HTML LECTURE PDF

HTML (HyperText Markup Language)

1. Introduction to HTML

HTML stands for HyperText Markup Language. It is the standard markup language for creating web pages and web applications. HTML structures the content of a webpage using a series of elements and tags.

Key Features:

- Simple and easy to learn.
- Platform-independent.
- Allows embedding multimedia (images, audio, video).
- Supports linking between web pages.

Basic Structure of an HTML Document:

```
<!DOCTYPE html>
<html lang="en">
<head>
    <title>My First Page</title>
</head>
<body>
    <h1>Welcome to HTML</h1>
    <p>This is a basic HTML page.</p>
</body>
</html>
```

---

2. HTML5 New Features

- Native support for audio and video.
- Local storage (using `local Storage`, `session Storage`).
- Enhanced form controls (date, email, etc.).

Example (HTML5 Input Type):

```
<input type="email" required>
```

---

3. HTML Attributes

Provides additional information about HTML elements.

Common Attributes:

- `id`: Unique element identifier.
- `class`: Defines element class.
- `style`: Inline CSS styling.

Example:

```
<p id="para1" class="text">Styled paragraph.</p>
```

---

4. HTML Document Structure

- `<!DOCTYPE html>`: Declares the HTML version (HTML5).
- `<html>`: Root element of the HTML page.
- `<head>`: Contains metadata (title, charset, etc.).
- `<title>`: Defines the page title (displayed in the browser tab).
- `<body>`: Contains the content visible to the use

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5. HTML Metadata

Metadata is information about the document.

Example (Meta Tag):

```
<head>
    <meta charset="UTF-8">
    <meta name="description" content="HTML tutorial">
</head>
```

---

6. HTML Entities

Represents reserved or special characters.

Example (Entity Usage):

```
<p>This is an ampersand: &amp;amp;</p>
```

---

7. HTML Semantic Elements

Improves document clarity using meaningful tags like `<header>`, `<footer>`, `<article>`.

Example:

```
<header>
```

```
    <h1>Website Header</h1>
</header>
<article>
    <p>Article content here.</p>
</article>
```

---

8. HTML Comments

Comments are ignored by browsers.

Example (Comment Syntax):

```
<!-- This is a comment -->
```

---

9. HTML Elements and Tags

HTML is composed of elements enclosed in tags.

Example of an HTML Element:

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

Types of Elements:

- Block-level: Takes full width (e.g., `<div>`, `<p>`, `<h1>`).
- Inline: Takes space as per content (e.g., `<span>`, `<a>`).

---

10. HTML Headings

Used to define headings from `<h1>` (largest) to `<h6>` (smallest).

Example:

```
<h1>Main Heading</h1>
<h2>Subheading</h2>
```

---

11. HTML Paragraphs

Defines blocks of text using the `<p>` tag.

Example:

```
<p>This is a paragraph of text.</p>
```

---

12. HTML Links

Used to create hyperlinks with the `<a>` tag.

Example:

```
<a href="https://www.example.com">Visit Example</a>
```

Attributes:

- `href`: Specifies the URL.
- `target`: Defines where to open the link (`_blank`, `_self`, etc.).

---

13. HTML Images

The `<img>` tag embeds images.

Example:

```
<img src="image.jpg" alt="Description">
```

Attributes:

- `src`: Image source URL.
- `alt`: Alternative text (for accessibility).

---

14. HTML Lists

- **Ordered Lists** (`<ol>`) – Numbered.

  Ex-

```
<ol>
  <li>Item 1</li>
  <li>Item 2</li>
</ol>
```

- **Unordered Lists** (`<ul>`) – Bulleted.

Ex-
```
<ul>
    <li>Item 1</li>
    <li>Item 2</li>
</ul>
```

- **Definition List** (`<dl>`)
  Ex-

```
<dl>
    <dt>HTML</dt>
    <dd>Hyper Text Markup Language</dd>
  </dl>
```

---

15. HTML Audio

Ex-

```
<audio controls>
  <source src="audio.mp3" type="audio/mpeg">
</audio>
```

---

16. HTML Video

Ex-

```
<video controls width="300">
  <source src="video.mp4" type="video/mp4">
</video>
```

---

17. HTML Iframes

Embeds another webpage.

Example (Iframe):

```
<iframe src="https://www.example.com" width="600" height="400"></iframe>
```

---

18. HTML Forms

Collects user input with `<form>` and form controls.

Example:

```
<form action="submit.php" method="post">
    <label for="name">Name:</label>
    <input type="text" id="name" name="name">
    <button type="submit">Submit</button>
</form>
```

HTML Forms – Detailed Explanation

1. What is an HTML Form?

An HTML form is used to collect user input and send it to a server for processing. It consists of various form elements like text fields, radio buttons, checkboxes, drop-down lists, and buttons.

2. Basic Structure of an HTML Form

```
<form action="submit.php" method="POST">
    <label for="name">Name:</label>
    <input type="text" id="name" name="name">
    <input type="submit" value="Submit">
</form>
```

- The `<form>` tag defines an HTML form.
- The `action` attribute specifies where to send the form data (server file).
- The `method` attribute defines how the data is sent (`GET` or `POST`).

---

3. HTML Form Elements and Their Uses

A. Input Fields

The `<input>` tag is used to create various types of input fields.

1 Text Input Field

Used for entering text like names, emails, etc.

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

2 Password Field

Used for entering a password (hides characters).

```
<label for="password">Password:</label>
<input type="password" id="password" name="password">
```

3 Email Field

Used for email addresses with built-in validation.

```
<label for="email">Email:</label>
<input type="email" id="email" name="email">
```

4 Number Field

Only allows numeric values.

```
<label for="age">Age:</label>
```

```
<input type="number" id="age" name="age" min="1" max="100">
```

5 Date Field

Used to select a date.

```
<label for="dob">Date of Birth:</label>
<input type="date" id="dob" name="dob">
```

6 Telephone Field

Used for phone numbers.

```
<label for="phone">Phone Number:</label>
<input type="tel" id="phone" name="phone">
```

B. Radio Buttons

Used when only one option can be selected.

```
<p>Gender:</p>
<input type="radio" id="male" name="gender" value="male">
<label for="male">Male</label>

<input type="radio" id="female" name="gender" value="female">
<label for="female">Female</label>
```

- **Note:** All radio buttons should have the same `name` so only one can be selected.

C. Checkboxes

Used when multiple selections are allowed.

```
<p>Select your hobbies:</p>
<input type="checkbox" id="sports" name="hobby" value="sports">
<label for="sports">Sports</label>

<input type="checkbox" id="music" name="hobby" value="music">
<label for="music">Music</label>

<input type="checkbox" id="reading" name="hobby" value="reading">
<label for="reading">Reading</label>
```

D. Dropdown (Select)

Used for selecting one option from a list.

```
<label for="country">Select your country:</label>
<select id="country" name="country">
    <option value="india">India</option>
    <option value="usa">USA</option>
    <option value="uk">UK</option>
</select>
```

E. Textarea (Multiline Text Box)

Used for writing long text like comments or addresses.

```
<label for="message">Your Message:</label>
<textarea id="message" name="message" rows="4" cols="50"></textarea>
```

F. File Upload

Allows users to upload files.

```
<label for="file">Upload File:</label>
<input type="file" id="file" name="file">
```

G. Submit and Reset Buttons

Submit Button (Sends the form data)

```
<input type="submit" value="Submit">
```

Reset Button (Clears all input fields)

```
<input type="reset" value="Reset">
```

---

4. Form Validation Attributes

These attributes help validate input fields.

Attribute	Description
`Required`	Makes the field mandatory
`minlength`	Minimum number of characters
`maxlength`	Maximum number of characters
`pattern`	Defines a regex pattern for validation
`readonly`	Field cannot be edited
`disabled`	Field is disabled

Example:

```
<input type="text" name="username" required minlength="3" maxlength="15"
pattern="[A-Za-z]+" title="Only letters allowed">
```

---

5. GET vs. POST Method

Method	Description
GET	Data is visible in the URL. Used for non-sensitive data.
POST	Data is sent securely in the request body. Used for sensitive data.

Example:

```
<form action="submit.php" method="POST">
```

---

6. Complete HTML Form Example

```
<!DOCTYPE html>
<html>
<head>
    <title>HTML Form Example</title>
</head>
<body>
    <h2>Registration Form</h2>
    <form action="submit.php" method="POST">
        <label for="name">Full Name:</label>
        <input type="text" id="name" name="name" required><br><br>

        <label for="email">Email:</label>
        <input type="email" id="email" name="email" required><br><br>

        <label for="password">Password:</label>
        <input type="password" id="password" name="password"
required><br><br>

        <label for="gender">Gender:</label>
        <input type="radio" id="male" name="gender" value="male"> Male
        <input type="radio" id="female" name="gender" value="female">
Female<br><br>

        <label for="hobby">Hobbies:</label>
        <input type="checkbox" id="sports" name="hobby" value="sports">
Sports
        <input type="checkbox" id="music" name="hobby" value="music"> Music
        <input type="checkbox" id="reading" name="hobby" value="reading">
Reading<br><br>

        <label for="country">Country:</label>
        <select id="country" name="country">
            <option value="india">India</option>
            <option value="usa">USA</option>
            <option value="uk">UK</option>
        </select><br><br>

        <label for="message">Message:</label>
        <textarea id="message" name="message" rows="4"
cols="50"></textarea><br><br>

        <label for="file">Upload File:</label>
        <input type="file" id="file" name="file"><br><br>

        <input type="submit" value="Register">
        <input type="reset" value="Clear">
    </form>
</body>
</html>
```

---

19. HTML Tables

Displays tabular data using `<table>`, `<tr>`, `<td>`, and `<th>`.

Example:

```
<table border="1">
    <tr>
        <th>Name</th>
        <th>Age</th>
    </tr>
    <tr>
        <td>John</td>
        <td>30</td>
    </tr>
</table>
```

HTML Tables – Detailed Explanation

1. What is an HTML Table?

An HTML table is used to organize and display data in rows and columns. It consists of table elements such as `<table>`, `<tr>` (table row), `<th>` (table header), and `<td>` (table data).

Basic Structure of an HTML Table

```
<table border="1">
    <tr>
        <th>Heading 1</th>
        <th>Heading 2</th>
    </tr>
    <tr>
        <td>Data 1</td>
        <td>Data 2</td>
    </tr>
</table>
```

- `<table>`: Defines the table.
- `<tr>`: Defines a table row.
- `<th>`: Defines a table header (bold and centered by default).
- `<td>`: Defines a table data cell.

---

2. Table Elements & Attributes

A. `<table>` - Table Container

The `<table>` tag is the main container for table data.

B. `<tr>` - Table Row

Each row in a table is defined using the `<tr>` tag.

C. `<th>` - Table Header

Headers are displayed in bold and center-aligned by default.

```
<th>Header Name</th>
```

D. `<td>` - Table Data Cell

Each `<td>` represents a data cell in a table.

```
<td>Table Data</td>
```

E. `border` Attribute

Adds a border around the table.

```
<table border="1">
```

---

3. Advanced Table Features

A. Table with Multiple Rows & Columns

```
<table border="1">
    <tr>
        <th>Name</th>
        <th>Age</th>
        <th>City</th>
    </tr>
    <tr>
        <td>John</td>
        <td>25</td>
        <td>New York</td>
    </tr>
    <tr>
        <td>Alice</td>
        <td>30</td>
        <td>Los Angeles</td>
    </tr>
</table>
```

B. Table with `colspan` and `rowspan`

1 `colspan` (Merge Columns)

```
<table border="1">
    <tr>
        <th colspan="2">Full Name</th>
    </tr>
    <tr>
        <td>John</td>
        <td>Doe</td>
    </tr>
</table>
```

- The `colspan="2"` merges two columns into one.

2 `rowspan` (Merge Rows)

```
<table border="1">
    <tr>
        <th>Name</th>
        <td rowspan="2">John</td>
    </tr>
    <tr>
```

```
        <th>Age</th>
    </tr>
</table>
```

- The `rowspan="2"` merges two rows into one.

---

4. Table Styling with CSS

We can style tables using CSS for better presentation.

A. Add Background Color and Borders

```
<style>
    table {
        width: 50%;
        border-collapse: collapse;
    }
    th, td {
        border: 1px solid black;
        padding: 10px;
        text-align: center;
    }
    th {
        background-color: lightgray;
    }
</style>
```

---

5. Table with Caption

A caption provides a title for the table.

```
<table border="1">
    <caption>Student Information</caption>
    <tr>
        <th>Name</th>
        <th>Grade</th>
    </tr>
    <tr>
        <td>Emma</td>
        <td>A</td>
    </tr>
</table>
```

---

6. Table with Nested Table (Table inside Table)

```
<table border="1">
    <tr>
        <th>Name</th>
        <th>Details</th>
    </tr>
    <tr>
        <td>John</td>
        <td>
            <table border="1">
                <tr>
                    <th>Age</th>
```

```
                    <td>25</td>
                </tr>
                <tr>
                    <th>City</th>
                    <td>New York</td>
                </tr>
            </table>
        </td>
    </tr>
</table>
```

---

7. Responsive Tables

To make tables responsive on smaller screens:

```
<style>
    table {
        width: 100%;
        border-collapse: collapse;
    }
    @media screen and (max-width: 600px) {
        table {
            display: block;
            overflow-x: auto;
            white-space: nowrap;
        }
    }
</style>
```

---

8. Complete Table Example

```
<!DOCTYPE html>
<html>
<head>
    <title>Student Table</title>
    <style>
        table {
            width: 70%;
            border-collapse: collapse;
            margin: 20px 0;
            font-size: 18px;
            text-align: left;
        }
        th, td {
            border: 1px solid black;
            padding: 10px;
        }
        th {
            background-color: #f2f2f2;
        }
    </style>
</head>
<body>
    <h2>Student Details</h2>
    <table>
        <tr>
            <th>Name</th>
            <th>Age</th>
            <th>Grade</th>
        </tr>
        <tr>
```

```
            <td>John</td>
            <td>25</td>
            <td>A</td>
        </tr>
        <tr>
            <td>Emma</td>
            <td>22</td>
            <td>B</td>
        </tr>
    </table>
</body>
</html>
```

---

20. HTML Best Practices

- Use semantic elements for better SEO.
- Validate code using W3C validator.
- Optimize images for fast loading.
