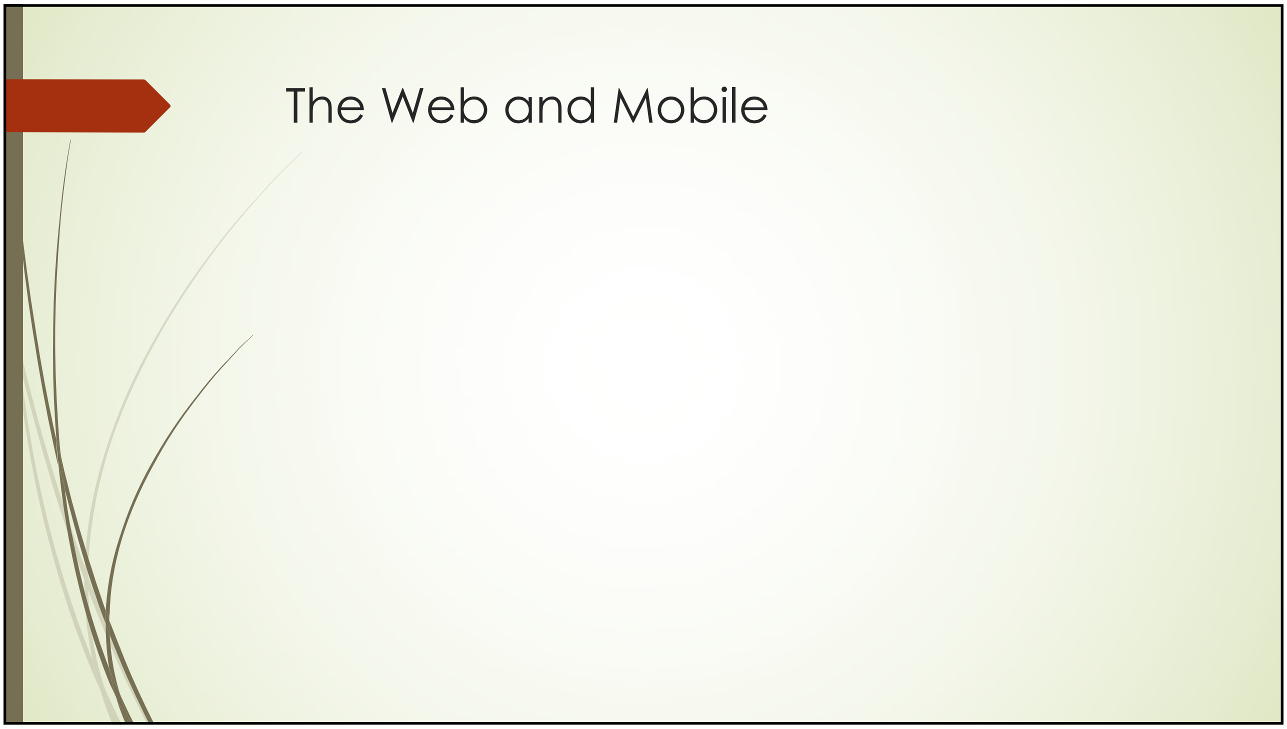
Designing for Low Vision

1. Use true text as opposed to text in graphics
   - ❖Looks better when enlarged
   - ❖Allows users to change color contrast if they wish
2. Maximize color contrast of web pages
   - ❖Includes text against background on pages
   - ❖As well as text against background in graphics
3. Use flexible widths (percentages instead of pixels) in layout
   - ❖Avoids the need for horizontal scrolling

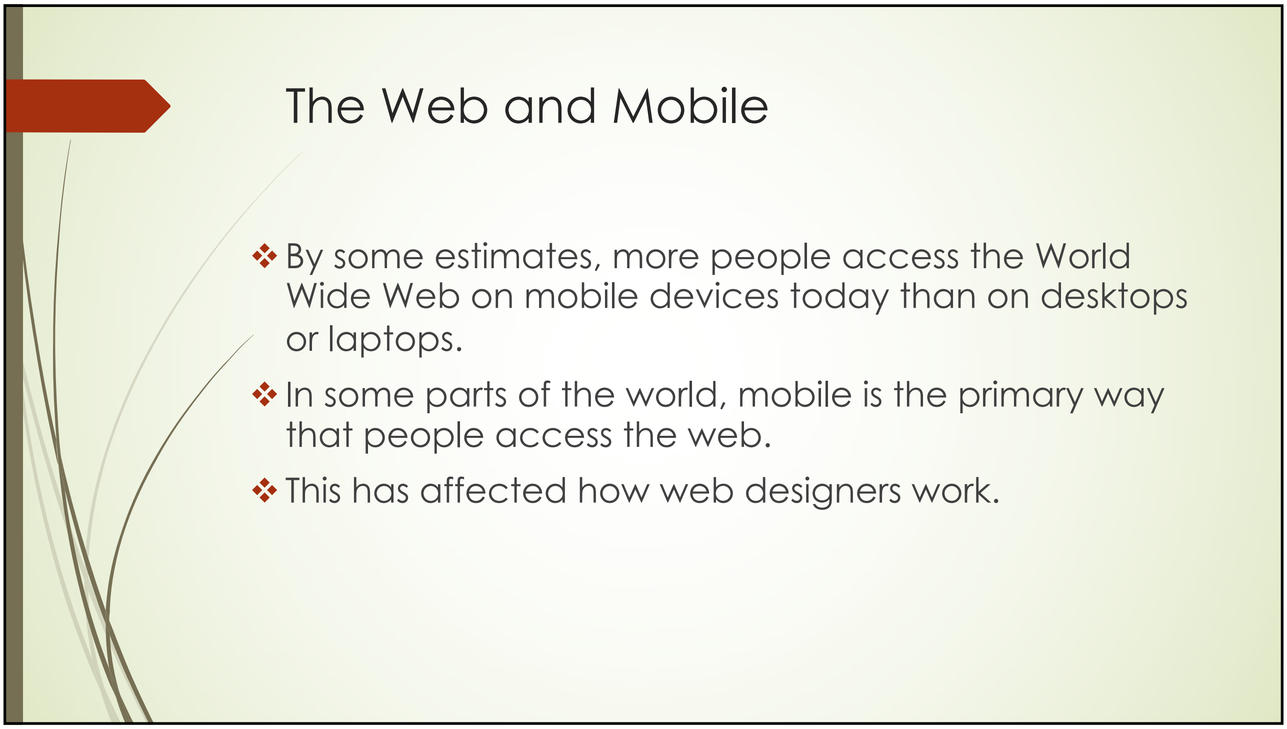
HomeWork 4 & Designing for Low Vision

❖http://wave.webaim.org/

- ➢ Making your web pages easy to read by ensuring visual contrast between foreground and background colors.
- ➢ We will use the WAVE tool from WebAIM to identify web pages with good and not-so-good color contrast and identify the particular color combinations that do not meet standards.
- ➢ A good design regarding low vision is not supposed to have more than **10** color contrast error.
- ➢ Lets check BU website to see …



The Web and Mobile



The Web and Mobile

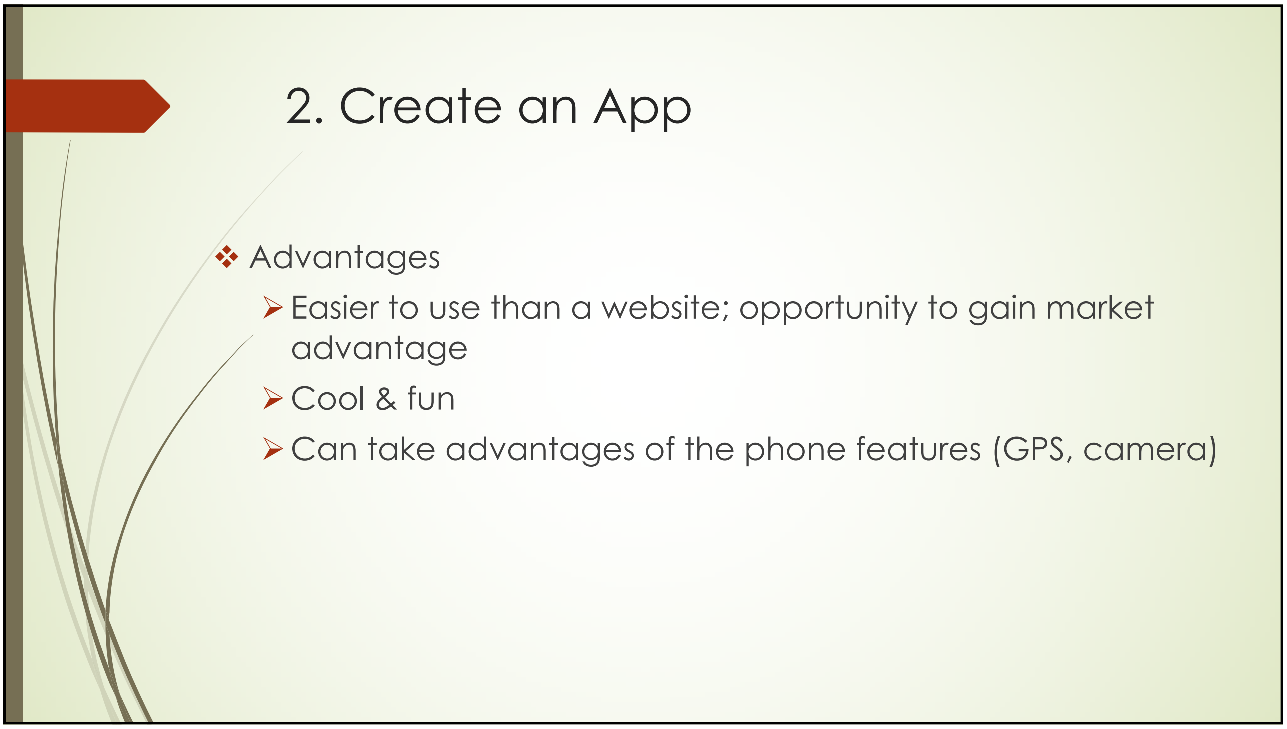
- By some estimates, more people access the World Wide Web on mobile devices today than on desktops or laptops.
- In some parts of the world, mobile is the primary way that people access the web.
- This has affected how web designers work.

Approaches to Mobile Web

- Do nothing
- Create an app
- Separate mobile website
- Responsive design

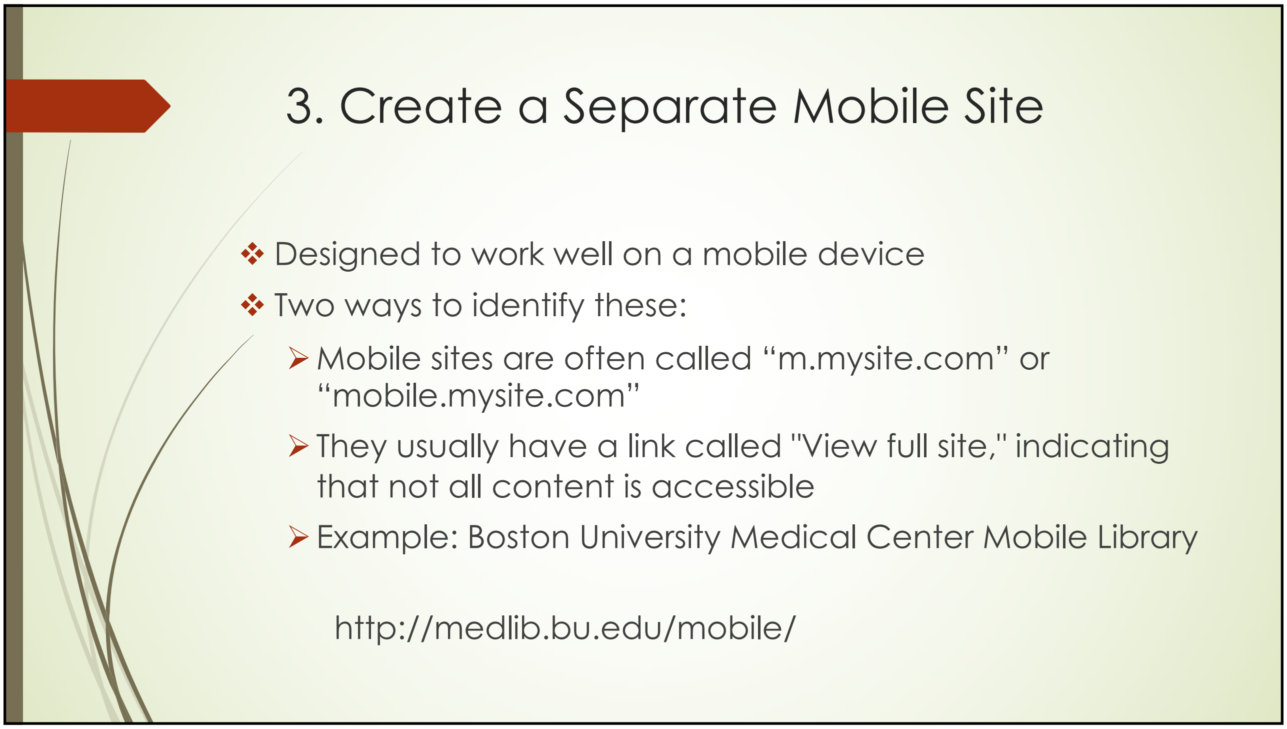
1. Do Nothing

- Advantages:
  - Cheaper – no extra effort
  - User doesn't have to do anything special to find it
- Disadvantages:
  - Lots of zooming and scrolling – hard to use (usability)
  - Hard for people with mobility impairments



2. Create an App

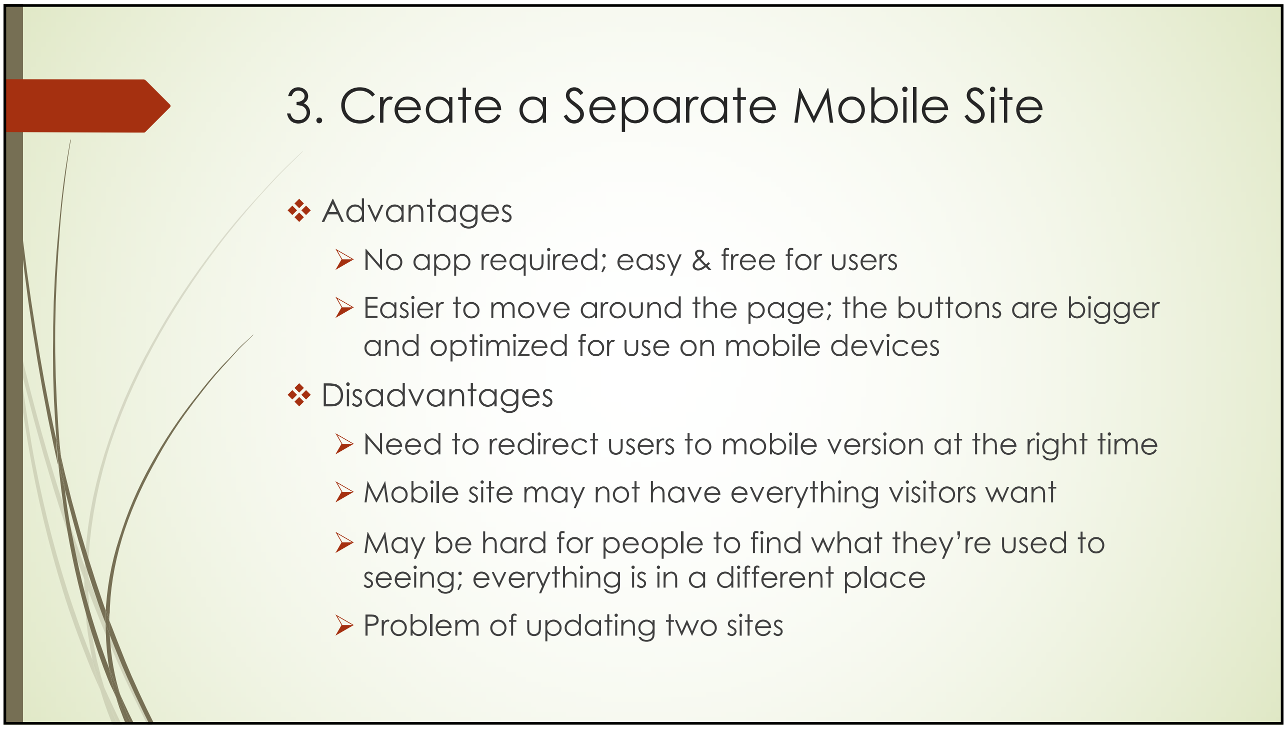
- ❖ Advantages
  - ➢ Easier to use than a website; opportunity to gain market advantage
  - ➢ Cool & fun
  - ➢ Can take advantages of the phone features (GPS, camera)



3. Create a Separate Mobile Site

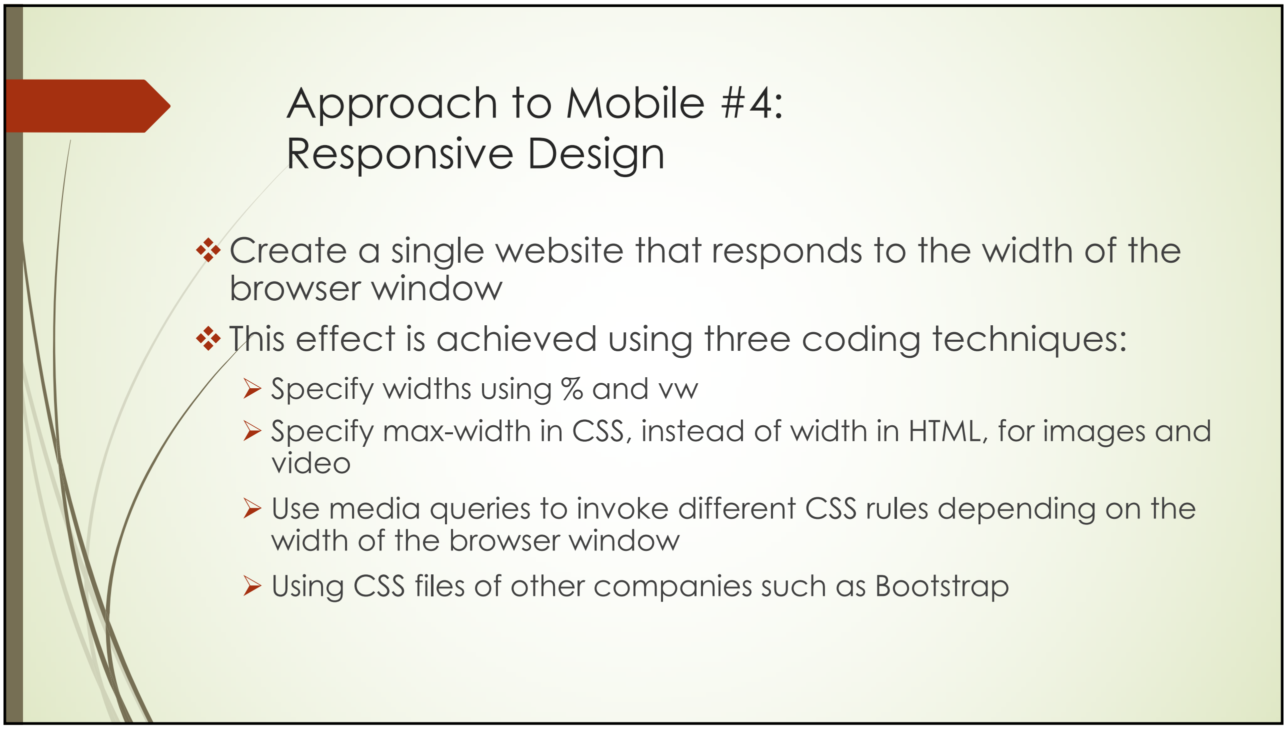
- ❖ Designed to work well on a mobile device
- ❖ Two ways to identify these:
  - ➢ Mobile sites are often called “m.mysite.com” or “mobile.mysite.com”
  - ➢ They usually have a link called "View full site," indicating that not all content is accessible
  - ➢ Example: Boston University Medical Center Mobile Library

http://medlib.bu.edu/mobile/



3. Create a Separate Mobile Site

- ❖ Advantages
  - ➢ No app required; easy & free for users
  - ➢ Easier to move around the page; the buttons are bigger and optimized for use on mobile devices
- ❖ Disadvantages
  - ➢ Need to redirect users to mobile version at the right time
  - ➢ Mobile site may not have everything visitors want
  - ➢ May be hard for people to find what they're used to seeing; everything is in a different place
  - ➢ Problem of updating two sites



Approach to Mobile #4: Responsive Design

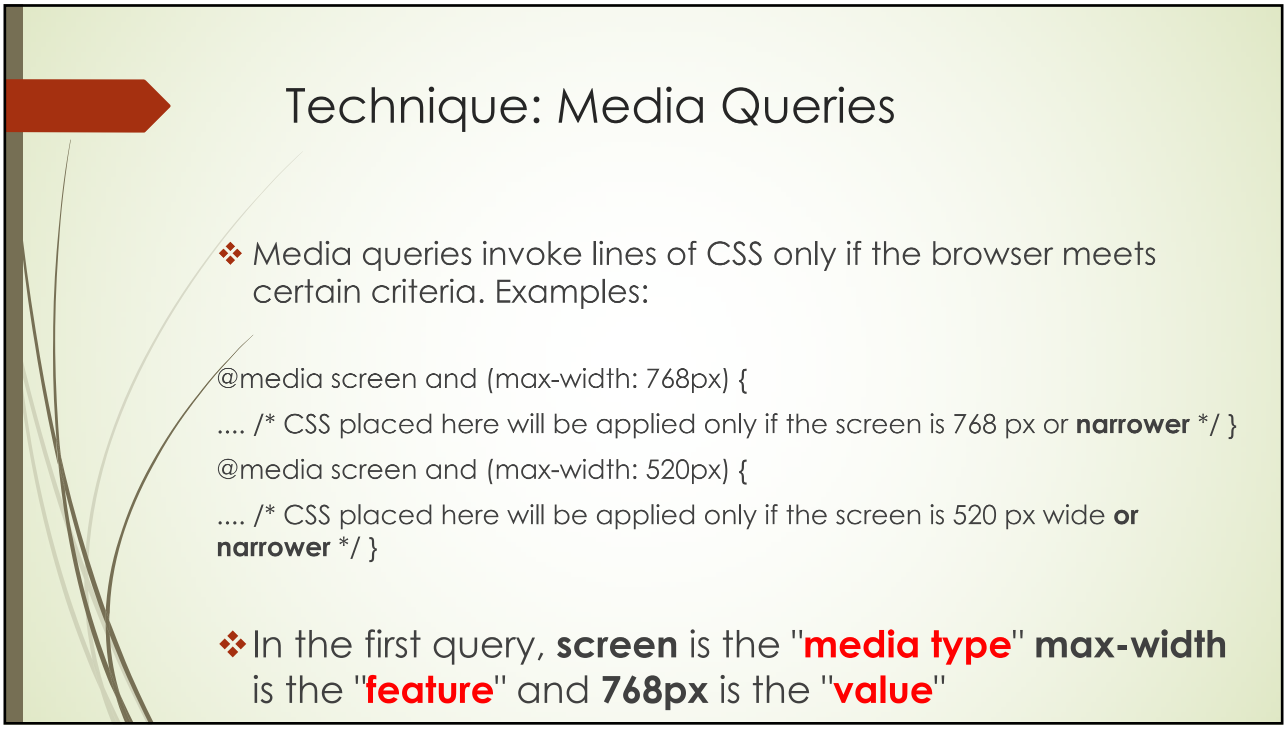
- ❖ Create a single website that responds to the width of the browser window
- ❖ This effect is achieved using three coding techniques:
  - ➢ Specify widths using % and vw
  - ➢ Specify max-width in CSS, instead of width in HTML, for images and video
  - ➢ Use media queries to invoke different CSS rules depending on the width of the browser window
  - ➢ Using CSS files of other companies such as Bootstrap

Approach to Mobile #4: Responsive Design

- ❖ Advantages
  - ➢ No need to maintain two sites
  - ➢ Mobile users get everything that desktop users get
  - ➢ Easier to use on phones and tablets
- ❖ Disadvantages
  - ➢ Takes a LOT of thought and planning to make sure that everything works no matter how wide the screen is.
  - ➢ Code is harder to test and debug because multiple style sheets are in use
  - ➢ Performance problem

Technique: Max-Width for Images

- ❖ Remove width and height attributes from <img> tags
- ❖ Remove width and height properties for images from CSS
- ❖ Instead, specify max-width:100% for images in CSS
- ❖ If the window is wide enough, the image will appear at its natural size.
- ❖ Otherwise, browser will make it small enough to fit.
- ❖ To use this technique, you must make the image the right size in an image editor like Photoshop or GIMP.
- ❖ Since you can no longer use the height and width attributes in the img tag, you can no longer rescale the image in HTML.



Technique: Media Queries

- Media queries invoke lines of CSS only if the browser meets certain criteria. Examples:

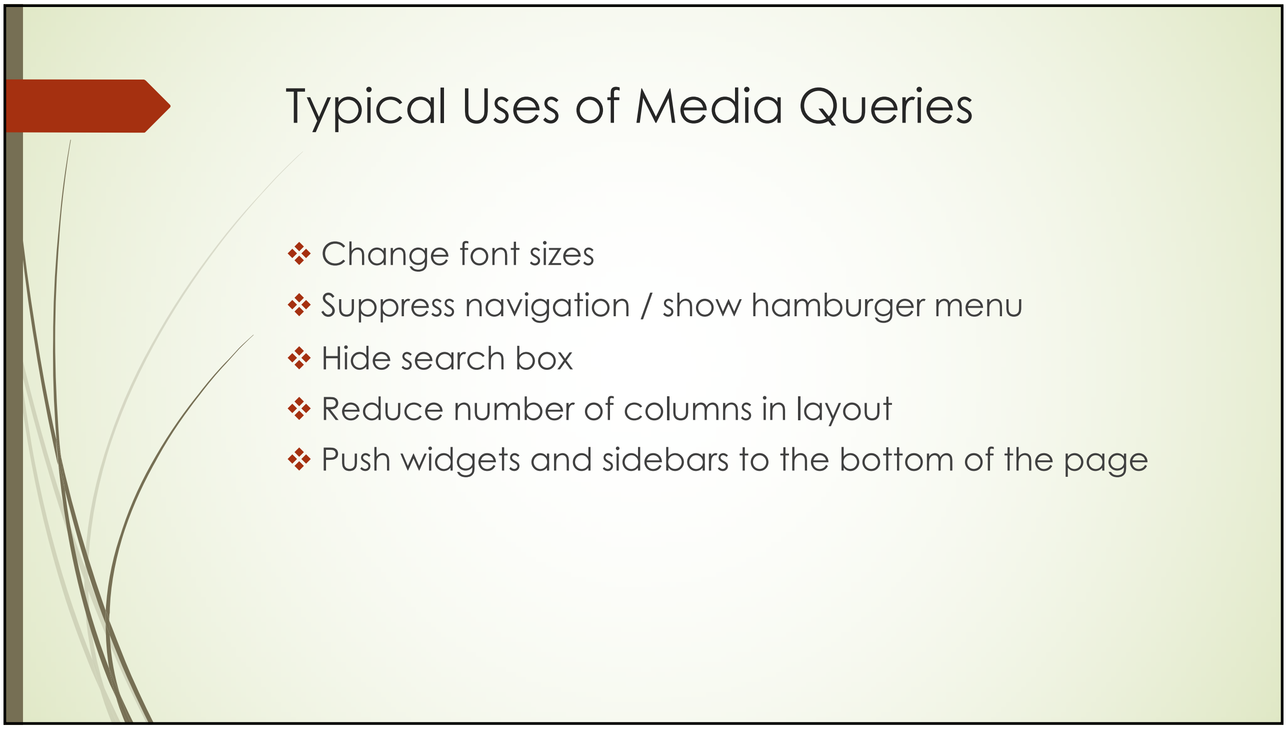
@media screen and (max-width: 768px) {

.... /* CSS placed here will be applied only if the screen is 768 px or **narrower** */ }

@media screen and (max-width: 520px) {

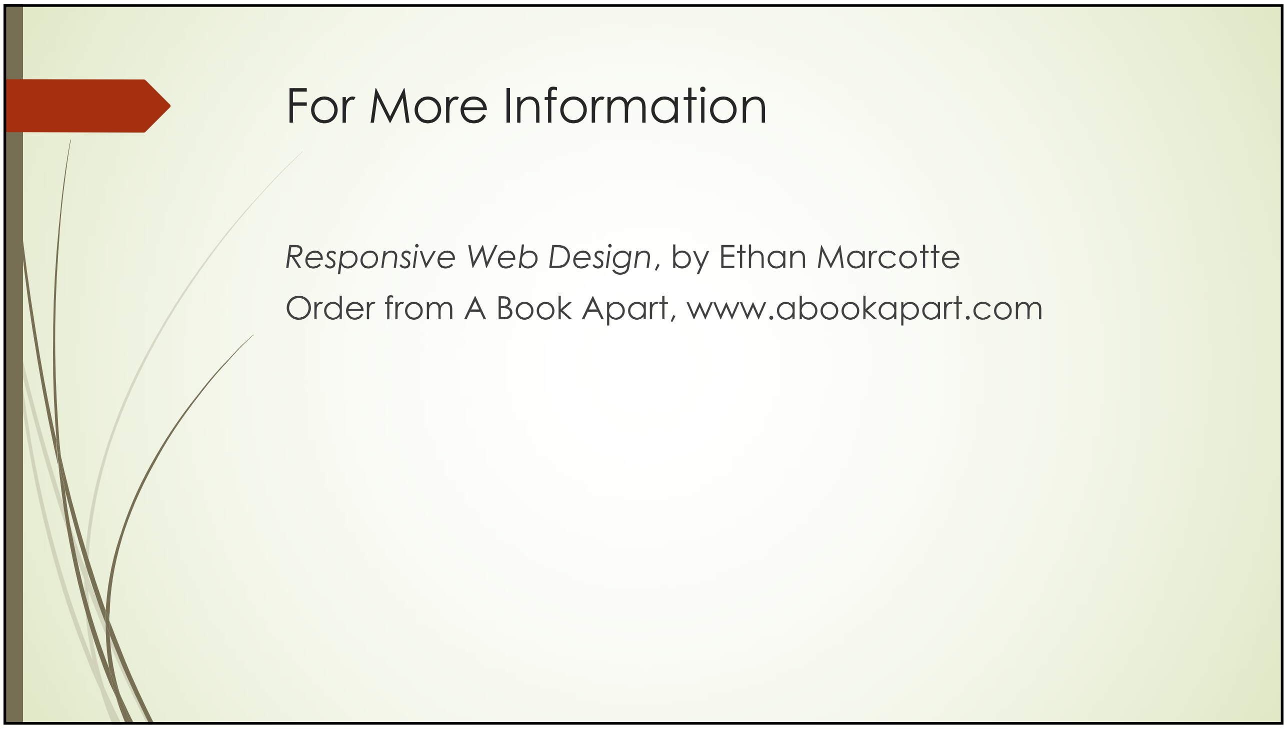
.... /* CSS placed here will be applied only if the screen is 520 px wide **or narrower** */ }

- In the first query, **screen** is the "**media type**" **max-width** is the "**feature**" and **768px** is the "**value**"



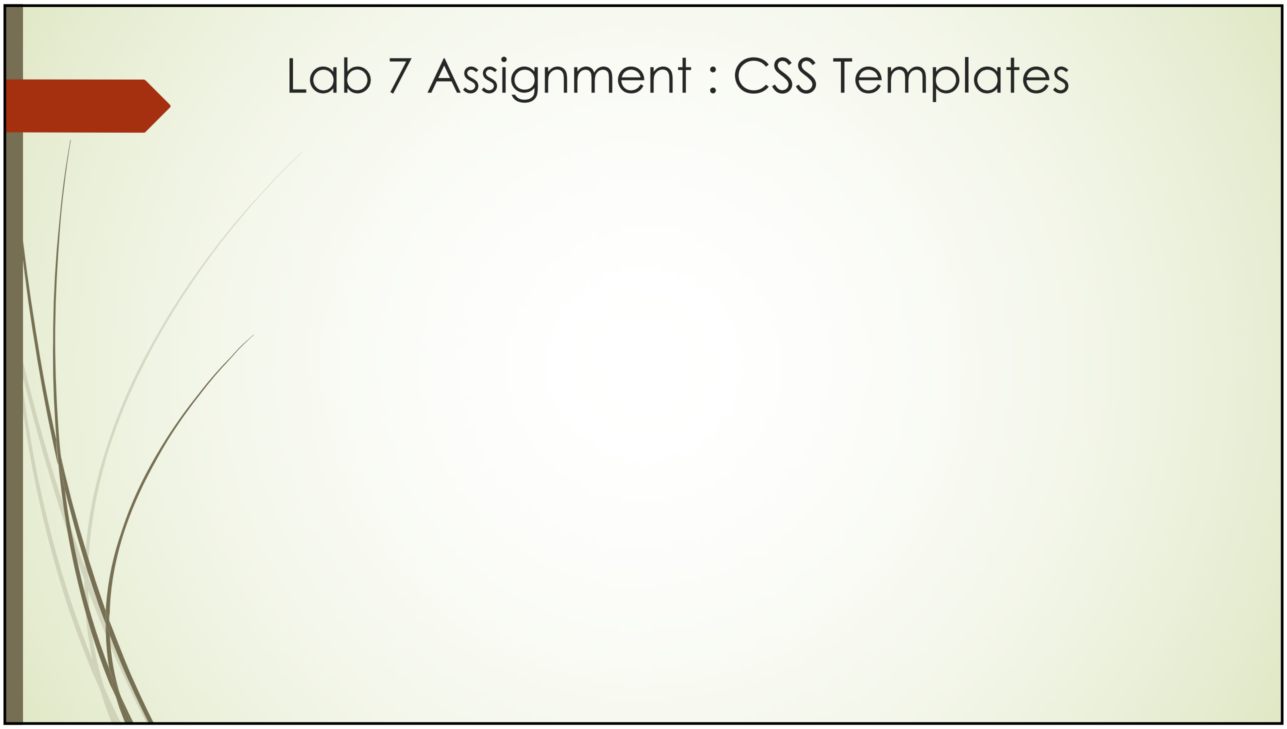
Typical Uses of Media Queries

- Change font sizes
- Suppress navigation / show hamburger menu
- Hide search box
- Reduce number of columns in layout
- Push widgets and sidebars to the bottom of the page



For More Information

Responsive Web Design, by Ethan Marcotte
Order from A Book Apart, www.abookapart.com



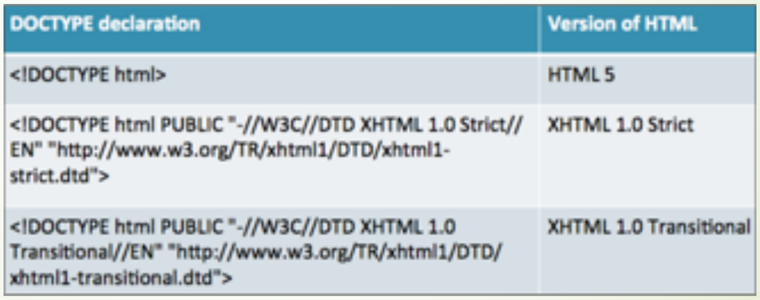
Lab 7 Assignment : CSS Templates

Lab 7 Assignment : CSS Templates

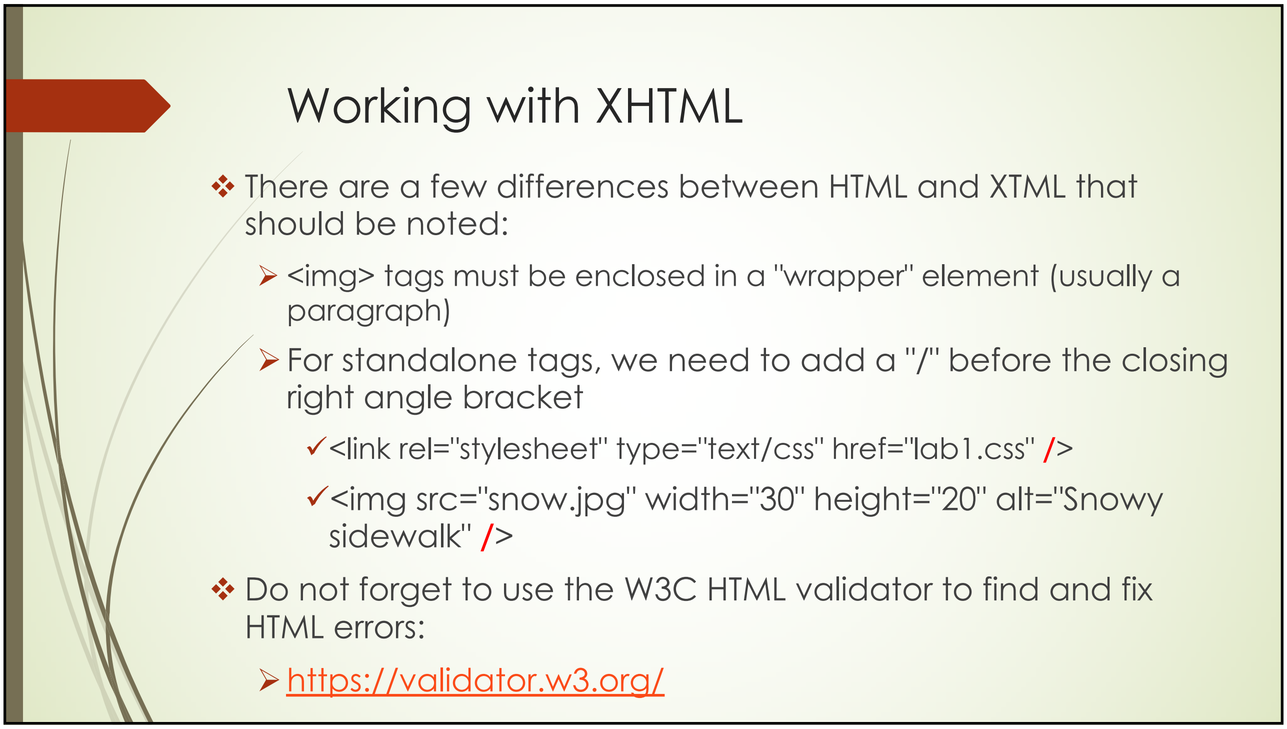
- ❖ For Lab 7 assignment you are supposed to use free CSS templates provided by different componies to make a full website.
  - ✓ It is different from making a website from scratch as you do not need to make everything by yourself.
  - ✓ What you should do is modifying the template by changing different css properties and adding your own content.
  - ✓ The following websites are where you can find beautiful free templates:
    - ➢ https://templated.co
    - ➢ https://html5up.net/

Lab 7 Assignment : CSS Templates: XHTML

- ❖ Some templates on free template sites are written in XHTML 1.0, an older version of HTML.
- ❖ How can you tell? Check the DOCTYPE declaration.

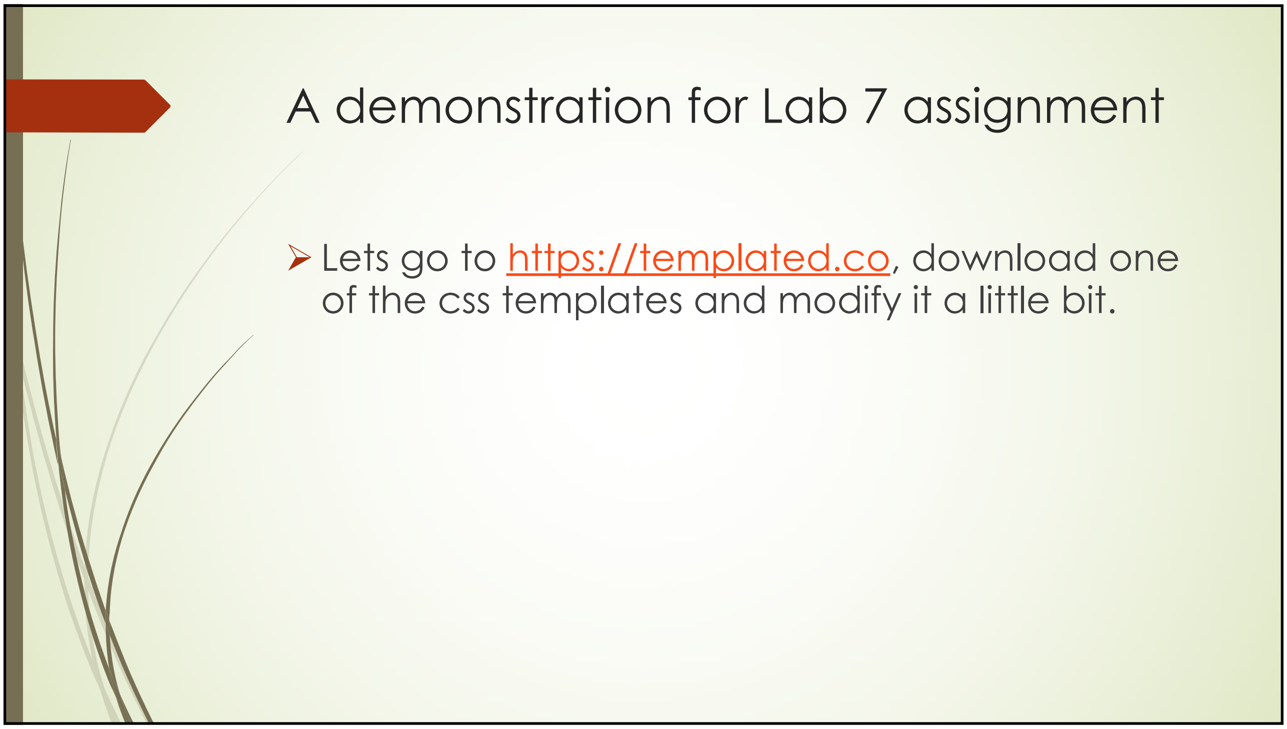


DOCTYPE declaration	Version of HTML
<!DOCTYPE html>	HTML 5
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Strict//EN" "http://www.w3.org/TR/xhtml1/DTD/xhtml1-strict.dtd">	XHTML 1.0 Strict
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN" "http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">	XHTML 1.0 Transitional



Working with XHTML

- There are a few differences between HTML and XTML that should be noted:
  - <img> tags must be enclosed in a "wrapper" element (usually a paragraph)
  - For standalone tags, we need to add a "/" before the closing right angle bracket
    - ✓<link rel="stylesheet" type="text/css" href="lab1.css" />
    - ✓<img src="snow.jpg" width="30" height="20" alt="Snowy sidewalk" />
- Do not forget to use the W3C HTML validator to find and fix HTML errors:
  - https://validator.w3.org/



A demonstration for Lab 7 assignment

- Lets go to https://templated.co, download one of the css templates and modify it a little bit.