

HTML Advanced

Learning Objective

Introduction

HTML (Hypertext Markup Language) has several advanced concepts that can enhance your web development skills and allow you to create more sophisticated and interactive web pages.

Focus: HTML Forms, Tables, Lists, and iframe

Prerequisites: VS Code IDE and HTML Basics

Theme

Medium is a popular online publishing platform that incorporates various HTML advanced concepts to provide an interactive and user-friendly reading experience. The medium allows users to sign up, log in, and interact with the platform through forms. They use HTML form elements such as input fields, checkboxes, and buttons to collect user information and enable actions like submitting an article or leaving comments.

They also utilize HTML lists to structure and present content. They use ordered lists (``) and unordered lists (``) to display numbered and bulleted lists, respectively. This helps in presenting information in an organized and readable manner.

The medium may incorporate HTML tables to present tabular data or layout information in a structured format. Tables can be used for presenting data, such as statistics or comparisons, or for organizing content in a grid-like structure.

They may also use iframes to embed external content within their articles. For example, they might embed videos from platforms like YouTube or display interactive elements from other websites. The use of iframes allows Medium to incorporate rich media and interactive features seamlessly into their articles.

Primary Goals

- Understand the fundamentals of HTML forms and their various input elements.
- Learn how to structure and present tabular data using HTML tables.

- Gain knowledge about creating ordered, unordered and definition lists in HTML.
- Understand the concept of iframes and how to embed external content within a webpage.
- Able to apply your knowledge effectively during the project implementation steps.

HTML Advanced

Forms in HTML

HTML forms are an essential part of web development as they allow users to input and submit data. HTML provides a set of elements and attributes to create forms. Here's a detailed explanation of HTML forms and their components:

1. **<form> element:** The `<form>` element is used to create a form. It acts as a container for various form controls. It has two important attributes:
 - **action:** Specify the URL or endpoint where the form data should be sent upon submission.
 - **method:** Specify the HTTP method to be used when submitting the form, either "get" or "post."
2. Here's an example of how the `<form>` tag is used:

```
<form action="/submit_form" method="post">
  <!-- form controls go here -->
</form>
```

In the upcoming sections of this course, we will explore this type in more detail.

2. **Form controls:** Form controls are elements that allow users to input and select data. Here are some commonly used form controls:
 - **<input>:** Creates an input field for various types of data, such as text, email, password, checkboxes, radio buttons, etc.
 - **Name:** The name field allows users to input their names. It is typically a single-line text input (`<input type="text">`).

- **Email:** The email field is used for collecting email addresses. It ensures that the entered value follows a valid email format (`<input type="email">`).
- **Mobile:** The mobile field is used to collect users' phone numbers. It can accept numeric input and may include additional validation or formatting requirements (`<input type="tel">`).
- **Radio Button:** Radio buttons are used when users need to choose one option from a list. They provide a set of mutually exclusive options, and only one option can be selected at a time (`<input type="radio">`).
- **Checkbox:** Checkboxes allow users to select one or more options from a set of choices. Each checkbox is independent of the others, and multiple options can be selected simultaneously (`<input type="checkbox">`).
- **Text area:** The text area allows users to input multiple lines of text. It is useful for collecting longer messages, comments, or descriptions (`<textarea></textarea>`).
- **File Upload:** The file upload field enables users to select and upload files from their local device to the server. It typically displays a "Browse" or "Choose File" button (`<input type="file">`).
- **Submit Button:** The submit button triggers the form submission process. When clicked, it sends the form data to the server for processing (`<input type="submit">` or `<button type="submit"></button>`).

2. Here's an example of how different `<form>` elements are used:

```
<input type="text" name="username" id="username">
<textarea name="message" id="message" rows="4"></textarea>
```

```
<button type="submit">Submit</button>
```

Important attributes of Form control:

- **name attribute:** The `name` attribute is used to identify form controls when the form is submitted. It serves as the key for the corresponding input value.
 - Example:

```
<input type="text" name="username">
```

- **label element:** The `<label>` element provides a text label for form controls. It improves accessibility and usability by associating the label with its corresponding control.
 - Example:

```
<label for="username">Username:</label>  
<input type="text" name="username" id="username">
```

- **required attribute:** The `required` attribute makes a form control mandatory, ensuring the user provides a value before submitting the form.
 - Example:

```
<input type="text" name="username" required>
```

These are the fundamental components of HTML forms. You can enhance forms by implementing form validation, styling, and utilizing JavaScript for client-side interactivity.

Project Implementation Step 1:



Reserve

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Name:

Email:

Mobile Number:

Gender: ☐ Male ☐ Female ☐ Prefer not to say

Message:

Upload Image: no file selected

Subscribe to Newsletter: ☐

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Tables in HTML

HTML tables can be used to present the bus schedules, including departure times, arrival times, and other details. Each row of the table represents a different bus trip, and each column represents a specific attribute, such as the bus number, origin, destination, departure time, and duration.

Attributes that can be applied include:

- `<table>`: Used to define a table in a web page. It serves as a container for other table-related elements such as `<caption>`, `<thead>`, `<tbody>`, and `<tfoot>`. It allows you to organize data into rows and columns.

- Example:

```
<table>
  <!-- Table content goes here -->
</table>
```

- `<caption>`: Used to provide a caption or title for the table. It is typically placed inside the `<table>` element and appears above or below the table, depending on the styling.

- Example:

```
<table>
  <caption>This is a table caption</caption>
  <!-- Table content goes here -->
</table>
```

- `<thead>`: Used to group the header content of a table. It is usually placed inside the `<table>` element and contains one or more `<tr>` elements that define table rows.

- Example:

```
<table>
  <thead>
    <!-- Table header content goes here -->
  </thead>
  <tbody>
    <!-- Table body content goes here -->
  </tbody>
</table>
```

- `<tr>`: Used to define a table row. It is typically placed inside the `<tbody>`, `<thead>`, or `<tfoot>` element and contains one or more `<td>` or `<th>` elements that define table cells.

- Example:

```
<table>
  <tbody>
    <tr>
      <!-- Table body content goes here -->
    </tr>
  </tbody>
</table>
```

- `<th>`: Used to define table header cells. It is similar to `<td>`, but it is specifically used for headers. It is typically placed inside `<thead>` and `<tr>` elements.

- Example:

```
<table>
  <thead>
    <tr>
      <th>Header 1</th>
      <th>Header 2</th>
    </tr>
  </thead>
  <tbody>
    <!-- Table content goes here -->
  </tbody>
</table>
```

- `scope`: Used with `<th>` elements to specify whether a header is associated with a row (`scope="row"`) or a column (`scope="col"`). It helps in providing semantic information about the header and improves accessibility for screen readers.

- Example:

```
<table>
  <thead>
    <tr>
      <th scope="col">Column Header</th>
      <th scope="row">Row Header</th>
    </tr>
  </thead>
  <tbody>
    <!-- Table content goes here -->
  </tbody>
</table>
```

```
</tbody>
</table>
```

- **<tbody>**: Used to group the body content of a table. It is typically placed inside the **<table>** element and contains one or more **<tr>** elements that define table rows.
 - Example:

```
<table>
  <thead>
    <!-- Table header content goes here -->
  </thead>
  <tbody>
    <!-- Table body content goes here -->
  </tbody>
</table>
```

- **<td>**: Represents a table cell. It is used to define individual cells within a table row. It can contain text, images, links, or other HTML elements.
 - Example:

```
<table>
  <tbody>
    <tr>
      <td>Cell 1</td>
      <td>Cell 2</td>
    </tr>
  </tbody>
</table>
```

- **colspan** & **rowspan**: Used with **<td>** and **<th>** elements to specify the number of columns or rows a cell should span. **colspan** is used to make a cell span multiple columns, and **rowspan** is used to make a cell span multiple rows.
 - Example:

```
<table>
  <tr>
    <td colspan="2">This cell spans two columns</td>
    <td rowspan="2">This cell spans two rows</td>
  </tr>
  <tr>
    <td>Cell 1</td>
    <td>Cell 2</td>
  </tr>
```

</table>

Practical Implementation Step 2:



Reserve

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Reserve Bus Schedule

Bus Details		Trip Information		
Bus Number	Origin	Destination	Departure Time	Duration
ASC712	New York City	Boston	09:00 AM	2 hours
XYZ789	San Francisco	Los Angeles	11:30 AM	3 hours
DEF456	Miami	Orlando	10:45 AM	4 hours
GHI789	Chicago	St. Louis	08:15 AM	5 hours
JKL012	Seattle	Portland	09:30 AM	3.5 hours
MNO345	Denver	Las Vegas	12:00 PM	6 hours
RVC109	Atlanta	Nashville	10:00 AM	4.5 hours
STU901	Houston	San Antonio	11:15 AM	2.5 hours

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Lists in HTML

1. Ordered Lists (): An ordered list is used when you want to display a list of items in a specific order or sequence. Each item in the list is represented by an (list item) element.
 - The `type` attribute of the element in HTML allows you to specify the numbering style for an ordered list. If the `type` attribute is not specified in the element in HTML, the default numbering style will be used, which is decimal numbers (`type="1"`).
 - Here are the possible values for the `type` attribute:`type="1"`: This is the default value and represents decimal numbers (1, 2, 3...).
 - `type="A"`: Uppercase Latin letters (A, B, C...).
 - `type="a"`: Lowercase Latin letters (a, b, c...).
 - `type="I"`: Uppercase Roman numerals (I, II, III...).
 - `type="i"`: Lowercase Roman numerals (i, ii, iii...).

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- `type="1"` with `start="x"`: Starts the numbering at a specific number. Replace `x` with the desired starting number.
- `type="A"` with `start="x"`: Starts the uppercase lettering at a specific letter. Replace `x` with the desired starting letter.
- `type="a"` with `start="x"`: Starts the lowercase lettering at a specific letter. Replace `x` with the desired starting letter.

2. These options provide flexibility in choosing the numbering or lettering style for your ordered lists.

Example:

```
<!-- When type of ordered list is not specified -->
<ol>
  <li>Item 1</li>
  <li>Item 2</li>
  <li>Item 3</li>
</ol>
```

```
<!-- When type of ordered list is specified -->
<ol type="I">
  <li>First item</li>
  <li>Second item</li>
  <li>Third item</li>
</ol>
```

2. Unordered Lists (``): An unordered list is used when the order of the items is not important. Each item in the list is represented by an `` element, and the items are typically displayed with bullet points.

1. Example:

```
<ul>
  <li>Item 1</li>
  <li>Item 2</li>
  <li>Item 3</li>
</ul>
```

3. Definition Lists (`<dl>`): A definition list is used to present a list of terms and their corresponding definitions. It consists of `<dt>` (definition term) elements, which represent the terms, and `<dd>` (definition description) elements, which represent the definitions.

- `<dfn>`: In HTML lists, the `<dfn>` element is used to define and highlight the definition or the term being defined within a list. It stands for "definition" and is typically used within `` elements in a definition list (`<dl>`).

2. Example:

```
<!-- Without using dfn element -->
<dl>
  <dt>First Term</dt>
  <dd>Description...</dd>
  <dt>Second Term</dt>
  <dd>Description...</dd>
</dl>
```

```
<!-- With dfn element -->
<dl>
  <dt><dfn>First Term</dfn></dt>
  <dd>Description...</dd>
  <dt><dfn>Second Term</dfn></dt>
  <dd>Description...</dd>
</dl>
```

- ## 4. Nested Lists: HTML allows you to nest lists within other lists to create hierarchical structures. This means you can have lists inside `` elements.

1. Example:

```
<ul>
  <li>Route 1
    <ul>
      <li>Item 1</li>
      <li>Item 2</li>
    </ul>
  </li>
  <li>Route 2
    <ul>
      <li>Item 1</li>
      <li>Item 2</li>
    </ul>
  </li>
</ul>
```

Practical Implementation Step 3:



Reserve

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A step-by-step booking process

1. Select origin and destination
2. Choose date and time
3. Enter passenger details
4. Confirm booking

Benefits of booking through Reserve App

- Comfortable seating
- Reliable service
- Competitive prices
 - Discounts for regular customers
- Friendly customer support

Type of Bus services

Standard Bus:

Regular seating with air conditioning

Deluxe Bus:

Comfortable seating, extra legroom, and Wi-Fi

Executive Bus:

Luxurious leather seats, personal entertainment systems, and complimentary meals

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Summary

What did we learn?

- The `<form>` element is used to create a form and has attributes like `action` and `method`. Form controls allow users to input and select data.
- Commonly used form controls include `<input>`, `<textarea>`, `<select>`, and `<button>`.
- Each form control has attributes like `name`, `label`, and `required` for identification, labeling, and making fields mandatory.
- HTML tables are used to present data in rows and columns.
- Key elements for tables are `<table>`, `<caption>`, `<thead>`, `<tbody>`, `<tfoot>`, `<tr>`, `<th>`, and `<td>`.

- Attributes like `scope`, `colspan`, and `rowspan` are used for semantic information and spanning cells.
- Ordered lists (``) are used to display items in a specific order or sequence, whereas Unordered lists (``) are used when item order is not important. Items are typically displayed with bullet points.
- Definition lists (`<dl>`) are used for presenting terms and their definitions. They consist of `<dt>` and `<dd>` elements. `<dfn>` can be used to highlight definitions.
- Nested lists allow the creation of hierarchical structures by placing lists inside `` elements.

Shortcomings & Challenges

- One of the challenges with forms, tables, and lists is ensuring accessibility for users with disabilities.
- Validating user input and providing appropriate error messages can be challenging.
- Forms, tables, and lists may not automatically adapt well to different screen sizes and devices. Designing responsive layouts that properly display and maintain usability on various screen sizes can be a challenge.
- Protecting sensitive user information, preventing cross-site scripting (XSS) attacks, and properly sanitizing user input are essential challenges to address.

Best practices to follow

- Use semantic HTML elements and attributes to provide clear and meaningful structure to your forms, tables, and lists. This improves accessibility and search engine optimization (SEO), and facilitates better understanding by both humans and machines.
- Apply security measures such as input validation, sanitization, and proper handling of user input to prevent security vulnerabilities like XSS attacks. Implement encryption and security protocols when handling sensitive data.

- Thoroughly test your forms, tables, and lists across different browsers, devices, and screen sizes. Gather feedback from users to identify any usability issues or areas for improvement.

Enhance your knowledge

Supercharge your knowledge by exploring the resources provided! 

- Multimedia in HTML:
<https://www.codewithrandom.com/2022/12/10/how-to-add-multimedia-to-html/>
- More advanced HTML features:
<https://www.w3.org/MarkUp/Guide/Advanced.html>