

Internet & Web Technology (CS 504)

Assignment 2 Solutions

1 Basic Structure of an HTML Document

An HTML document is the skeleton of any webpage. It uses a specific, nested structure to tell the browser what content to display and how to organize it. The fundamental structure is built around four primary tags:

Tag	Purpose
<!DOCTYPE html>	The declaration . This tells the browser the document is modern HTML5.
<html>	The root element . All other elements are nested inside this tag.
<head>	The brain . Contains metadata: information <i>about</i> the page that isn't displayed directly (title, CSS links, etc.).
<body>	The body . Contains all the visible content: headings, paragraphs, images, etc.

Diagram of the Structure

[Diagram placeholder: A set of nested boxes showing html -> head/body]

```
1 <!DOCTYPE html>
2 <html>
3   <head>
4     <title>My First Webpage</title>
5   </head>
6   <body>
7     <h1>Hello, World!</h1>
8     <p>This is the skeleton of a webpage.</p>
9   </body>
10 </html>
```

Advantages of HTML

- **Universally Supported:** Every web browser can read and interpret HTML.
- **Easy to Learn:** The syntax is simple and forgiving.
- **Foundation of the Web:** It integrates seamlessly with CSS and JavaScript.
- **Semantic Structure:** Modern HTML5 provides tags that give meaning to content, improving SEO and accessibility.

The Quirk

Browsers are ridiculously **forgiving**. You can make mistakes like forgetting to close tags, and most browsers will still try their best to render the page. This is a blessing for beginners but a curse for professionals because it can hide errors and lead to unpredictable behavior.

2 Text Formatting Tags in HTML

HTML provides a rich set of tags for formatting text, from high-level structure to inline styling.

Tag	Name	Purpose & Example
<h1>-<h6>	Headings	Defines hierarchical headings. <h1>Main Title</h1>
<p>	Paragraph	Defines a paragraph. <p>Sample paragraph.</p>
	Strong	Semantically marks text as important. Rendered as bold . Warning!
	Bold	Visually makes text bold without adding importance. bold text
	Emphasis	Semantically emphasizes text. Rendered as <i>italic</i> . You must see this.
<i>	Italic	Visually makes text italic. A <i>priori</i>.
<u>	Underline	Underlines text. Can be confused with links. <u>Underlined</u>
<s>	Strikethrough	Puts a line through text. <s>Old Price: \$50</s>
<sub>	Subscript	Renders text as a subscript. H₂O
<sup>	Superscript	Renders text as a superscript. E=mc²
 	Line Break	Inserts a single line break. First line. Second line.

The Quirk

The difference between vs. and <i> vs. is semantic. Use and when you want to tell search engines and screen readers that the text has special importance. Use and <i> when you just want to change the visual style.

3 Difference Between HTML and ASP

This compares a client-side markup language (HTML) to a server-side technology (ASP.NET).

Feature	HTML (HyperText Markup Language)	ASP.NET (Active Server Pages)
Purpose	To structure and display content in a web browser.	A framework to generate dynamic content on a server.
Execution	Client-Side. The browser reads and renders the HTML file directly.	Server-Side. The web server executes code to produce plain HTML, which is then sent to the client's browser.
File Extension	.html or .htm	.aspx
Nature	Static. The content does not change unless the file is manually edited.	Dynamic. The content can change based on user input, database queries, etc.
Database	Cannot directly interact with a database.	Can connect to databases (like SQL Server) to fetch or update data.

The Quirk

A user's web browser **never sees a single line of ASP.NET code**. It only receives the final product: plain HTML. The server-side code is like a secret recipe used in the kitchen (the server); the customer (the browser) only ever gets the finished cake (the HTML page).

4 Frames and Layers in HTML

This question covers some obsolete and modern concepts for layout.

Frames (<frameset>, <frame>)

Originally, frames were used to split a browser window into multiple panes, each loading a different HTML file. **This technology is obsolete in HTML5.**

```
1 <frameset cols="25%, 75%">
2   <frame src="navigation.html">
3   <frame src="content.html">
4 </frameset>
```

They were replaced because of major issues with SEO, bookmarking, and usability.

Layers (Modern CSS)

The term "layers" today refers to stacking elements using CSS position and z-index properties.

```
1 .box1 {
2   position: absolute;
3   background-color: red;
4   z-index: 1; /* Sits behind */
5 }
6 .box2 {
7   position: absolute;
8   background-color: blue;
9   z-index: 2; /* Sits on top */
10 }
```

The Quirk

The question itself is a historical artifact. The real answer is not just *how* frames worked, but *why* we stopped using them. Recognizing obsolete technology is a key skill. The modern successor is the <iframe> tag for embedding content, combined with CSS for layout.

5 Internal Linking in HTML

Internal linking (or **anchor links**) creates a hyperlink that jumps to a specific section on the *same page*. It's a two-step process:

1. **Create the Destination:** Give a unique id attribute to the element you want to jump to.
2. **Create the Link:** Create an anchor tag <a> where the href attribute starts with a # followed by the destination id.

```
1 <p>Read more in our <a href="#section2">Conclusion Section</a>.</p>
2
3 <h2 id="section2">Conclusion Section</h2>
4 <p>This is the section the link will jump down to.</p>
```

The Quirk

You can make the jump buttery smooth instead of jarringly instant with a single line of CSS, which vastly improves the user experience. Just add this to your stylesheet: `html { scroll-behavior: smooth; }`

6 Attributes of the <form> Tag

The <form> tag's attributes define how and where user-submitted data is sent.

Attribute	Description
action	Specifies the URL where the form data should be sent for processing.
method	Specifies the HTTP method to use. Common values are <code>GET</code> and <code>POST</code> .
enctype	Specifies the encoding type . Use <code>multipart/form-data</code> for file uploads.
target	Specifies where to display the response after submission (e.g., <code>_self</code> , <code>_blank</code>).
novalidate	A boolean attribute that, if present, disables the browser's default form validation.
autocomplete	Specifies whether the browser should be allowed to auto-complete fields. Can be set to <code>on</code> or <code>off</code> .

The Quirk

GET vs. POST: The `method` attribute is critical.

- **GET:** Appends form data to the URL. Use for non-sensitive data like search queries. Data is visible and length-limited.
- **POST:** Sends form data in the HTTP request body. Use for sensitive data like passwords. Data is hidden from the URL.

Never send passwords with `GET`!

7 Common Lists in HTML

HTML provides three main types of lists for structuring related items.

List Type	Tags	Purpose & Use Case
Unordered List	<code></code> , <code></code>	For items where order does not matter . Rendered with bullets. Perfect for navigation menus.
Ordered List	<code></code> , <code></code>	For items where order is important . Rendered with numbers. Perfect for step-by-step instructions.
Description List	<code><dl></code> , <code><dt></code> , <code><dd></code>	For a list of key-value pairs . Perfect for glossaries or dictionaries.

The Quirk

Lists are more than just bullet points. In modern web design, the `` is the semantic and standard way to build **navigation menus**. The links (`<a>`) are placed inside the list items (``), and CSS is used to style them (e.g., remove bullets and display horizontally).

8 The Use of the <iframe> Tag

An <iframe> (Inline Frame) is used to **embed a completely separate web document** within the current page.

Common Uses

- Embedding videos from YouTube or Vimeo.
- Embedding interactive maps from Google Maps.
- Embedding third-party widgets like social media feeds or payment forms.

Key Attributes

Attribute	Description
src	The URL of the page to embed. This is the most important attribute.
width / height	Sets the dimensions of the frame.
frameborder	Specifies whether to display a border around the frame. 0 is common for no border.
allowfullscreen	Boolean attribute that allows the iframe content to go full screen.
sandbox	Imposes security restrictions on the iframe content to prevent malicious behavior.

The Quirk

While powerful, <iframe>s can negatively impact your page's performance (it has to load a whole other webpage) and can pose security risks like "clickjacking". The **sandbox** attribute is a modern security feature designed to mitigate these risks by limiting what the embedded content is allowed to do.

9 The Layout of HTML (Semantic Layout)

Modern HTML5 introduced a set of semantic layout elements that give meaning to the structure of a page, replacing the old practice of using generic <div> tags for everything.

[Diagram placeholder: A typical webpage layout showing header, nav, main (with article/section), aside, and footer.]

Element	Purpose
<header>	The introductory content for a page or section (logo, title, search bar).
<nav>	Contains the primary navigation links for the site.
<main>	Represents the main, unique content of the page. Should only be one per page.
<article>	A self-contained piece of content that could stand on its own (e.g., a blog post).
<section>	A thematic grouping of content, typically with its own heading.
<aside>	Contains content tangentially related to the main content, like a sidebar.
<footer>	The footer for a page or section (copyright info, contact details).

The Quirk

Using these semantic tags provides two huge "invisible" benefits:

1. **Accessibility:** Screen readers can understand the page structure, allowing users to jump directly to the navigation or main content.
2. **SEO:** Search engines can better understand the context and importance of your content, which can lead to better rankings.

10 Common Lists in HTML (Duplicate)

This question is identical to question 7. Please see the detailed answer in section §7 on page 5.