



Lebanese University

Faculty of Information

Branch II

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PhD in Data Mining - Computer Science

Web Design & Development

Semester 3

Web Design

The graphical user interface to information stored on computers running web servers connected to the Internet.



Domain Name

What is a **Domain Name**?

Whenever a person types your Domain Name, the hosting company transforms all the files connected to your IP address and returns all the images, videos and words on your website. Each domain name is unique as like your register address. Whenever you open a new website, you will be able to select a name that is a reflection of your brand.

Domain Name

› ICANN - The Internet Corporation for Assigned Numbers & Names

- Non-profit organization
- Main function is to coordinate the assignment of:
 - › Internet domain names
 - › IP address numbers
 - › Protocol parameters
 - › Protocol port numbers.



Domain Name

Locates an organization or other entity on the Internet

Domain Name System

- › Divides the Internet into logical groups and understandable names
- › Associates unique computer IP Addresses with the text-based domain names you type into a web browser
Browser: `http://google.com`
IP Address: `74.125.225.78`

IP Address

- › Each device connected to the Internet has a unique numeric IP address.
- › These addresses consist of a set of four groups of numbers, called octets.

74.125.225.78 will get you Google!

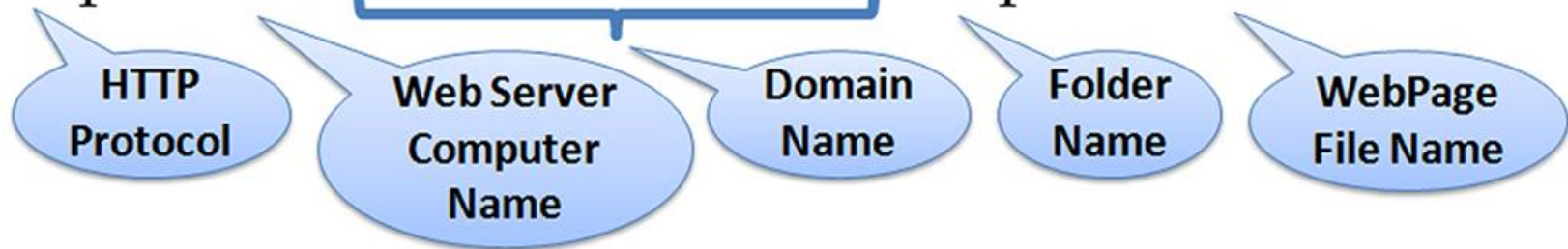
- › An IP address may correspond to a domain name.

> URL

URL – Uniform Resource Locator

a type of URI which represents the network location of a resource such as a web page, a graphic file, or an MP3 file.
Uses HTTP (Hypertext Transfer Protocol)

<http://www.webdevbasics.net/chapter1/index.html>



Web Hosting

Web Hosting is the service that allows others to view your website on the Internet. A web host offers space on their server to allow other devices worldwide to access your website via a network or modem.



Web Client

Browser Request



Server Response



Web Server

Web Hosting

› **Client/Server** can describe a relationship between two computer programs – the "**client**" and the "**server**".

› **Client**

requests some type of service (such as a file or database access) from the server.

› **Server**

fulfills the request and transmits the results to the client over a network

Web Hosting

Web Client

- › Connected to the Internet when needed
- › Usually runs web browser (client) software (*such as Internet Explorer or Firefox*)
- › Uses HTTP (Hypertext Transfer Protocol)
- › Requests web pages from server
- › Receives web pages and files from server

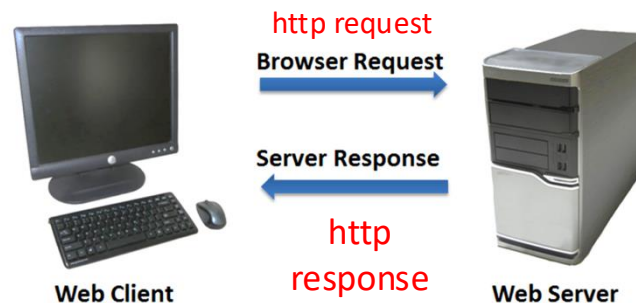
Web Hosting

Web Server

- › Continually connected to the Internet
- › Runs web server software
(*such as Apache or Internet Information Server*)
- › Uses HTTP (Hypertext Transfer Protocol)
- › Receives request for the web page
- › Responds to request and transmits status code, web page, and associated files

Web Hosting

- › A set of rules for exchanging files such as text, graphic images, sound, video, and other multimedia files on the Web.



- › Web browsers send HTTP requests for web pages and their associated files.
- › Web servers send HTTP responses back to the web browsers.

Web Hosting

Types of Web Hosting

Below are the different types of web hosting as follows:

- › Shared Hosting
- › VPS Hosting
- › Dedicated Server Hosting
- › Cloud Hosting
- › WordPress hosting

Web Hosting



Shared Hosting:

Hosted websites on the same server share all their memory, computer storage, disk storage, and other resources. there are various disadvantages such as many websites share the same server which leads to having the same resources and slowing down the websites.

If one website consumes more power due to increased traffic or faulty code, others have to face the problem. This phenomenon called the “bad neighbor effect”.

Web Hosting



VPS Hosting:

VPS stands for Virtual Private Server Hosting. However, you still share a server with other users, however on the server your web host gives you a separate partition. You will have dedicated server space, as well as reserved computer power and memory. VPS hosting can be excellent for medium-sized enterprises with fast increasing websites.

VPS provides more reliability and stability than shared hosting.

Web Hosting



Dedicated Server Hosting:

In a dedicated hosting type, the website owner has full control over the server on which the website is stored. i.e. the owner has complete admin and root access. Because of this, it allows faster executions and high-level security and all the resources are under the control of the owner.

One of the main advantages of dedicated hosting is that there is no problem of bad neighbor effect as no other websites are involved to use the website's resources.

Web Hosting



Word-press hosting:

Word-Press Hosting is a little bite like Shared hosting, but this was created for owners of WordPress sites. Your server is specifically configured to WordPress and there are plugins installed for important items such as caching and safety on your site. Because your site is extremely optimized, it loads more quickly and runs less troubleshoot the problem.

Web Hosting



Cloud Hosting:

Cloud hosting is currently, with no downtime, the most reliable solution on the market. It is the same as VPS hosting as in this type virtual machines are used. Your host offers a cluster of servers with cloud hosting. Each server is replicated for your files and resources.

If one of the cloud servers is busy or issues, your traffic is routed to another server in the cluster automatically. It is more scalable as it combines several computers into a virtual server that can then provide its resources based on their requirements.

Web Sites

Static Websites

A **Static Website** is displayed in a web browser exactly as it is stored. It contains web pages with fixed content coded in HTML and stored on a web server. It does not change, it stays the same, or "static" for every viewer of the site.

A static website does not require web programming or database design. Static is the most basic form of website and are the most simple to create and are perfect for small scale sites. Maintaining a large number of static pages can become a time consuming and impractical hassle very quickly. If you require a website with hundreds of pages and a ton of content, a dynamic website may be for you.

Web Sites

Static Websites

Advantages of static websites

- › Static websites take less time to build and deploy than dynamic websites.
- › You can duplicate the basic code of your static web pages to keep elements consistent while making slight changes to differentiate.
- › Static websites tend to be more secure.
- › It's easier for search engines to rank static websites because they usually load faster.
- › Building static websites doesn't require complex software.
- › You can change the layout and design of every page on a static website.
- › It's easier to restore a static website after a crash or [DDoS attack](#) by redeploying the codebase.

Web Sites

Static Websites

Disadvantages of static websites

- › Making updates to static websites can be challenging and time-consuming, especially if they're large.
- › Once you've built the basic structure, it can be hard to scale a website to add new content.
- › Because of the effort needed to update static websites, yours may end up with stagnant content that makes your company or brand feel outdated.
- › You can't interact with or create unique experiences for visitors.

Web Sites

Dynamic Websites

A **Dynamic Website** requires web programming and database design. A dynamic website contains information and content that changes, depending on factors such as the viewer of the site, the time of the day, the time zone, or the native language of the country the viewer).

The content of your site (text/images) is stored on a database. When the information is updated or changed within the database, it changes on the site.

When a dynamic site is accessed, pages are generated on-the-fly (or in *real-time*) to the user based on this data from the visitor.

Web Sites

Dynamic Websites



Front End

- Markup and web languages such as HTML, CSS and Javascript
- Asynchronous requests and Ajax
- Specialized web editing software
- Image editing
- Accessibility
- Cross-browser issues
- Search engine optimisation



Back End

- Programming and scripting such as Python, Ruby and/or Perl
- Server architecture
- Database administration
- Scalability
- Security
- Data transformation
- Backup

Web Sites

Dynamic Websites

Advantages of dynamic websites

- › They provide more website functionality and enable user interaction.
- › Dynamic sites let you request and store information in an organized way.
- › They display content based on the user's needs.
- › These type of websites enable additional website flexibility by allowing connection to a CMS.
- › They allow multiple users to adjust the content.
- › It is less costly to make adjustments and changes versus a static website.
- › Dynamic sites are more likely to attract recurring customers and visitors.

Web Sites

Dynamic Websites

Disadvantages of dynamic websites

- › Functions like building the site foundation, creating database connections, and adding other features can make a dynamic website more expensive than a static website.
- › There can be design and layout limitations when it comes to displaying content on your dynamic website.



Top 5 WordPress Alternatives:

➤ 1. Joomla

Joomla is also another Content Management system which works on model view controller architecture. It is one of the biggest competitions for WordPress.

➤ 2. Drupal

Drupal is another alternative to WordPress which is more digital. Being preferred for digital solutions Drupal is not suitable for beginners to use. The various advantages of Drupal include creating blogs, personal websites, forums, and even social networking sites.



Top 5 WordPress Alternatives:

› 3. **Craft CMS**

Although Craft CMS is not that famous, it is extensively being used by Netflix and Salesforce websites. It is developer friendly due to its extensive back end features for your application.

› 4. **Shopify**

Unlike other sites, e-commerce sites also require alterations and demand to have something easy. Among all these WordPress alternatives, Shopify is the best alternative to WordPress in this regard. It is simple and helps in growing your business the easy way.

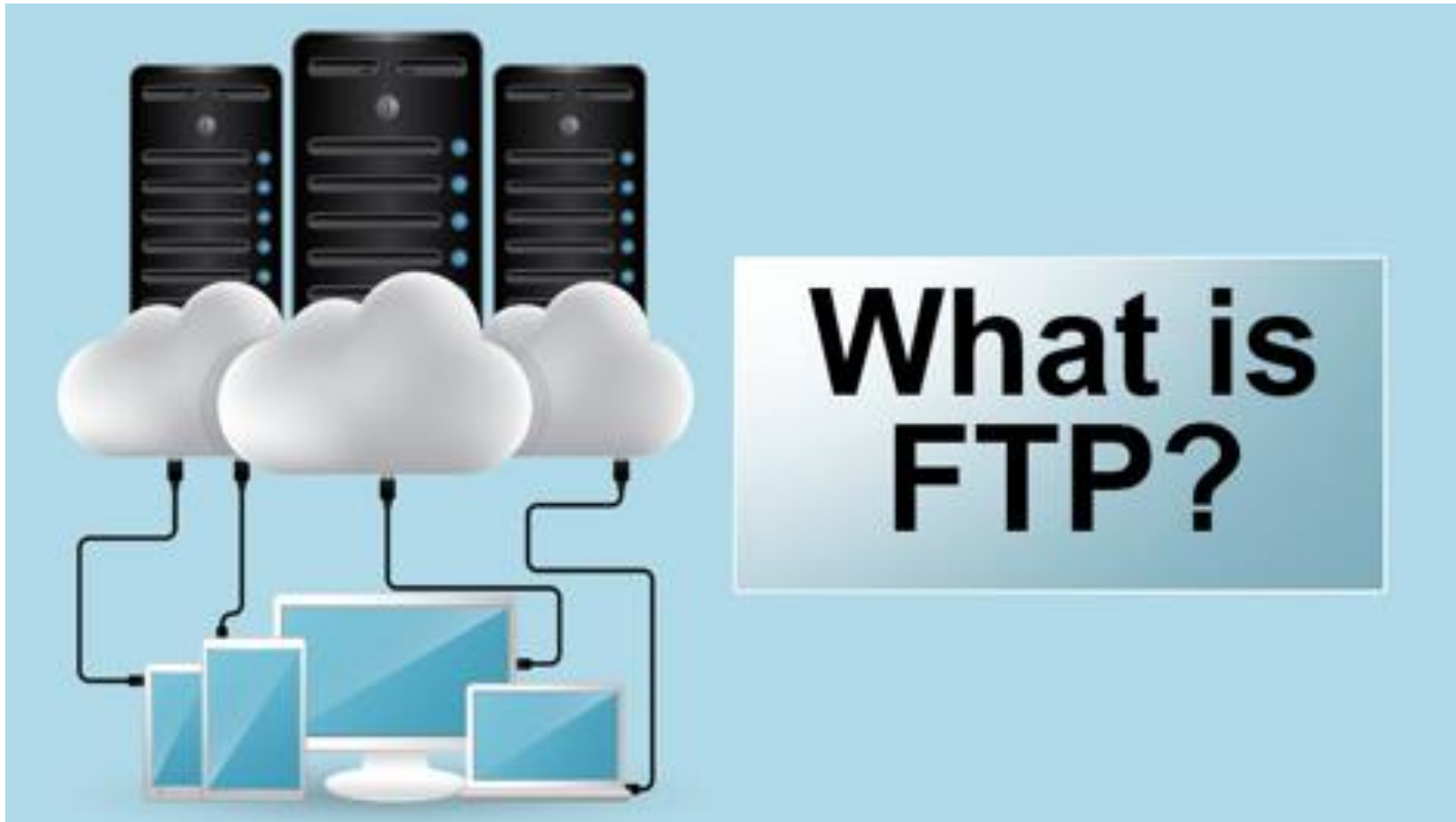


Top 5 WordPress Alternatives:

› 5. Wix

Wix is one of the oldest and widely used websites which is used to build sites. It was launched in 2006 and has been in the industry since then. One of the best catches of Wix is that it provides animation features that animate texts and other elements. It is one of the most intriguing factors of Wix.

> FTP



FTP

Introduction to FTP

FTP stands for File Transfer Protocol. It is a protocol that is used for transferring a file from one location to another i.e. from one host to another host. It is a standard mechanism that is provided by TCP/IP.

How does it work?

It uses TCP services. It needs two TCP connections. One is Control connection and another is Data connection. For control connection, it uses port 21 and for data connection, it uses port 20

➤ FTP

- A set of rules that allow files to be exchanged between computers on the Internet.
- Web developers commonly use FTP to transfer web page files from their computers to web servers.
- FTP is also used to download programs and files from other servers to individual computers.

E-Mail

-  ► Sending E-mail
 - SMTP Simple Mail Transfer Protocol
-  ► Receiving E-mail
 - POP (POP3) Post Office Protocol
 - IMAP Internet Mail Access Protocol

Internet Protocols

► Protocols

- Rules that describe the methods used for clients and servers to communicate with each other over a network.
- There is no *single* protocol that makes the Internet and Web work.
- A number of protocols with specific functions are needed.



What is HTML?

- ▶ HTML:

The set of markup symbols or codes placed in a file intended for display on a Web browser page.

- ▶ The World Wide Web Consortium (<http://w3c.org>) sets the standards for HTML and its related languages.

HTML Elements

- Each markup code represents an HTML **element** .
- Each element has a purpose.

Most elements are coded as a pair of tags:
an opening tag and a closing tag.

- Tags are enclosed in angle brackets, "<" and ">" symbols.



What is HTML5 ?

- Newest draft version of HTML/XHTML
- Supported by modern browsers
 - Safari, Google Chrome, Firefox, Internet Explorer 9
- Intended to be backwards compatible
- Adds new elements
- Adds new functionality
 - Edit form data
 - Native video and audio
 - And more!



Source: W3C <http://www.w3.org/html/logo/>



Head & Body Sections

- **Head Section**

Contains information that describes the Web page document

`<head>`

...head section info goes here

`</head>`

- **Body Section**

Contains text and elements that display in the Web page document

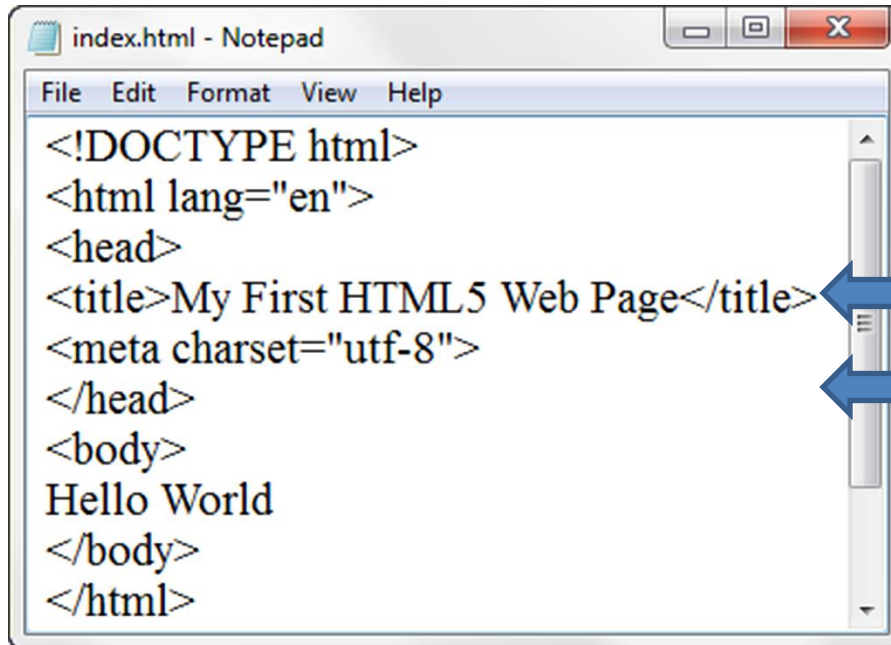
`<body>`

...body section info goes here

`</body>`

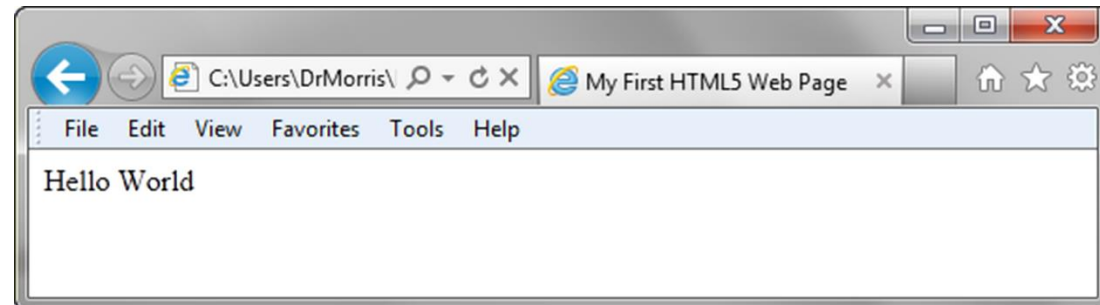


Head & Body Sections



```
index.html - Notepad
File Edit Format View Help
<!DOCTYPE html>
<html lang="en">
<head>
<title>My First HTML5 Web Page</title>
<meta charset="utf-8">
</head>
<body>
Hello World
</body>
</html>
```

Title Element
Meta Element





Paragraph Element

- Paragraph element

`<p> ...paragraph goes here... </p>`

- Groups sentences and sections of text together.
- Block Display – Configures empty space above and below



Line Break Element

- Line Break element
 - Stand-alone, or void tag

...text goes here `<br>`

This starts on a new line....

- Causes the next element or text to display on a new line



Blockquote Element

- Blockquote element
 - Indents a block of text for special emphasis

<blockquote>

...text goes here...

</blockquote>

- Block Display – Configures empty space above and below



Phrase Elements

- Indicate the context and meaning of the text

Element	Example	Usage
	bold text	Text that has no extra importance but is styled in bold font by usage and convention
	emphasized text	Causes text to be emphasized in relation to other text; usually displayed in italics
<i>	italicized text	Text that has no extra importance but is styled in italics by usage and convention
<mark>	mark text	Text that is highlighted in order to be easily referenced (HTML5 only)
<small>	small text	Legal disclaimers and notices (“fine print”) displayed in small font-size
	strong text	Strong importance; causes text to stand out from surrounding text; usually displayed in bold
<sub>	sub text	Displays a subscript as small text below the baseline
<sup>	sup text	Displays a superscript as small text above the baseline



HTML Lists

- Unordered List
- Ordered List
- Description List
formerly called a definition list

Unordered List

- Displays a bullet, or list marker, before each entry in the list.
- `<ul>`
Contains the unordered list
- `<li>`
Contains an item in the list

- TCP
- IP
- HTTP
- FTP



Unordered List Example

TCP

IP

HTTP

FTP

- TCP
- IP
- HTTP
- FTP



Ordered List

- Displays a numbering or lettering system to itemize the information contained in the list
- `<ol>`

Contains the ordered list

- type attribute determines numbering scheme of list, default is numerals

- `<li>`

Contains an item in the list



Ordered List Example

Apply to school

Register for course

Pay tuition

Attend course

1. Apply to school
2. Register for course
3. Pay tuition
4. Attend course



Description List

- Useful to display a list of terms and descriptions or a list of FAQ and answers
 - `<dl>`
Contains the description list
 - `<dt>`
Contains a term/phrase/sentence
Configures empty space above and below the text
 - `<dd>`
Contains a description of the term/phrase/sentence
 - Indents the text
 - Configures empty space above and below the text



Description List Example

<dl>

<dt>IP</dt>

<dd>Internet Protocol</dd>

<dt>TCP</dt>

<dd>Transmission Control Protocol</dd>

</dl>

IP

Internet Protocol

TCP

Transmission Control Protocol



Special Characters

- Display special characters such as quotes, copyright symbol, etc.

Character

Code

©

©

<

<

>

>

&

&



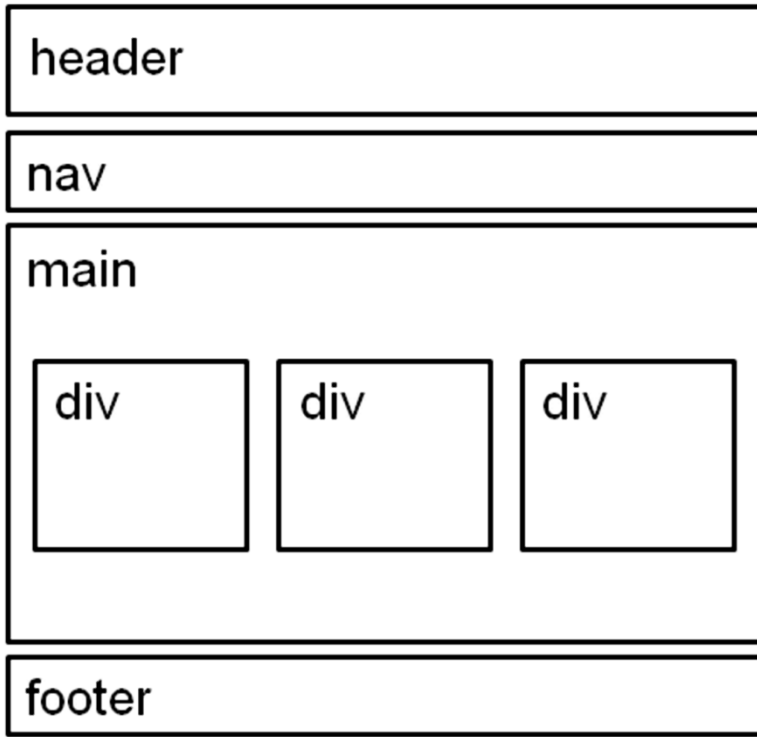
Div Element

- ▶ Configures a structural block area or “division” on a web page with empty space above and below.
- ▶ Can contain other block display elements, including other div elements

```
<div>Home Services Contact</div>
```



HTML5 Structural Elements



- ▶ **header Element**
`<header></header>`
Contains the web page document's headings
- ▶ **nav Element**
`<nav></nav>`
Contains web page document's main navigation
- ▶ **main Element**
`<main></main>`
Contains the web page document's main content
- ▶ **footer Element**
`<footer></footer>`
Contains the web page document's footer



HTML5 Structural Elements

`<body>`

`<header>` *document headings go here* `</header>`

`<nav>` *main navigation goes here* `</nav>`

`<main>` *main content goes here* `</main>`

`<footer>` *document footer information goes here* `</footer>`

`</body>`





Anchor Element

- Specifies a hyperlink reference (href) to a file
- Text between the `<a>` and `</a>` is displayed on the web page.

`<a href=" " >Contact Us</a>`

➤ `contact.html`

- href Attribute
 - Indicates the file name or URL



Absolute & Relative Hyperlinks

- Absolute link
 - Link to a different website

```
<a href="http://yahoo.com">Yahoo</a>
```

- Relative link
 - Link to pages on your own site

```
<a href="index.htm">Home</a>
```



E-Mail Hyperlink

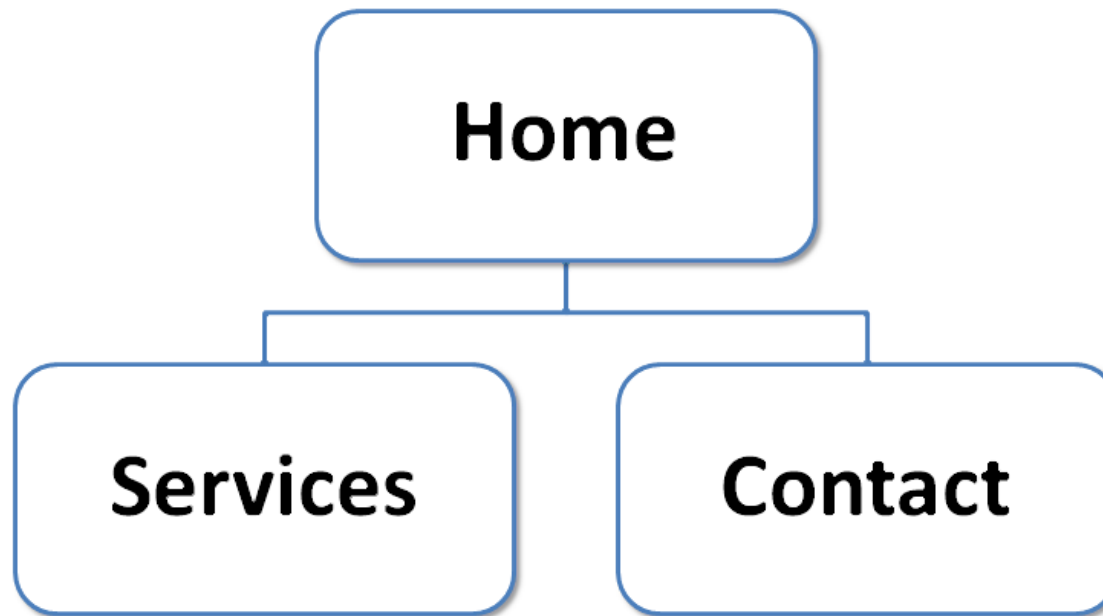
- Automatically launch the default mail program configured for the browser
- If no browser default is configured, a message is displayed

`<a href="mailto:me@gmail.com">me@gmail.com</a>`



Hyperlinks

- Hands-On Practice





Comment Tag

You can add comments to your HTML source by using the following syntax:

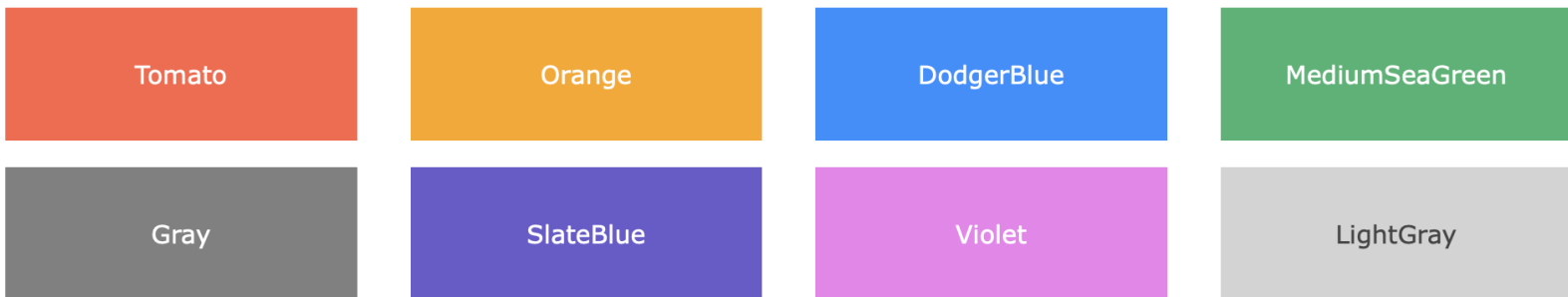
```
<!-- Write your comments here -->
```



HTML Colors

HTML colors are specified with predefined color names, or with RGB, HEX, HSL, RGBA, or HSLA values.

In HTML, a color can be specified by using a color name:



HTML supports [140 standard color names](#).



HTML Colors

Background Color

You can set the background color for HTML elements:

```
<h1 style="background-color:DodgerBlue;">Hello World</h1>  
<p style="background-color:Tomato;">Lorem ipsum...</p>
```

Hello World

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed diam nonummy nibh euismod tincidunt ut laoreet dolore magna aliquam erat volutpat. Ut wisi enim ad minim veniam, quis nostrud exerci tation ullamcorper suscipit lobortis nisl ut aliquip ex ea commodo consequat.



HTML Colors

Text Color

You can set the color of text:

Hello World

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed diam nonummy nibh euismod tincidunt ut laoreet dolore magna aliquam erat volutpat.

Ut wisi enim ad minim veniam, quis nostrud exerci tation ullamcorper suscipit lobortis nisl ut aliquip ex ea commodo consequat.

```
<h1 style="color:Tomato;">Hello World</h1>  
<p style="color:DodgerBlue;">Lorem ipsum...</p>  
<p style="color:MediumSeaGreen;">Ut wisi enim...</p>
```



HTML Colors

Border Color

You can set the color of borders:

Hello World

Hello World

Hello World

```
<h1 style="border:2px solid Tomato;">Hello World</h1>  
<h1 style="border:2px solid DodgerBlue;">Hello World</h1>  
<h1 style="border:2px solid Violet;">Hello World</h1>
```



HTML Style

The HTML style attribute is used to add styles to an element, such as color, font, size, and more.

Example

I am Red

I am Blue

I am Big



HTML Heading

HTML headings are titles or subtitles that you want to display on a webpage.

Example

Heading 1

Heading 2

Heading 3

Heading 4

Heading 5

Heading 6



HTML Heading

HTML headings are defined with the `<h1>` to `<h6>` tags.

`<h1>` defines the most important heading.

`<h6>` defines the least important heading.

Example

```
<h1>Heading 1</h1>
```

```
<h2>Heading 2</h2>
```

```
<h3>Heading 3</h3>
```

```
<h4>Heading 4</h4>
```

```
<h5>Heading 5</h5>
```

```
<h6>Heading 6</h6>
```



HTML Heading

Headings Are Important

Search engines use the headings to index the structure and content of your web pages.

Users often skim a page by its headings. It is important to use headings to show the document structure.

`<h1>` headings should be used for main headings, followed by `<h2>` headings, then the less important `<h3>`, and so on.

Note: Use HTML headings for headings only. Don't use headings to make text **BIG** or **bold**.



HTML Attributes

HTML attributes provide additional information about HTML elements.

All HTML elements can have **attributes**

Attributes provide **additional information** about elements

Attributes are always specified in **the start tag**

Attributes usually come in name/value pairs

like: **name="value"**



HTML Attributes

The href Attribute

The `<a>` tag defines a hyperlink.

The href attribute specifies the URL of the page the link goes to:

Example

```
<a href="https://www.w3schools.com">Visit W3Schools</a>
```



HTML Attributes

The **src** Attribute

The `<img>` tag is used to embed an image in an HTML page. The `src` attribute specifies the path to the image to be displayed:

Example

```

```



HTML Attributes

There are two ways to specify the URL in the src attribute:

1. Absolute URL - Links to an external image that is hosted on another website.

Example: `src="https://www.w3schools.com/images/img_girl.jpg"`.

2. Relative URL - Links to an image that is hosted within the website. Here, the URL does not include the domain name. If the URL begins without a slash, it will be relative to the current page. Example: `src="img_girl.jpg"`. If the URL begins with a slash, it will be relative to the domain. Example: `src="/images/img_girl.jpg"`.



HTML Attributes

The width and height Attributes

The `<img>` tag should also contain the width and height attributes, which specify the width and height of the image (in pixels):

Example

```

```



HTML Attributes

The alt Attribute

The required alt attribute for the tag specifies an alternate text for an image, if the image for some reason cannot be displayed. This can be due to a slow connection, or an error in the src attribute, or if the user uses a screen reader.

Example

```

```



HTML Attributes

The style Attribute

The style attribute is used to add styles to an element, such as color, font, size, and more.

Example

```
<p style="color:red;">This is a red paragraph.</p>
```



HTML Attributes

The lang Attribute

You should always include the lang attribute inside the `<html>` tag, to declare the language of the Web page.

This is meant to assist search engines and browsers.

The following example specifies English as the language:

```
<!DOCTYPE html>  
<html lang="en">  
<body>  
...  
</body>  
</html>
```



HTML Attributes

The title Attribute

The title attribute defines some extra information about an element.

The value of the title attribute will be displayed as a tooltip when you mouse over the element:

Example

```
<p title="I'm a tooltip">This is a paragraph.</p>
```



HTML Attributes

Always Quote Attribute Values

The HTML standard does not require quotes around attribute values.

However, W3C **recommends** quotes in HTML, and **demands** quotes for stricter document types like XHTML.

Good:

```
<a href="https://www.w3schools.com/html/">Visit our HTML  
tutorial</a>
```

Bad:

```
<a href=https://www.w3schools.com/html/>Visit our HTML  
tutorial</a>
```

HTML Attributes

Single or Double Quotes?

Double quotes around attribute values are the most common in HTML, but single quotes can also be used.

In some situations, when the attribute value itself contains double quotes,

it is necessary to use single quotes:

```
<p title='John "ShotGun" Nelson'>
```

Or vice versa:

```
<p title="John 'ShotGun' Nelson">
```

> HTML

HTML is Not Case Sensitive

HTML tags are not case sensitive:

`<P>` means the same as `<p>`.

The HTML standard does not require lowercase tags, but W3C **recommends** lowercase in HTML, and **demands** lowercase for stricter document types like XHTML.



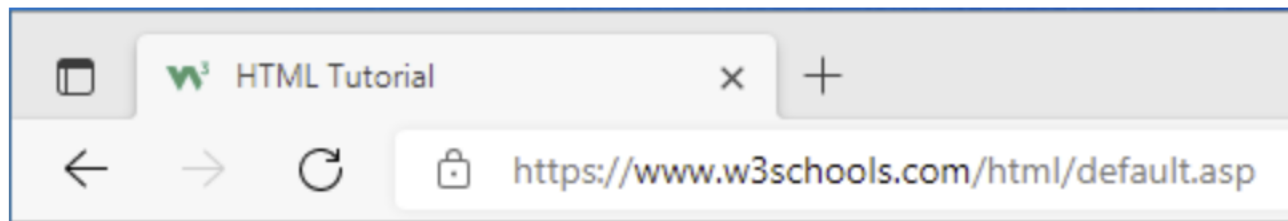
HTML Favicon

A favicon is a small image displayed next to the page title in the browser tab.

How To Add a Favicon in HTML

You can use any image you like as your favicon. You can also create your own favicon on sites like <https://www.favicon.cc>.

A favicon image is displayed to the left of the page title in the browser tab, like this:



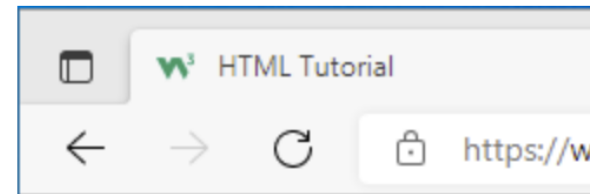


HTML Favicon

```
<!DOCTYPE html>
<html>
<head>
  <title>My Page Title</title>
  <link rel="icon" type="image/x-
icon" href="/images/favicon.ico">
</head>
<body>

<h1>This is a Heading</h1>
<p>This is a paragraph.</p>

</body>
</html>
```



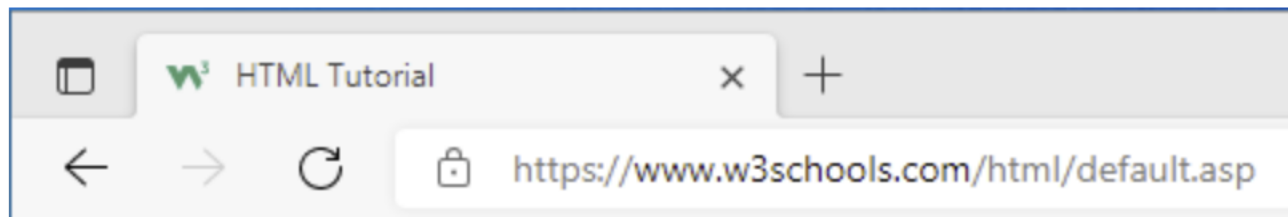


HTML Page Title

Every web page should have a page title to describe the meaning of the page.
The <title> element adds a title to your page:

Example

```
<!DOCTYPE html>  
<html>  
<head>  
  <title>HTML Tutorial</title>  
</head>
```





HTML Javascript

JavaScript makes HTML pages more dynamic and interactive.
The HTML `<script>` Tag

The HTML `<script>` tag is used to define a client-side script (JavaScript).

The `<script>` element either contains script statements, or it points to an external script file through the `src` attribute.
Common uses for JavaScript are image manipulation, form validation, and dynamic changes of content.



HTML JavaScript

To select an HTML element, JavaScript most often uses the `document.getElementById()` method.

This JavaScript example writes "Hello JavaScript!" into an HTML element with `id="demo"`:

Example

```
<script>  
document.getElementById("demo").innerHTML = "Hello  
JavaScript!";  
</script>
```



Writing Valid XHTML

- Check your code for syntax errors
 - Benefit:
 - Valid code →
more consistent browser display
- W3C HTML Validation Tool
 - <http://validator.w3.org>

XHTML

XHTML is a stricter, more XML-based version of HTML.

What is XHTML?

- XHTML stands for **EX**tensible **H**yper**T**ext **M**arkup **L**anguage
- XHTML is a stricter, more XML-based version of HTML
- XHTML is HTML defined as an XML application
- XHTML is supported by all major browsers

XHTML

- XML is a markup language where all documents must be marked up correctly (be "well-formed").
- XHTML was developed to make HTML more extensible and flexible to work with other data formats (such as XML). In addition, browsers ignore errors in HTML pages, and try to display the website even if it has some errors in the markup. So XHTML comes with a much stricter error handling.



The Most Important Differences from HTML

- `<!DOCTYPE>` is **mandatory**
- The `xmlns` attribute in `<html>` is **mandatory**
- `<html>`, `<head>`, `<title>`, and `<body>` are **mandatory**
- Elements must always be **properly nested**
- Elements must always be **closed**
- Elements must always be in **lowercase**
- Attribute names must always be in **lowercase**
- Attribute values must always be **quoted**
- Attribute minimization is **forbidden**



DOCTYPE

```
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.1//EN"
"http://www.w3.org/TR/xhtml11/DTD/xhtml11.dtd">
<html xmlns="http://www.w3.org/1999/xhtml">
<head>
  <title>Title of document</title>
</head>
<body>

  some content here...

</body>
</html>
```



XHTML Elements Must be Properly Nested

In XHTML, elements must always be properly nested within each other, like this:

Correct:

```
<b><i>Some text</i></b>
```

Wrong:

```
<b><i>Some text</b></i>
```



XHTML Elements Must Always be Closed

In XHTML, elements must always be closed, like this:

Correct:

```
<p>This is a paragraph</p>  
<p>This is another paragraph</p>
```

Wrong:

```
<p>This is a paragraph  
<p>This is another paragraph
```



XHTML Empty Elements Must Always be Closed

In XHTML, empty elements must always be closed, like this:

Correct:

A break: `<br />`

A horizontal rule: `<hr />`

An image: ``

Wrong:

A break: `<br>`

A horizontal rule: `<hr>`

An image: ``



XHTML Elements Must be in Lowercase

In XHTML, element names must always be in lowercase, like this:

Correct:

```
<body>  
<p>This is a paragraph</p>  
</body>
```

Wrong:

```
<BODY>  
<P>This is a paragraph</P>  
</BODY>
```



XHTML Attribute Names Must be in Lowercase

In XHTML, attribute names must always be in lowercase, like this:

Correct:

```
<a href="https://www.w3schools.com/html/">Visit our  
HTML tutorial</a>
```

Wrong:

```
<a HREF="https://www.w3schools.com/html/">Visit our  
HTML tutorial</a>
```



XHTML Attribute Values Must be Quoted

In XHTML, attribute values must always be quoted, like this:

Correct:

```
<a href="https://www.w3schools.com/html/">Visit our HTML  
tutorial</a>
```

Wrong:

```
<a href=https://www.w3schools.com/html/>Visit our HTML  
tutorial</a>
```

XHTML

XHTML Attribute Minimization is Forbidden

In XHTML, attribute minimization is forbidden:

Correct:

```
<input type="checkbox" name="vehicle" value="car" checked="checked" />  
<input type="text" name="lastname" disabled="disabled" />
```

Wrong:

```
<input type="checkbox" name="vehicle" value="car" checked />  
<input type="text" name="lastname" disabled />
```



Validate HTML With The W3C Validator

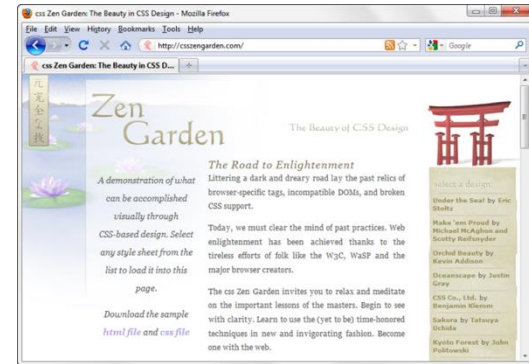
Put your web address in the box below:

https://www.w3schools.com/html/html_validate.html



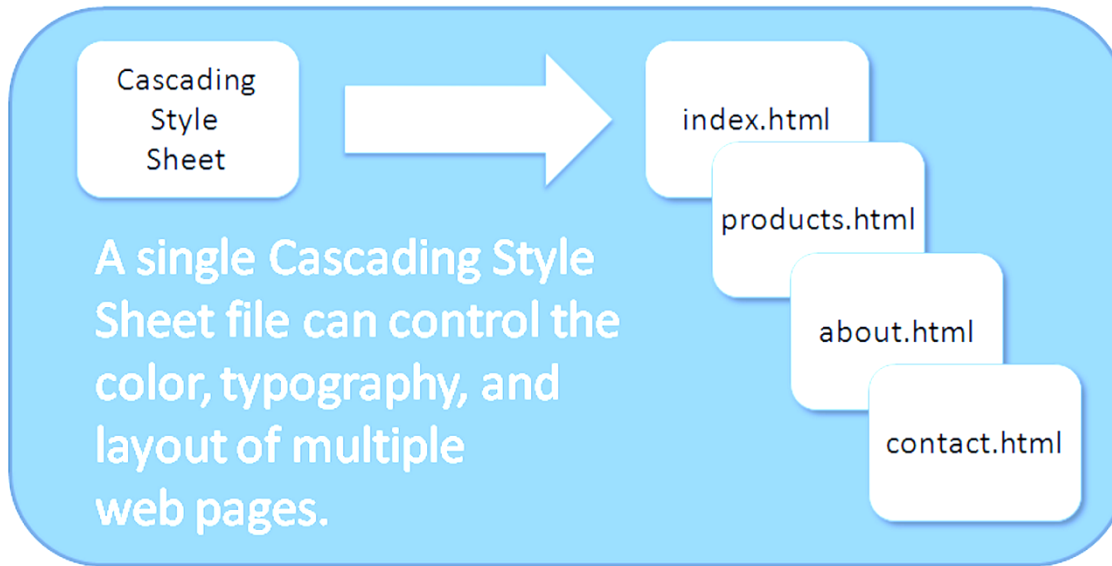
Cascading Style Sheets (CSS)

- ▶ See what is possible with CSS:
 - ▶ Visit <http://www.csszengarden.com>
- ▶ Style Sheets
 - ▶ used for years in Desktop Publishing
 - ▶ apply typographical styles and spacing to printed media
- ▶ CSS
 - ▶ provides the functionality of style sheets (*and much more*) for web developers
 - ▶ a flexible, cross-platform, standards-based language developed by the W3C.





CSS Advantages



- Greater typography and page layout control
- Style is separate from structure
- Styles can be stored in a separate document and associated with the web page
- Potentially smaller documents
- Easier site maintenance



Types of Cascading Style Sheets (CSS)

- Inline Styles
- Embedded Styles
- External Styles
- Imported Styles



Cascading Style Sheets

- **Inline Styles**
 - body section
 - HTML style attribute
 - apply only to the specific element
- **Embedded Styles**
 - head section
 - HTML style element
 - apply to the entire web page document
- **External Styles**
 - Separate text file with .css file extension
 - Associate with a HTML link element in the head section of a web page
- **Imported Styles**
 - Similar to External Styles
 - We'll concentrate on the other three types of styles.



CSS Syntax

- Style sheets are composed of "Rules" that describe the styling to be applied.
- Each Rule contains a Selector and a Declaration





CSS Syntax Sample

Configure a web page to display blue text and yellow background.

```
body { color: blue;  
        background-color: yellow; }
```

This could also be written using hexadecimal color values as shown below.

```
body { color: #0000FF;  
        background-color: #FFFF00; }
```





Common Formatting CSS Properties

- See Table 3.1 Common CSS Properties, including:
 - background-color
 - color
 - font-family
 - font-size
 - font-style
 - font-weight
 - line-height
 - margin
 - text-align
 - text-decoration
 - width



Using Color on Web Pages



Red: #FF0000



Green: #00FF00



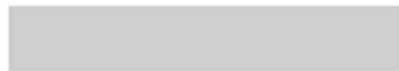
Blue: #0000FF



Black: #000000



White: #FFFFFF



Grey: #CCCCCC

- Computer monitors display color as intensities of red, green, and blue light
- RGB Color
- The values of red, green, and blue vary from 0 to 255.
- Hexadecimal numbers (base 16) represent these color values.



Verify Sufficient Contrast

- When you choose colors for text and background, sufficient contrast is needed so that the text is easy to read.
- Use one of the following online tools to verify contrast:
 - <http://webaim.org/resources/contrastchecker/>
 - http://snook.ca/technical/colour_contrast/colour.html
 - <http://juicystudio.com/services/luminositycontrastratio.php>

CSS Embedded (Internal) Styles

- Configured in the header section of a web page.
- Use the HTML <style> element
- Apply to the entire web page document
- Style declarations are contained between the opening and closing <style> tags
- Example: Configure a web page with white text on a black background

```
<style>
body { background-color: #000000;
      color: #FFFFFF;
}
</style>
```

CSS Embedded Styles



- The body selector sets the global style rules for the entire page.
- These global rules are overridden for <h1> and <h2> elements by the h1 and h2 style rules.

```
<style>
body { background-color: #E6E6FA;
      color: #191970;}
h1 { background-color: #191970;
     color: #E6E6FA;}
h2 { background-color: #AEAED4;
     color: #191970;}
</style>
```



Configuring Text with CSS

- CSS properties for configuring text:
 - font-weight
 - Configures the boldness of text
 - font-style
 - Configures text to an italic style
 - font-size
 - Configures the size of the text
 - font-family
 - Configures the font typeface of the text



The font-size Property

Accessibility Recommendation: Use em or percentage font sizes
– these can be easily enlarged in all browsers by users

Text Values	Em Units	Px Units	Pt Units	Percentage
xx-small	.5 em	8 px	6 pt	50%
x-small	.60 em	11 px	8 pt	60%
small	.75 em	13 px	10 pt	75%
medium	1 em	16 px	12 pt	100%
large	1.15 em	18 px	13.5 pt	110%
x-large	1.5 em	24 px	18 pt	150%
xx-large	2 em	30 px	24 pt	200%



The font-family Property

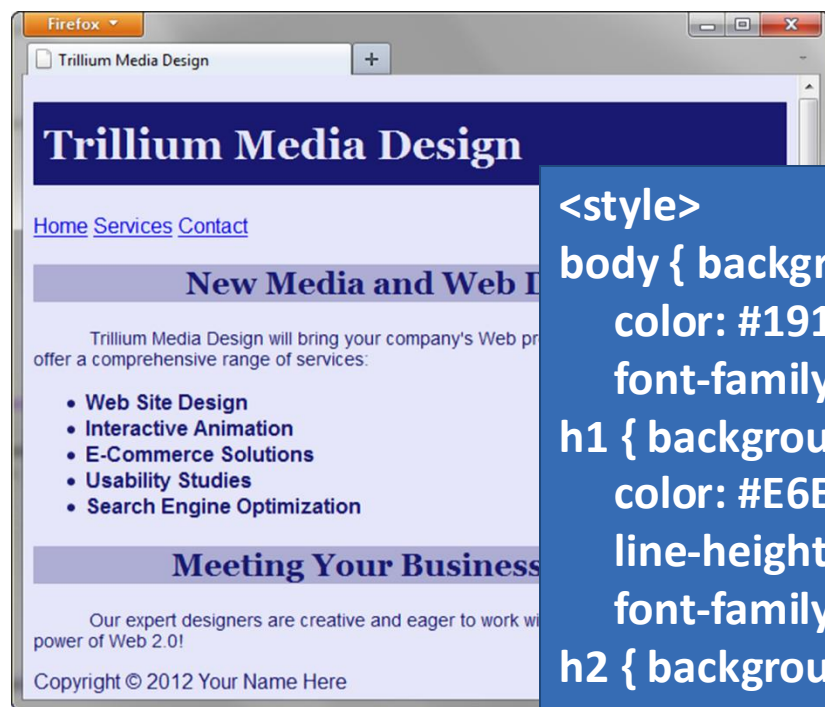
Font-family Category	Font Typeface
serif	Times New Roman, Georgia, Times
sans-serif	Arial, Verdana, Geneva
monospace	Courier New, Lucida Console
cursive	<i>Brush Script MT, Comic Sans MS</i>
fantasy	<i>Jokerman, Curlz MT</i>

- Not everyone has the same fonts installed in their computer
- Configure a list of fonts and include a generic family name

p { font-family: Arial, Verdana, sans-serif; }



Embedded Styles Example



```
<style>
body { background-color: #E6E6FA;
color: #191970;
font-family: Arial, Verdana, sans-serif; }
h1 { background-color: #191970;
color: #E6E6FA;
line-height: 200%;
font-family: Georgia, "Times New Roman", serif; }
h2 { background-color: #AEAED4;
color: #191970; text-align: center;
font-family: Georgia, "Times New Roman", serif; }
p {font-size: .90em; text-indent: 3em; }
ul {font-weight: bold; }
</style>
```



More CSS TEXT Properties

- ▶ **line-height**
 - ▶ Configures the height of the line of text (use the value 200% to appear double-spaced)
- ▶ **text-align**
 - ▶ Configures alignment of text within a block display element
- ▶ **text-indent**
 - ▶ Configures the indentation of the first line of text
- ▶ **text-decoration**
 - ▶ Modifies the appearance of text with an underline, overline, or line-through
- ▶ **text-transform**
 - ▶ Configures the capitalization of text
- ▶ **text-shadow**
 - ▶ Configures a drop shadow on text



CSS Selectors

CSS style rules can be configured for an:

- HTML element selector
- class selector
- id selector
- descendant selector

Using CSS with “class”

- class Selector
 - Apply a CSS rule to a certain "class" of elements on a web page
 - Does not associate the style to a specific HTML element
- Configure with .classname
 - code CSS to create a class called “new” with red italic text.
- Apply the class:

```
<style>
.new { color: #FF0000;
      font-style: italic;
      }
</style>
```

<p class=“new”>This is text is red and in italics</p>

This is text is red and in italics



Using CSS with “id”

- id Selector
 - Apply a CSS rule to ONE element on a web page.
- Configure with #idname
 - Code CSS to create an id called “new” with red, large, italic text.
- Apply the id:

```
<style>  
#new { color: #FF0000;  
        font-size:2em;  
        font-style: italic;  
      }  
</style>
```

<p id=“new”>This is text is red, large, and in italics</p>

This is text is red, large, and in italics



External Style Sheets - 1

- CSS style rules are contained in a text file separate from the HTML documents.
- The External Style Sheet text file:
 - extension ".css"
 - contains only style rules
 - does not contain any HTML tags

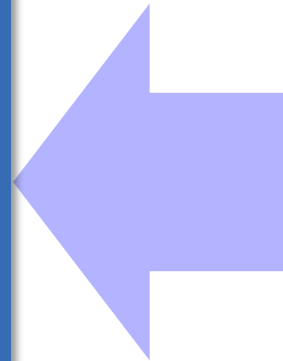


External Style Sheets - 2

- Multiple web pages can associate with the same external style sheet file.

site.css

```
body {background-color:#E6E6FA;  
      color:#000000;  
      font-family:Arial, sans-serif;  
      font-size:90%; }  
h2 { color: #003366; }  
.nav { font-size: 16px;  
      font-weight: bold; }
```



index.html

clients.html

about.html

Etc...



Link Element

- A self-contained tag
- Placed in the header section
- Purpose: associates the external style sheet file with the web page.
- Example:

```
<link rel="stylesheet" href="color.css">
```



Using an External Style Sheet

External Style Sheet color.css

```
body { background-color: #0000FF;  
      color: #FFFFFF;  
}
```

To associate the external style sheet called color.css, the HTML code placed in the head section is:

```
<link rel="stylesheet" href="color.css">
```



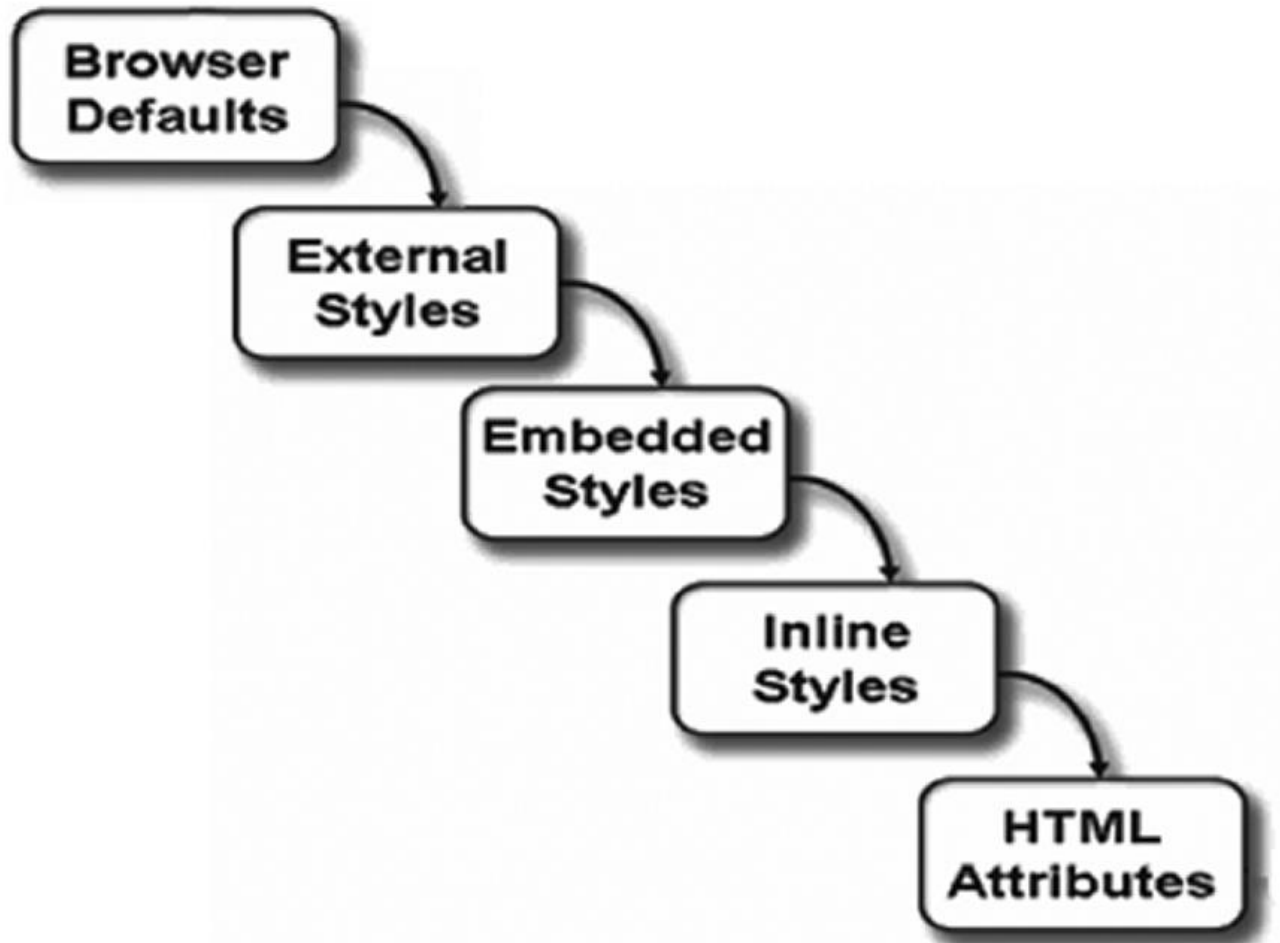
Centering Page Content with CSS

```
#container { margin-left: auto;
              margin-right: auto;
              width:80%; }
```





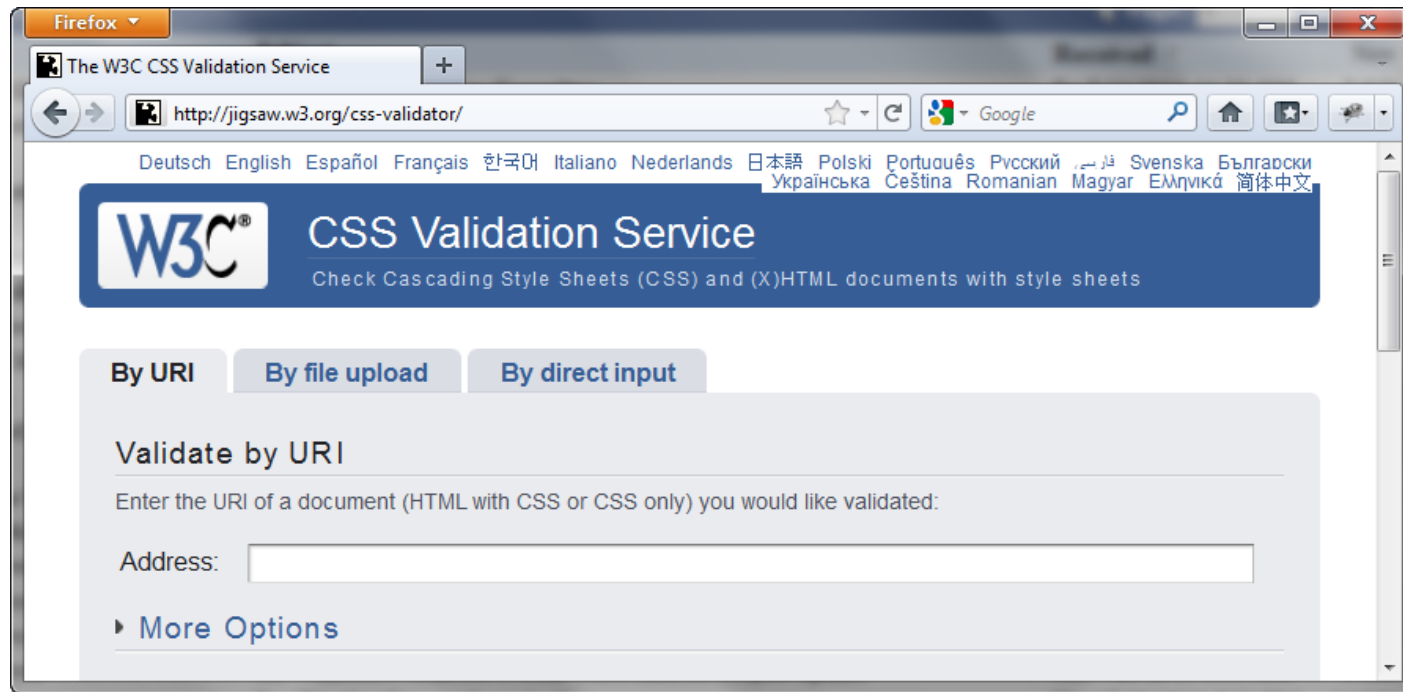
The “Cascade”





W3C CSS Validation

- <http://jigsaw.w3.org/css-validator/>





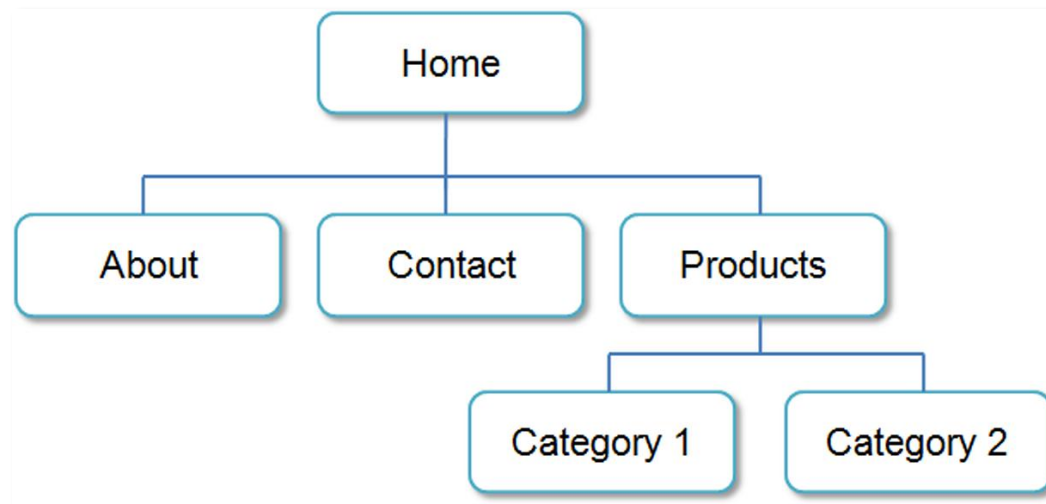
WebSite Organization

- Hierarchical
- Linear
- Random
(sometimes called Web Organization)



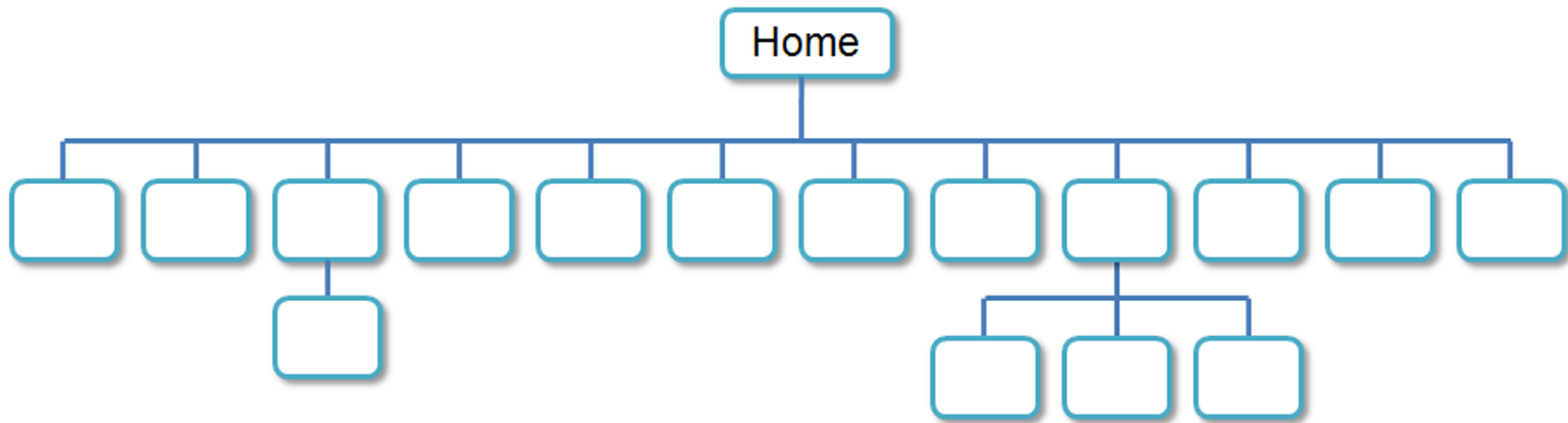
Hierarchical Organization

- A clearly defined home page
- Navigation links to major site sections
- Often used for commercial and corporate websites





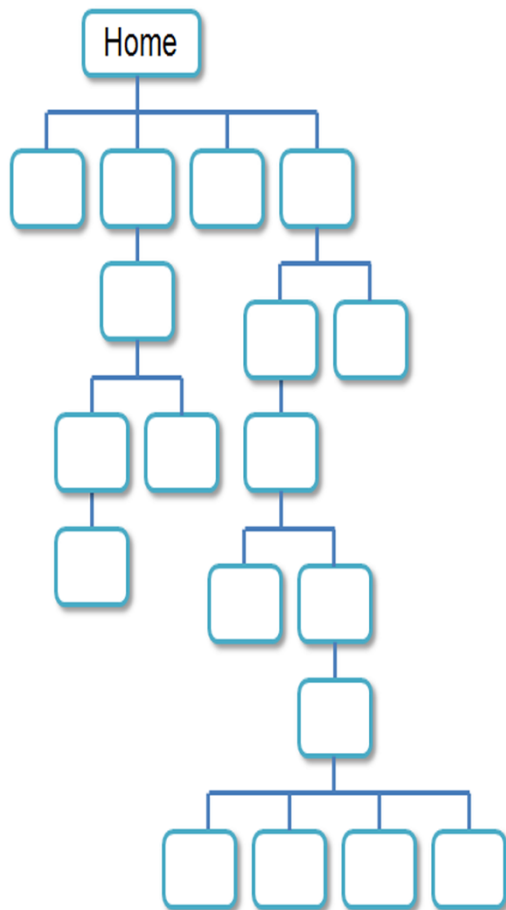
Hierarchical & Shallow



- ▶ Be careful that the organization is not too shallow.
 - ▶ Too many choices → a confusing and less usable web site
 - ▶ Information Chunking
 - ▶ Research by Nelson Cowan: adults typically can keep about four items or chunks of items in short-term memory (<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2864034/>)
- ▶ Be aware of the number of major navigation links
- ▶ Try group navigation links visually into groups with no more than about four links.



Hierarchical & Deep



- Be careful that the organization is not too deep.
 - This results in many “clicks” needed to drill down to the needed page.
 - User Interface “Three Click Rule”
 - A web page visitor should be able to get from any page on your site to any other page on your site with a maximum of three hyperlinks.



Linear Organization

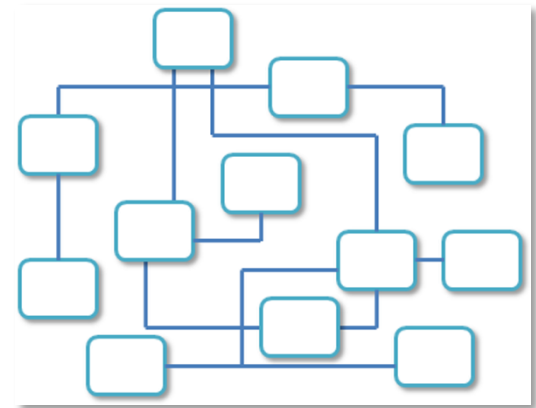


- A series of pages that provide a tutorial, tour, or presentation.
- Sequential viewing



Random Organization

- Sometimes called “Web” Organization
- Usually there is no clear path through the site
- May be used with artistic or concept sites
- Not typically used for commercial sites.





JAVASCRIPT

- JavaScript is a scripting language most often used for client-side web development.
- JavaScript is an implementation of the ECMAScript standard.
- The ECMAScript only defines the syntax/characteristics of the language and a basic set of commonly used objects such as Number, Date, Regular Expression, etc.
- The JavaScript supported in the browsers typically support additional objects.
- e.g., Window, Frame, Form, DOM object, etc.



JAVASCRIPT

JavaScript / JScript

- Different brands or/and different versions of browsers may support different implementation of JavaScript.
- They are not fully compatible
JScript is the Microsoft version of JavaScript.



JAVASCRIPT

What can we do with JavaScript?

- To create interactive user interface in a web page (e.g., menu, pop-up alert, windows, etc.)
- Manipulating web content dynamically Change the content and style of an element
- Replace images on a page without page reload
Hide/Show contents
- Generate HTML contents on the fly Form validation
AJAX (e.g. Google complete)
etc.



JAVASCRIPT

Useful Resources and Interesting Examples

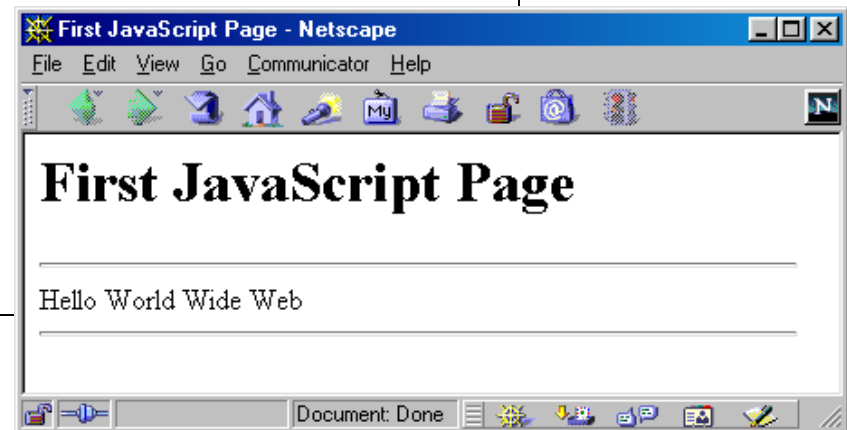
- JavaScript Tutorials <http://www.w3schools.com/>
- Some examples from W3Schools
 - JavaScript Examples
 - JavaScript Object Examples
 - JavaScript HTML DOM Examples
- JavaScript DHTML GUI Components
 - <http://www.java2s.com/Code/JavaScript/GUI-Components/CatalogGUI-Components.htm>
- EditGrid
 - <http://www.editgrid.com/>



JAVASCRIPT

A Simple Script

```
<html>
<head><title>First JavaScript
Page</title></head>
<body>
<h1>First JavaScript Page</h1>
<script type="text/javascript">
    document.write("<hr>");
    document.write("Hello World Wide
Web"); document.write("<hr>");
</script>
</body>
</html>
```





JAVASCRIPT

Embedding Script

```
<html>
<head><title>First JavaScript Program</title></head>
<body>
<script type="text/javascript"
    src="your_source_file.js"></script>
</body>
</html>
```

Inside your source file.js

```
document.write("<hr>");
document.write("Hell World Wide Web");
document.write("<hr>");
```

- Use the **src** attribute to include JavaScript codes from an external file.
- The included code is inserted in place.



JAVASCRIPT

Hiding JavaScript from Incompatible Browsers

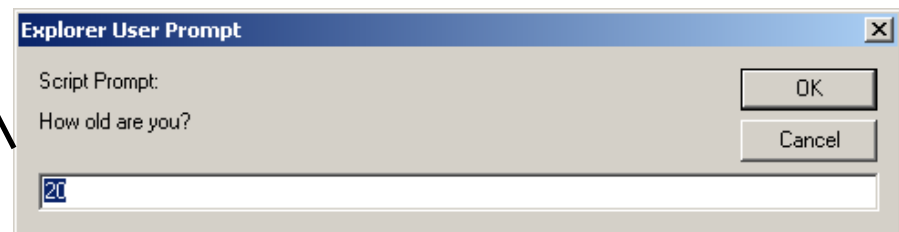
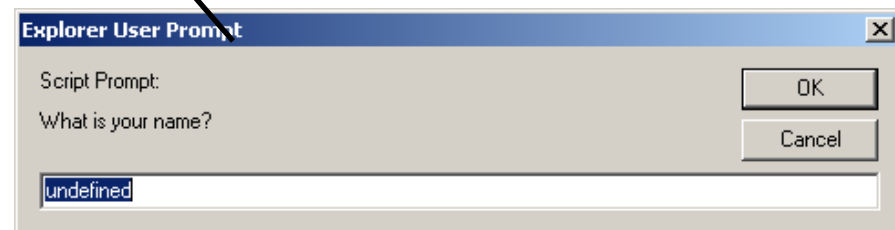
```
<script type="text/javascript">  
<!--  
    document.writeln("Hello, WWW");  
// -->  
</script>  
<noscript>  
    Your browser does not support JavaScript.  
</noscript>
```



JAVASCRIPT

alert(), confirm(), and prompt()

```
<script type="text/javascript">
alert("This is an Alert method");
confirm("Are you OK?");
prompt("What is your name?");
prompt("How old are you?", "20");
</script>
```





JAVASCRIPT

Identifier

- Same as Java/C++ except that it allows an additional character – '\$'.
- Contains only 'A' – 'Z', 'a' – 'z', '0' – '9', '_', '\$'
- First character cannot be a digit
- Case-sensitive
- Cannot be reserved words or keywords



JAVASCRIPT

Data Types

- Primitive data types
 - Number: integer & floating-point numbers
 - Boolean: true or false
 - String: a sequence of alphanumeric characters
- Composite data types (or Complex data types)
 - Object: a named collection of data
 - Array: a sequence of values (an array is actually a predefined object)
- Special data types
 - Null: the only value is "null" – to represent nothing.
 - Undefined: the only value is "undefined" – to represent the value of an uninitialized variable



JAVASCRIPT

Build-In JavaScript Objects

Object	Description
Array	Creates new array objects
Boolean	Creates new Boolean objects
Date	Retrieves and manipulates dates and times
Error	Returns run-time error information
Function	Creates new function objects
Math	Contains methods and properties for performing mathematical calculations
Number	Contains methods and properties for manipulating numbers.
String	Contains methods and properties for manipulating text strings

- See online references for complete list of available methods in these objects:

<http://javascript-reference.info/>



Lebanese University
Faculty of Information

Brunch I

Dr. Mohamad **Nagi**

PhD in Data Mining - Computer Science

Thank you for Listening