



Unit 2 - Web Page Designing

Content Web Page Designing: HTML: List, Table, Images, Frames, forms, CSS, Document type definition, XML: DTD, XML schemes, Object Models, presenting and using XML, Using XML Processors: DOM and SAX, Dynamic HTML.

OUTCOME of this unit- should equip learners with the skills and knowledge necessary to design and develop sophisticated web pages and applications using HTML, CSS, and XML technologies while adhering to web standards and best practices.

What is HTML

HTML is an acronym which stands for **Hyper Text Markup Language** which is used for creating web pages and web applications. Let's see what is meant by Hypertext Markup Language, and Web page.

Hyper Text: HyperText simply means "Text within Text." A text has a link within it, is a hypertext. Whenever you click on a link which brings you to a new webpage, you have clicked on a hypertext. HyperText is a way to link two or more web pages (HTML documents) with each other.

Markup language: A markup language is a computer language that is used to apply layout and formatting conventions to a text document. Markup language makes text more interactive and dynamic. It can turn text into images, tables, links, etc.

Web Page: A web page is a document which is commonly written in HTML and translated by a web browser. A web page can be identified by entering an URL. A Web page can be of the static or dynamic type. **With the help of HTML only, we can create static web pages.**

Hence, HTML is a markup language which is used for creating attractive web pages with the help of styling, and which looks in a nice format on a web browser. An HTML document is made of many HTML tags and each HTML tag contains different content.

Let's see a simple example of HTML.

```
<!DOCTYPE>
```

```
<html>
```



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```
<head>
<title>Web page title</title>
</head>
<body>
<h1>Write Your First Heading</h1>
<p>Write Your First Paragraph.</p>
</body>
</html>
```

Description of HTML Example

<!DOCTYPE>: It defines the document type or it instruct the browser about the version of HTML.

<html > :This tag informs the browser that it is an HTML document. Text between html tag describes the web document. It is a container for all other elements of HTML except <!DOCTYPE>

<head>: It should be the first element inside the <html> element, which contains the metadata(information about the document). It must be closed before the body tag opens.

<title>: As its name suggested, it is used to add title of that HTML page which appears at the top of the browser window. It must be placed inside the head tag and should close immediately. (Optional)

<body> : Text between body tag describes the body content of the page that is visible to the end user. This tag contains the main content of the HTML document.

<h1 > : Text between <h1> tag describes the first level heading of the webpage.

<p> : Text between <p> tag describes the paragraph of the webpage.



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Brief History of HTML

In the late 1980's , a physicist, Tim Berners-Lee who was a contractor at CERN, proposed a system for CERN researchers. In 1989, he wrote a memo proposing an internet based hypertext system.

Tim Berners-Lee is known as the father of HTML. The first available description of HTML was a document called "HTML Tags" proposed by Tim in late 1991. The latest version of HTML is HTML5, which we will learn later in this tutorial.

HTML Versions

Since the time HTML was invented there are lots of HTML versions in market, the brief introduction about the HTML version is given below:

HTML 1.0: The first version of HTML was 1.0, which was the barebones version of HTML language, and it was released in 1991.

HTML 2.0: This was the next version which was released in 1995, and it was standard language version for website design. HTML 2.0 was able to support extra features such as form-based file upload, form elements such as text box, option button, etc.

HTML 3.2: HTML 3.2 version was published by W3C in early 1997. This version was capable of creating tables and providing support for extra options for form elements. It can also support a web page with complex mathematical equations. It became an official standard for any browser till January 1997. Today it is practically supported by most of the browsers.

HTML 4.01: HTML 4.01 version was released on December 1999, and it is a very stable version of HTML language. This version is the current official standard, and it provides added support for stylesheets (CSS) and scripting ability for various multimedia elements.

HTML5 : HTML5 is the newest version of HyperText Markup language. The first draft of this version was announced in January 2008. There are two major organizations one is W3C (World Wide Web Consortium), and another one is WHATWG(Web Hypertext Application Technology Working Group) which are involved in the development of HTML 5 version, and still, it is under development.



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Features of HTML

- 1) It is a very **easy and simple language**. It can be easily understood and modified.
- 2) It is very easy to make an **effective presentation** with HTML because it has a lot of formatting tags.
- 3) It is a **markup language**, so it provides a flexible way to design web pages along with the text.
- 4) It facilitates programmers to add a **link** on the web pages (by html anchor tag), so it enhances the interest of browsing of the user.
- 5) It is **platform-independent** because it can be displayed on any platform like Windows, Linux, and Macintosh, etc.
- 6) It facilitates the programmer to add **Graphics, Videos, and Sound** to the web pages which makes it more attractive and interactive.
- 7) HTML is a case-insensitive language, which means we can use tags either in lower-case or upper-case.

HTML Tags

HTML tags are like keywords which defines that how web browser will format and display the content. With the help of tags, a web browser can distinguish between an HTML content and a simple content. HTML tags contain three main parts: opening tag, content and closing tag. But some HTML tags are unclosed tags.

When a web browser reads an HTML document, browser reads it from top to bottom and left to right. HTML tags are used to create HTML documents and render their properties. Each HTML tags have different properties.

An HTML file must have some essential tags so that web browser can differentiate between a simple text and HTML text. You can use as many tags you want as per your code requirement.

All HTML tags must enclosed within < > these brackets.

Every tag in HTML perform different tasks.



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If you have used an open tag `<tag>`, then you must use a close tag `</tag>` (except some tags)

Syntax

`<tag> content </tag>`

HTML Tag Examples

Note: HTML Tags are always written in lowercase letters. The basic HTML tags are given below:

`<p>` Paragraph Tag `</p>`

`<h2>` Heading Tag `</h2>`

`` **Bold Tag** ``

`<i>` *Italic Tag* `</i>`

`<u>` Underline Tag`</u>`

Unclosed HTML Tags

Some HTML tags are not closed, for example `br` and `hr`.

**`
` Tag:** `br` stands for break line, it breaks the line of the code.

`<hr>` Tag: `hr` stands for Horizontal Rule. This tag is used to put a line across the webpage.

HTML Meta Tags

DOCTYPE, title, link, meta and style

HTML Text Tags



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<p>, <h1>, <h2>, <h3>, <h4>, <h5>, <h6>, , , <abbr>, <acronym>, <address>, <bdo>, <blockquote>, <cite>, <q>, <code>, <ins>, , <dfn>, <kbd>, <pre>, <samp>, <var> and

HTML Link Tags

<a> and <base>

HTML Image and Object Tags

, <area>, <map>, <param> and <object>

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HTML List Tags

, , , <dl>, <dt> and <dd>

HTML Table Tags

table, tr, td, th, tbody, thead, tfoot, col, colgroup and caption

HTML Form Tags

form, input, textarea, select, option, optgroup, button, label, fieldset and legend

HTML Scripting Tags

script and noscript

HTML Lists



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HTML Lists are used to specify lists of information. All lists may contain one or more list elements. There are three different types of HTML lists:

Ordered List or Numbered List (ol)

Unordered List or Bulleted List (ul)

Description List or Definition List (dl)

Note: We can create a list inside another list, which will be termed as nested List.

HTML Ordered List or Numbered List

In the ordered HTML lists, all the list items are marked with numbers by default. It is known as numbered list also. The ordered list starts with `` tag and the list items start with `` tag.

```
<ol>
```

```
<li>Aries</li>
```

```
<li>Bingo</li>
```

```
<li>Leo</li>
```

```
<li>Oracle</li>
```

```
</ol>
```

Test it Now

Output:

Aries

Bingo

Leo

Oracle



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HTML Unordered List or Bulleted List

In HTML Unordered list, all the list items are marked with bullets. It is also known as bulleted list also. The Unordered list starts with `` tag and list items start with the `` tag.

```
<ul>
```

```
<li>Aries</li>
```

```
<li>Bingo</li>
```

```
<li>Leo</li>
```

```
<li>Oracle</li>
```

```
</ul>
```

Test it Now

Output:

Aries

Bingo

Leo

Oracle

HTML Table

HTML table tag is used to display data in tabular form (row * column). There can be many columns in a row.

We can create a table to display data in tabular form, using `<table>` element, with the help of `<tr>`, `<td>`, and `<th>` elements.

In Each table, table row is defined by `<tr>` tag, table header is defined by `<th>`, and table data is defined by `<td>` tags.



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HTML tables are used to manage the layout of the page e.g. header section, navigation bar, body content, footer section etc. But it is recommended to use div tag over table to manage the layout of the page .

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HTML Table Tags

Tag	Description
<table>	It defines a table.
<tr>	It defines a row in a table.
<th>	It defines a header cell in a table.
<td>	It defines a cell in a table.
<caption>	It defines the table caption.
<colgroup>	It specifies a group of one or more columns in a table for formatting.
<col>	It is used with <colgroup> element to specify column properties for each column.
<tbody>	It is used to group the body content in a table.
<thead>	It is used to group the header content in a table.
<tfooter>	It is used to group the footer content in a table.



HTML Table with Border

By border attribute of table in HTML

1) HTML Border attribute

You can use border attribute of table tag in HTML to specify border. But it is not recommended now.

```
<table border="1">  
<tr><th>First_Name</th><th>Last_Name</th><th>Marks</th></tr>  
<tr><td>Sonoo</td><td>Jaiswal</td><td>60</td></tr>  
<tr><td>James</td><td>William</td><td>80</td></tr>  
<tr><td>Swati</td><td>Sironi</td><td>82</td></tr>  
<tr><td>Chetna</td><td>Singh</td><td>72</td></tr>  
</table>
```

Test it Now

Output:

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First_Name	Last_Name	Marks
Sonoo	Jaiswal	60
James	William	80
Swati	Sironi	82
Chetna	Singh	72



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HTML Form

An **HTML form** is a section of a document which contains controls such as text fields, password fields, checkboxes, radio buttons, submit button, menus etc.

An HTML form facilitates the user to enter data that is to be sent to the server for processing such as name, email address, password, phone number, etc. .

Why use HTML Form

HTML forms are required if you want to collect some data from of the site visitor.

For example: If a user want to purchase some items on internet, he/she must fill the form such as shipping address and credit/debit card details so that item can be sent to the given address.

HTML Form Syntax

```
<form action="server url" method="get|post">
```

```
//input controls e.g. textfield, textarea, radiobutton, button
```

```
</form>
```

HTML Form Tags

Let's see the list of HTML 5 form tags.

Tag	Description
<form>	It defines an HTML form to enter inputs by the used side.



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<input>	It defines an input control.
<textarea>	It defines a multi-line input control.
<label>	It defines a label for an input element.
<fieldset>	It groups the related element in a form.
<legend>	It defines a caption for a <fieldset> element.
<select>	It defines a drop-down list.
<optgroup>	It defines a group of related options in a drop-down list.
<option>	It defines an option in a drop-down list.
<button>	It defines a clickable button.

HTML 5 Form Tags

Let's see the list of HTML 5 form tags.

Tag	Description
<datalist>	It specifies a list of pre-defined options for input control.
<keygen>	It defines a key-pair generator field for forms.
<output>	It defines the result of a calculation.



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HTML <form> element

The HTML <form> element provide a document section to take input from user. It provides various interactive controls for submitting information to web server such as text field, text area, password field, etc.

Note: The <form> element does not itself create a form but it is container to contain all required form elements, such as <input>, <label>, etc.

Syntax:

```
<form>
```

```
//Form elements
```

```
</form>
```

HTML <input> element

The HTML <input> element is fundamental form element. It is used to create form fields, to take input from user. We can apply different input filed to gather different information form user. Following is the example to show the simple text input.

Example:

```
<body>
```

```
<form>
```

```
Enter your name <br>
```

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

```
</form>
```

```
</body>
```

Output:



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Enter your name

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HTML TextField Control

The type="text" attribute of input tag creates textfield control also known as single line textfield control. The name attribute is optional, but it is required for the server side component such as JSP, ASP, PHP etc.

<form>

First Name: **<input type="text" name="firstname"/>** **
**

Last Name: **<input type="text" name="lastname"/>** **
**

</form>

Output:



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The screenshot shows a web browser window titled "Form in HTML". The address bar displays "file:///D:/HTML/JTP.html". The main content area contains two text input fields. The first field is preceded by the label "First Name:" and the second field is preceded by the label "Last Name:". Both fields are empty and have a light gray border.

HTML `<textarea>` tag in form

The `<textarea>` tag in HTML is used to insert multiple-line text in a form. The size of `<textarea>` can be specify either using "rows" or "cols" attribute or by CSS.

Example:

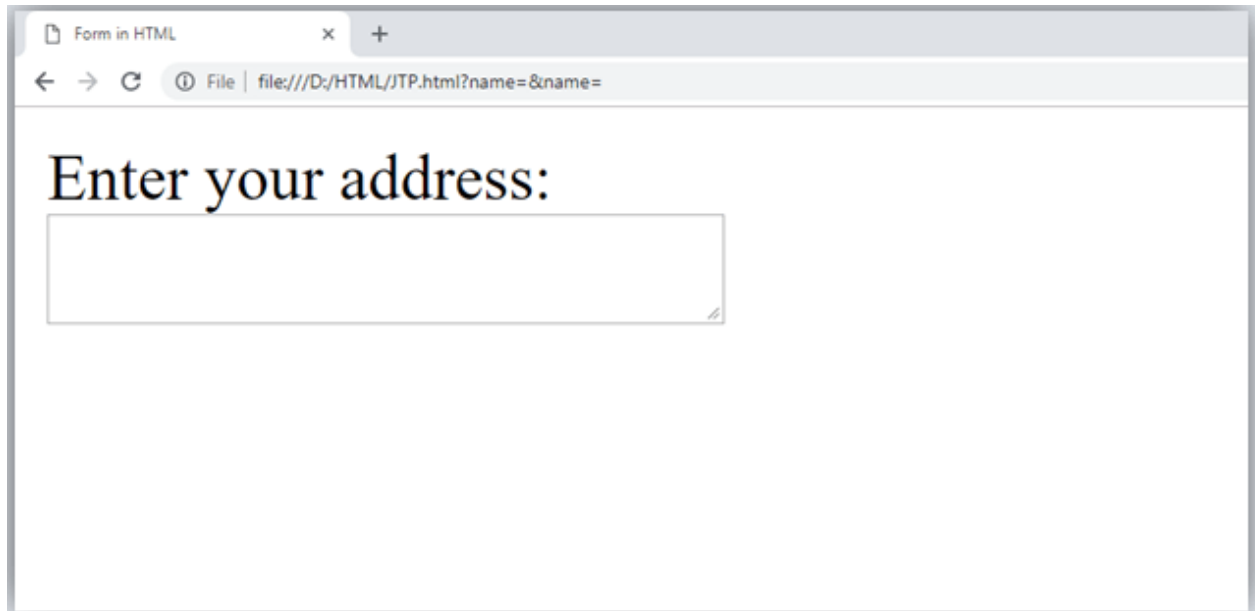
```
<!DOCTYPE html>
<html>
<head>
  <title>Form in HTML</title>
</head>
<body>
  <form>
    Enter your address:<br>
    <textarea rows="2" cols="20"> </textarea>
  </form>
</body>
```



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`</html>`

Output:



Label Tag in Form

It is considered better to have label in form. As it makes the code parser/browser/user friendly.

If you click on the label tag, it will focus on the text control. To do so, you need to have for attribute in label tag that must be same as id attribute of input tag.

NOTE: It is good to use <label> tag with form, although it is optional but if you will use it, then it will provide a focus when you tap or click on label tag. It is more worthy with touchscreens.

`<form>`

```
<label for="firstname">First Name: </label> <br/>
```

```
<input type="text" id="firstname" name="firstname"/> <br/>
```

```
<label for="lastname">Last Name: </label>
```




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```
<input type="text" id="lastname" name="lastname"/> <br/>
```

```
</form>
```

Output:

First Name:

Last Name:

HTML Password Field Control

The password is not visible to the user in password field control.

```
<form>
```

```
<label for="password">Password: </label>
```

```
<input type="password" id="password" name="password"/> <br/>
```

```
</form>
```

Output:



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Password:

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HTML 5 Email Field Control

The email field is new in HTML 5. It validates the text for correct email address. You must use @ and . in this field.

<form>

<label for="email">Email: </label>

**<input type="email" id="email" name="email"/>
**

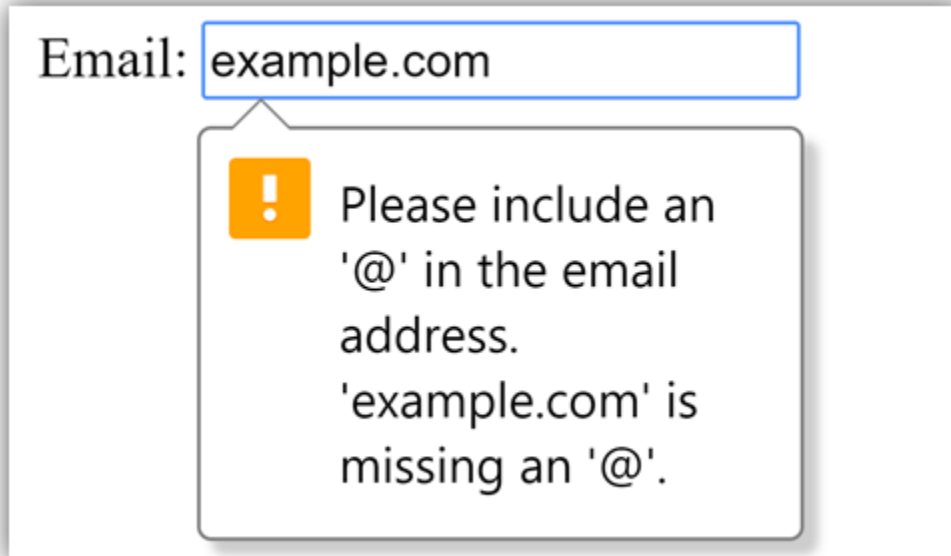
</form>

It will display in browser like below:

Email:

Note: If we will not enter the correct email, it will display error like:

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Radio Button Control

The radio button is used to select one option from multiple options. It is used for selection of gender, quiz questions etc.

If you use one name for all the radio buttons, only one radio button can be selected at a time.

Using radio buttons for multiple options, you can only choose a single option at a time.

<form>

<label for="gender">Gender: **</label>**

<input type="radio" id="gender" name="gender" value="male"/>Male

<input type="radio" id="gender" name="gender" value="female"/>Female **
**

</form>



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Gender: Male Female

Checkbox Control

The checkbox control is used to check multiple options from given checkboxes.

<form>

Hobby:**
**

```
<input type="checkbox" id="cricket" name="cricket" value="cricket"/>
```

```
<label for="cricket">Cricket</label> <br>
```

```
<input type="checkbox" id="football" name="football" value="football"/>
```

```
<label for="football">Football</label> <br>
```

```
<input type="checkbox" id="hockey" name="hockey" value="hockey"/>
```

```
<label for="hockey">Hockey</label>
```

</form>

Note: These are similar to radio button except it can choose multiple options at a time and radio button can select one button at a time, and its display.

Output:



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Hobby:

- Cricket
- Football
- Hockey

Submit button control

HTML `<input type="submit">` are used to add a submit button on web page. When user clicks on submit button, then form get submit to the server.

Syntax:

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

The type = submit , specifying that it is a submit button

The value attribute can be anything which we write on button on web page.

The name attribute can be omit here.

Example:

```
<form>
```

```
  <label for="name">Enter name</label><br>
```

```
  <input type="text" id="name" name="name"><br>
```

```
  <label for="pass">Enter Password</label><br>
```



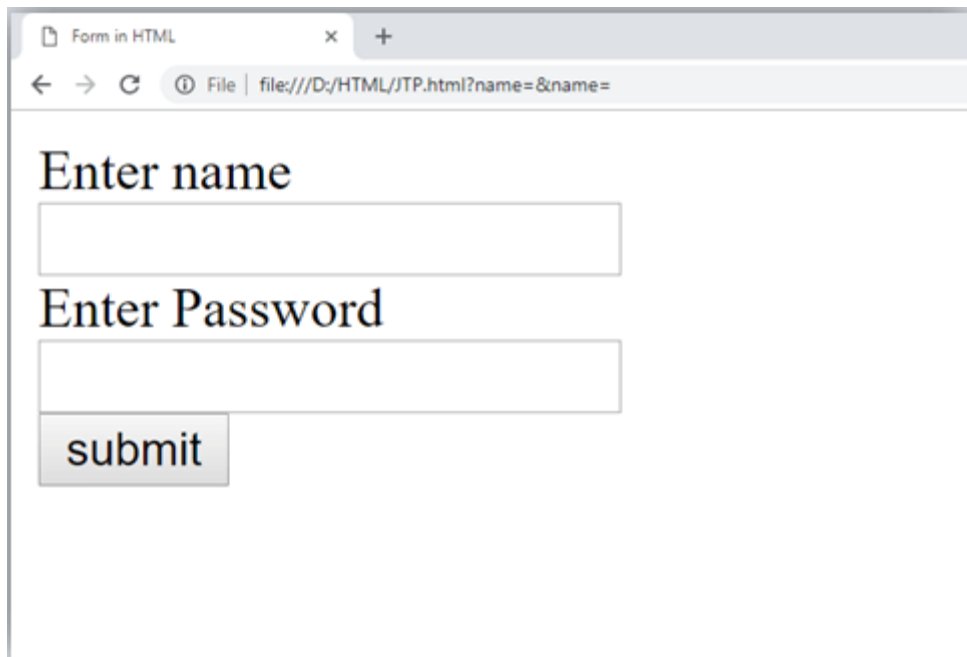
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```
<input type="Password" id="pass" name="pass"> <br>
```

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

```
</form>
```

Output:



HTML <fieldset> element:

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The <fieldset> element in HTML is used to group the related information of a form. This element is used with <legend> element which provide caption for the grouped elements.

Example:

```
<form>
```

```
  <fieldset>
```

```
    <legend>User Information:</legend>
```



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```
<label for="name">Enter name</label> <br>
<input type="text" id="name" name="name"> <br>
<label for="pass">Enter Password</label> <br>
<input type="Password" id="pass" name="pass"> <br>
<input type="submit" value="submit">
</fieldset>
lt;/form>
```

Output:

User Information: _____

Enter name

Enter Password

HTML Form Example

Following is the example for a simple form of registration.

```
<!DOCTYPE html>
<html>
<head>
<title>Form in HTML</title>
</head>
<body>
<h2>Registration form</h2>
```



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`<form>`

`<fieldset>`

`<legend>`User personal information`</legend>`

`<label>`Enter your full name`</label>` `
`

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

`<label>`Enter your email`</label>` `
`

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

`<label>`Enter your password`</label>` `
`

`<input type="password" name="pass">` `
`

`<label>`confirm your password`</label>` `
`

`<input type="password" name="pass">` `
`

`
``<label>`Enter your gender`</label>` `
`

`<input type="radio" id="gender" name="gender" value="male"/>`Male `
`

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

`<input type="radio" id="gender" name="gender" value="others"/>`others `
`

`
`Enter your Address:`
`

`<textarea>` `</textarea>` `
`

`<input type="submit" value="sign-up">`

`</fieldset>`

`</form>`

`</body>`

`</html>`

Test it Now

Output:



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Registration form

User personal information

Enter your full name

Enter your email

Enter your password

confirm your password

Enter your gender

- Male
 Female
 others

Enter your Address:

sign-up

HTML Form Example

Let's see a simple example of creating HTML form.

```
<form action="#">
```

```
<table>
```

```
<tr>
```

```
  <td class="tdLabel"><label for="register_name" class="label">Enter name:</label></td>
```

```
>
```

```
  <td><input type="text" name="name" value="" id="register_name" style="width:160px" /></td>
```

```
</tr>
```

```
<tr>
```

```
  <td class="tdLabel"><label for="register_password" class="label">Enter password:</label></td>
```

```
  <td><input type="password" name="password" id="register_password" style="width:160px" /></td>
```



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```
</tr>
<tr>
  <td class="tdLabel"><label for="register_email" class="label">Enter Email:</label></td>
  <td>
    <input type="email" name="email" value="" id="register_email" style="width:160px"/></td>
</tr>
<tr>
  <td class="tdLabel"><label for="register_gender" class="label">Enter Gender:</label></td>
  <td>
    <input type="radio" name="gender" id="register_gendermale" value="male"/>
    <label for="register_gendermale">male</label>
    <input type="radio" name="gender" id="register_genderfemale" value="female"/>
    <label for="register_genderfemale">female</label>
  </td>
</tr>
<tr>
  <td class="tdLabel"><label for="register_country" class="label">Select Country:</label></td>
  <td><select name="country" id="register_country" style="width:160px">
    <option value="india">india</option>
    <option value="pakistan">pakistan</option>
    <option value="africa">africa</option>
```



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```
<option value="china">china</option>
```

```
<option value="other">other</option>
```

</select> HTML <frame> tag (Not supported in HTML5)

HTML <frame> tag define the particular area within an HTML file where another HTML web page can be displayed.

A <frame> tag is used with <frameset>, and it divides a webpage into multiple sections or frames, and each frame can contain different web pages.

Note: Do not use HTML <frame> tag as it is not supported in HTML5, instead you can use <iframe> or <div> with CSS to achieve similar effects in HTML.

Syntax

```
< frame src = "URL" >
```

Following are some specifications about the HTML <frame> tag

Display	Block
Start tag/End tag	Start tag(required), End tag(forbidden)
Usage	Frames

Example 1

Create Vertical frames:

```
<!DOCTYPE html>
```

```
<html>
```

```
<head>
```

```
<title>Frame tag</title>
```

```
</head>
```

```
<frameset cols="25%,50%,25%">
```



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```
<frame src="frame1.html" >
```

```
<frame src="frame2.html">
```

```
<frame src="frame3.html">
```

```
</frameset>
```

```
</html>
```

Test it Now

Output:

This is the left frame

Lorem, ipsum dolor.
Lorem, ipsum dolor.
Lorem, ipsum dolor.

This is the right frame

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Duis ultricies nisl nec orci venenatis, vel mattis est interdum. Pellentesque habit morbi tristique senectus et netus et malesuada fames ac turpis egestas.

Frame1.html

```
<!DOCTYPE html>
```

```
<html>
```

```
<head>
```

```
<style>
```

```
div{
```

```
background-color: #7fffd4;
```



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```
        height: 500px;
    }
</style>
</head>
<body>
    <div>
        <h2>This is first frame</h2>
    </div>
</body>
</html>
```

Frame2.html

```
<!DOCTYPE html>
<html>
<head>
    <style>
        div{
            background-color: #2f4f4f;
            height: 500px;
        }
    </style>
</head>
<body>
    <div>
```



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```
<h2>This is Second frame</h2>
</div>
</body>
</html>
```

Frame3.html

```
<!DOCTYPE html>
<html>
<head>
<style>
div{
background-color: #c1ffc1;
height: 500px;
}
</style>
</head>
<body>
<div>
<h2>This is Third frame</h2>
</div>
</body>
</html>
```

Example 2:

Create Horizontal frames:



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```
<!DOCTYPE html>
<html>
<head>
  <title>Frame tag</title>
</head>
<frameset rows="30%, 40%, 30%">
  <frame name="top" src="frame1.html" >
  <frame name="main" src="frame2.html">
  <frame name="bottom" src="frame3.html">
</frameset>
</html>
```

Test it Now

Output:

This is the Top frame

This is the buttom frame

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Duis ultricies nisi nec orci venenatis, vel mattis est interdum. Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas.

Attribute

Tag-specific attribute



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Attribute	Value	Description
frameborder	0 1	It specifies whether to display a border around the frame or not, and its default value is 1
longdesc	URL	It specifies a page which contains the long description of the content of the frame.
marginheight	pixels	It specifies the top and bottom margins of the frame.
marginwidth	pixels	It defines the height of the margin between frames.
name	text	It is used to assign the name to the frame.
noresize	noresize	It is used to prevent resizing of the frame by the user.
scrolling	yes no auto	It specifies the existence of the scrollbar for overflowing content.
src	URL	It specifies the URL of the document which we want to display in a frame.

Supporting Browsers

</td>

</tr>

<tr>



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```
<td colspan="2"><div align="right"><input type="submit" id="register_0" value="register"/>
</div></td>
</tr>
</table>
</form>
```

[Test it Now](#)

What is CSS

CSS stands for Cascading Style Sheets. It is a style sheet language which is used to describe the look and formatting of a document written in markup language. It provides an additional feature to HTML. It is generally used with HTML to change the style of web pages and user interfaces. It can also be used with any kind of XML documents including plain XML, SVG and XUL.

CSS is used along with HTML and JavaScript in most websites to create user interfaces for web applications and user interfaces for many mobile applications.

What does CSS do

- You can add new looks to your old HTML documents.
- You can completely change the look of your website with only a few changes in CSS code.

Why use CSS

These are the three major benefits of CSS:



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1) Solves a big problem

Before CSS, tags like font, color, background style, element alignments, border and size had to be repeated on every web page. This was a very long process. For example: If you are developing a large website where fonts and color information are added on every single page, it will become a long and expensive process. CSS was created to solve this problem. It was a W3C recommendation.

2) Saves a lot of time

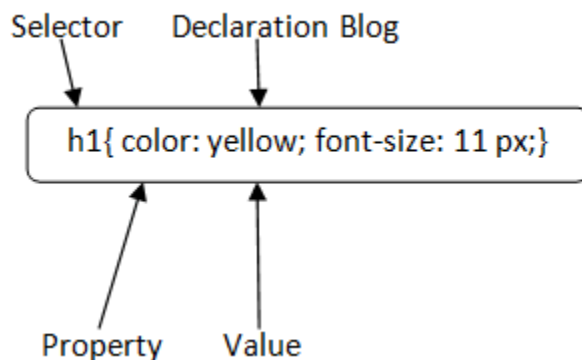
CSS style definitions are saved in external CSS files so it is possible to change the entire website by changing just one file.

3) Provide more attributes

CSS provides more detailed attributes than plain HTML to define the look and feel of the website.

CSS Syntax

A CSS rule set contains a selector and a declaration block.



Selector: Selector indicates the HTML element you want to style. It could be any tag like <h1>, <title> etc.



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Declaration Block: The declaration block can contain one or more declarations separated by a semicolon. For the above example, there are two declarations:

1. color: yellow;
2. font-size: 11 px;

Each declaration contains a property name and value, separated by a colon.

Property: A Property is a type of attribute of HTML element. It could be color, border etc.

Value: Values are assigned to CSS properties. In the above example, value "yellow" is assigned to color property.

1. Selector{Property1: value1; Property2: value2;;}

Types of CSS

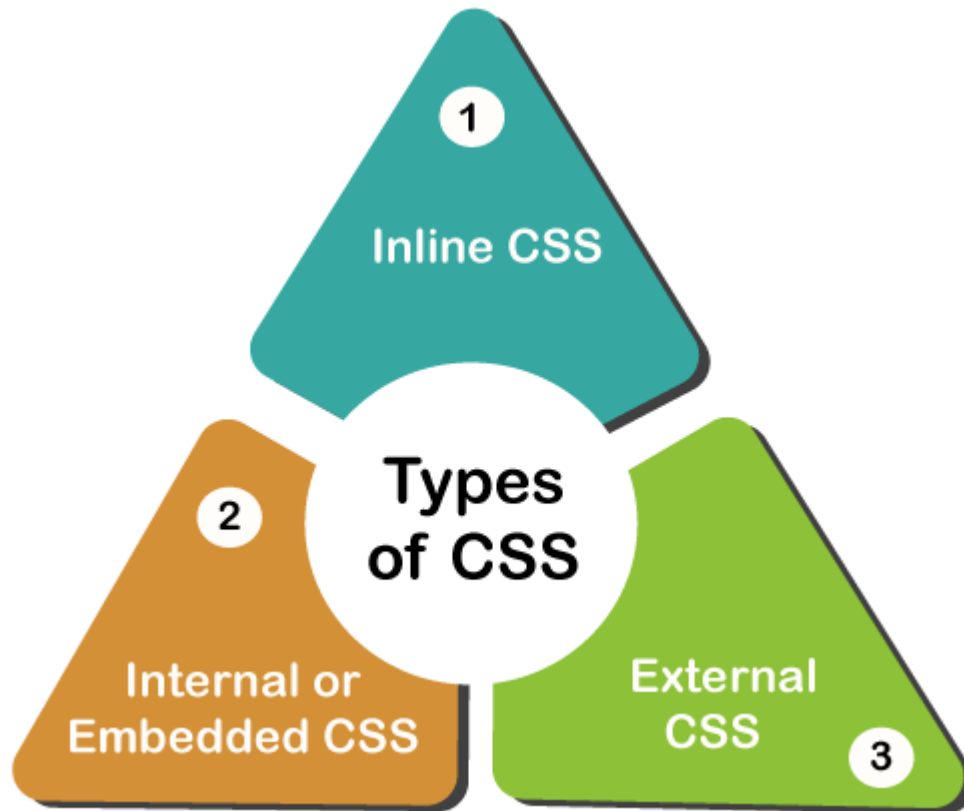
CSS (Cascading Style Sheet) describes the HTML elements which are displayed on **screen, paper**, or in **other media**. It saves a lot of time. It controls the layout of multiple web pages at one time. It sets the **font-size, font-family, color, background color** on the page.

It allows us to add **effects** or **animations** to the website. We use **CSS** to display **animations** like **buttons, effects, loaders** or **spinners**, and also **animated backgrounds**.

Without using **CSS**, the website will not look attractive. There are **3** types of **CSS** which are below:

- Inline CSS
- Internal/ Embedded CSS
- External CSS

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1. Internal CSS

The Internal CSS has **<style>** tag in the **<head>** section of the **HTML** document. This CSS style is an effective way to style single pages. Using the CSS style for multiple web pages is time-consuming because we require placing the **style** on each web page.

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We can use the internal CSS by using the following steps:

1. Firstly, open the **HTML** page and locate the **<head>**
2. Put the following code after the **<head>**

1. **<style type="text/css">**



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3. Add the **rules** of CSS in the new line.

Example:

1. body {
2. background-color: black;
3. }
4. h1 {
5. color: white;
6. padding: 50px;
7. }

4. Close the style tag.

1. **</style>**

After adding the internal CSS, the complete [HTML](#) file looks like the following:

1. **<!DOCTYPE html>**
2. **<html>**
3. **<head>**
4. **<style>**
5. body {
6. background-color: black;
7. }
8. h1 {
9. color: red;
10. padding: 50px;
11. }
12. **</style>**
13. **</head>**
14. **<body>**



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15. **<h2>**CSS types**</h2>**
16. **<p>**Cascading Style sheet types: inline, external and internal**</p>**
17. **</body>**
18. **</html>**

We can also use the selectors (**class and ID**) in the style sheet.

Example:

1. .class {
2. property1 : value1;
3. property2 : value2;
4. property3 : value3;
5. }
- 6.
7. #id {
8. property1 : value1;
9. property2 : value2;
10. property3 : value3;
11. }

Pros of Internal CSS

- **Internal CSS** cannot upload multiple files when we add the code with the HTML page.

Cons of Internal CSS:

- Adding code in the **HTML** document will reduce the **page size** and **loading time** of the webpage.



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2. External CSS

In external CSS, we link the web pages to the external **.css** file. It is created by **text editor**. The CSS is more efficient method for styling a website. By editing the **.css** file, we can change the whole site at once.

To use the external CSS, follow the steps, given below:

1. Create a new **.css** file with **text editor**, and add **Cascading Style Sheet** rules too.

For example:

1. `.xleftcol {`
2. `float: right;`
3. `width: 35%;`
4. `background:#608800;`
5. `}`
6. `.xmiddlecol {`
7. `float: right;`
8. `width: 35%;`
9. `background:#eff3df;`
10. `}`

2. Add a reference to the external **.css**file right after **<title> tag** in the **<head>** section of **HTML sheet**:

1. `<link rel="stylesheet" type="text/css" href="style.css" />`

Pros of External CSS:

- Our files have a cleaner structure and smaller in size.
- We use the same **.css** file for multiple web pages in external CSS.

Cons of External CSS:



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- The pages cannot be delivered correctly before the external CSS is loaded.
- In External CSS, uploading many CSS files can increase the download time of a website.

3. Inline CSS

Inline CSS is used to style a specific **HTML** element. Add a **style** attribute to each HTML tag without using the selectors. Managing a website may difficult if we use only **inline CSS**. However, Inline **CSS** in HTML is useful in some situations. We have not access the **CSS files** or to apply styles to element.

In the following example, we have used the inline CSS in **<p>** and **<h1>** tag.

1. `<!DOCTYPE html>`
2. `<html>`
3. `<body style="background-color:white;">`
4. `<h1 style="color:Red;padding:20px;">CSS Tutorials</h1>`
5. `<p style="color:blue;">It will be useful here.</p>`
6. `</body>`
7. `</html>`



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Features	CSS	CSS3
Compatibility	The primary purpose of CSS was to focus on formatting features. They have capabilities for positioning texts and objects. CSS is backward compatible with CSS3.	When CSS3 code is written in CSS, it is invalid. CSS3 makes the Web Pages more attractive. It takes less time to create a page.
Design	CSS does not support responsive design.	CSS3 is the latest version and supports the responsive design.
Modules	CSS is not divided into modules.	CSS3 could split into modules.
Animation	CSS cannot produce 3D animation and transformation.	In CSS3, the animation and 3D transformations are used. Elements are moved across the screen with the assistance of JavaScript and flash. By using the elements, also be ready to change the size and color. All kinds of transformations and animations are performed by using CSS3.
Rounded corners and gradient	When CSS3 was launched, the developers designed some images that looked like the rounded corners with the structures and backgrounds . Developers are designing a border and uploading the design to the server.	In CSS3 the developer writes the code like: round border {border-radius: 20px}. They have not been sent by any server and perform any other activities. Gradients will also be set by using the code which is given below: gradBG {Background:linear-gradient(red,black);}



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Text Effects and Text Animations	In CSS, animations are written in JavaScript and JQuery . It has not to design layer features and page elements. It had no special effects such as shadowing text, text animation , etc.	In CSS3, the developer adds text-shadows to make it easy and effective. They add words for the visual effects of the break line and a comfortable fit inside the column. It changes the size and color of the text.
Capacity	CSS is slower.	CSS3 is faster than CSS.
Color	CSS provides unique color schemas and standard color.	CSS3 supports HSL RGBA, HSLA and the gradient colors.
Blocks	Multi-column text blocks are defined in CSS3 .	CSS supports single text blocks.
Lists	<p>CSS allows a user to:</p> <ol style="list-style-type: none"> 1. It set different lists for ordered lists 2. CSS set an image for a list item marker 3. CSS add background colors to the list and list items. <p>Some list item markers are: list-style-type. These can be set circle, square, etc.</p>	<p>In CSS3, The list item has a counter and affected by counter increment and counter reset properties.</p> <p>In CSS if we use list in CSS3 the 'display' property must have a list defined in it. CSS3 cannot support a numbering system. The list style image property enables an image is set against the style type marker. It will set as inside the box or outside the box.</p>

Pros of inline CSS:

- We can create CSS rules on the HTML page.
- We cannot create and upload a separate document in inline CSS.



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Cons of inline CSS:

- Inline CSS, adding **CSS** rules to HTML elements is **time-consuming** and **messes** up the HTML structure.
- It styles multiple elements at the same time which can affect the page size and download time of the page.

CSS Background

CSS background property is used to define the background effects on element. There are 5 CSS background properties that affects the HTML elements:

1. background-color
2. background-image
3. background-repeat
4. background-attachment
5. background-position

1) CSS background-color

The background-color property is used to specify the background color of the element.

You can set the background color like this:

1. <!DOCTYPE html >
2. <html >
3. <head >
4. <style >
5. h2,p{
6. background-color: #b0d4de;



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7. }
8. `</style>`
9. `</head>`
10. `<body>`
11. `<h2>`My first CSS page.`</h2>`
12. `<p>`Hello Javatpoint. This is an example of CSS background-color.`</p>`
13. `</body>`
14. `</html>`

Test it Now

Output:

My first CSS page.

Hello Javatpoint. This is an example of CSS background-color.

2) CSS background-image

The background-image property is used to set an image as a background of an element. By default the image covers the entire element. You can set the background image for a page like this.

1. `<!DOCTYPE html>`
2. `<html>`
3. `<head>`
4. `<style>`
5. `body {`
6. `background-image: url("paper1.gif");`
7. `margin-left:100px;`
8. `}`
9. `</style>`



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10. `</head>`
11. `<body>`
12. `<h1>Hello Javatpoint.com</h1>`
13. `</body>`
14. `</html>`

Test it Now

Note: The background image should be chosen according to text color. The bad combination of text and background image may be a cause of poor designed and not readable webpage.

3) CSS background-repeat

By default, the background-image property repeats the background image horizontally and vertically. Some images are repeated only horizontally or vertically.

The background looks better if the image repeated horizontally only.

background-repeat: repeat-x;

1. `<!DOCTYPE html>`
2. `<html>`
3. `<head>`
4. `<style>`
5. `body {`
6. `background-image: url("gradient_bg.png");`
7. `background-repeat: repeat-x;`
8. `}`
9. `</style>`
10. `</head>`
11. `<body>`



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12. `<h1>Hello Javatpoint.com</h1>`
13. `</body>`
14. `</html>`

Test it Now

background-repeat: repeat-y;

1. `<!DOCTYPE html>`
2. `<html>`
3. `<head>`
4. `<style>`
5. `body {`
6. `background-image: url("gradient_bg.png");`
7. `background-repeat: repeat-y;`
8. `}`
9. `</style>`
10. `</head>`
11. `<body>`
12. `<h1>Hello Javatpoint.com</h1>`
13. `</body>`
14. `</html>`

Test it Now

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4) CSS background-attachment

The background-attachment property is used to specify if the background image is fixed or scroll with the rest of the page in browser window. If you set fixed the background image then the image will not move during scrolling in the browser. Let's take an example with fixed background image.



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1. background: white url('bbb.gif');
2. background-repeat: no-repeat;
3. background-attachment: fixed;

Test it Now

5) CSS background-position

The background-position property is used to define the initial position of the background image. By default, the background image is placed on the top-left of the webpage.

You can set the following positions:

1. center
 2. top
 3. bottom
 4. left
 5. right
-
1. background: white url('good-morning.jpg');
 2. background-repeat: no-repeat;
 3. background-attachment: fixed;
 4. background-position: center;

CSS Border

The CSS border is a shorthand property used to set the border on an element.

The [CSS](#) border properties are used to specify the style, color and size of the border of an element. The CSS border properties are given below

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- border-style
- border-color
- border-width
- border-radius

1) CSS border-style

The Border style property is used to specify the border type which you want to display on the web page.

There are some border style values which are used with border-style property to define a border.

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Value	Description
none	It doesn't define any border.
dotted	It is used to define a dotted border.
dashed	It is used to define a dashed border.
solid	It is used to define a solid border.
double	It defines two borders with the same border-width value.
groove	It defines a 3d grooved border. effect is generated according to border-color value.



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ridge	It defines a 3d ridged border. effect is generated according to border-color value.
inset	It defines a 3d inset border. effect is generated according to border-color value.
outset	It defines a 3d outset border. effect is generated according to border-color value.

1. `<!DOCTYPE html>`
2. `<html>`
3. `<head>`
4. `<style>`
5. `p.none {border-style: none;}`
6. `p.dotted {border-style: dotted;}`
7. `p.dashed {border-style: dashed;}`
8. `p.solid {border-style: solid;}`
9. `p.double {border-style: double;}`
10. `p.groove {border-style: groove;}`
11. `p.ridge {border-style: ridge;}`
12. `p.inset {border-style: inset;}`
13. `p.outset {border-style: outset;}`
14. `p.hidden {border-style: hidden;}`
15. `</style>`
16. `</head>`
17. `<body>`
18. `<p class="none">No border.</p>`
19. `<p class="dotted">A dotted border.</p>`
20. `<p class="dashed">A dashed border.</p>`
21. `<p class="solid">A solid border.</p>`
22. `<p class="double">A double border.</p>`
23. `<p class="groove">A groove border.</p>`
24. `<p class="ridge">A ridge border.</p>`



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25. `<p class="inset">An inset border.</p>`
26. `<p class="outset">An outset border.</p>`
27. `<p class="hidden">A hidden border.</p>`
28. `</body>`
29. `</html>`

Test it Now

Output:

No border.

A dotted border.

A dashed border.

A solid border.

A double border.

A groove border.

A ridge border.

An inset border.

An outset border.

A hidden border.



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2) CSS border-width

The border-width property is used to set the border's width. It is set in pixels. You can also use the one of the three pre-defined values, thin, medium or thick to set the width of the border.

1. `<!DOCTYPE html>`
2. `<html>`
3. `<head>`
4. `<style>`
5. `p.one {`
6. `border-style: solid;`
7. `border-width: 5px;`
8. `}`
9. `p.two {`
10. `border-style: solid;`
11. `border-width: medium;`
12. `}`
13. `p.three {`
14. `border-style: solid;`
15. `border-width: 1px;`
16. `}`
17. `</style>`
18. `</head>`
19. `<body>`
20. `<p class="one">Write your text here.</p>`
21. `<p class="two">Write your text here.</p>`
22. `<p class="three">Write your text here.</p>`
23. `</body>`
24. `</html>`

Test it Now



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3) CSS border-color

There are three methods to set the color of the border.

- Name: It specifies the color name. For example: "red".
- RGB: It specifies the RGB value of the color. For example: "rgb(255,0,0)".
- Hex: It specifies the hex value of the color. For example: "#ff0000".

There is also a border color named "transparent". If the border color is not set it is inherited from the color property of the element.

1. <!DOCTYPE html>
2. <html>
3. <head>
4. <style>
5. p.one {
6. border-style: solid;
7. border-color: red;
8. }
9. p.two {
10. border-style: solid;
11. border-color: #98bf21;
12. }
13. </style>
14. </head>
15. <body>
16. <p class="one">This is a solid red border</p>
17. <p class="two">This is a solid green border</p>
18. </body>
19. </html>



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What is xml

- **Xml** (eXtensible Markup Language) is a mark up language.
- XML is designed to store and transport data.
- Xml was released in late 90's. it was created to provide an easy to use and store self describing data.
- XML became a W3C Recommendation on February 10, 1998.
- XML is not a replacement for HTML.
- XML is designed to be self-descriptive.
- XML is designed to carry data, not to display data.
- XML tags are not predefined. You must define your own tags.
- XML is platform independent and language independent.

Why xml

Platform Independent and Language Independent: The main benefit of xml is that you can use it to take data from a program like Microsoft SQL, convert it into XML then share that XML with other programs and platforms. You can communicate between two platforms which are generally very difficult.

The main thing which makes XML truly powerful is its international acceptance. Many corporation use XML interfaces for databases, programming, office application mobile phones and more. It is due to its platform independent feature.

Features and Advantages of XML



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XML is widely used in the era of web development. It is also used to simplify data storage and data sharing.

The main features or advantages of XML are given below.

1) XML separates data from HTML

If you need to display dynamic data in your HTML document, it will take a lot of work to edit the HTML each time the data changes.

With XML, data can be stored in separate XML files. This way you can focus on using HTML/CSS for display and layout, and be sure that changes in the underlying data will not require any changes to the HTML.

2) XML simplifies data sharing

In the real world, computer systems and databases contain data in incompatible formats.

XML data is stored in plain text format. This provides a software- and hardware-independent way of storing data.

3) XML simplifies data transport

One of the most time-consuming challenges for developers is to exchange data between incompatible systems over the Internet.

Exchanging data as XML greatly reduces this complexity, since the data can be read by different incompatible applications.

4) XML simplifies Platform change

Upgrading to new systems (hardware or software platforms), is always time consuming. Large amounts of data must be converted and incompatible data is often lost.



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XML data is stored in text format. This makes it easier to expand or upgrade to new operating systems, new applications, or new browsers, without losing data.

5) XML increases data availability

Different applications can access your data, not only in HTML pages, but also from XML data sources.

With XML, your data can be available to all kinds of "reading machines" (Handheld computers, voice machines, news feeds, etc), and make it more available for blind people, or people with other disabilities.

XML Example

XML documents create a hierarchical structure looks like a tree so it is known as XML Tree that starts at "the root" and branches to "the leaves".

Example of XML Document

XML documents uses a self-describing and simple syntax:

1. `<?xml version="1.0" encoding="ISO-8859-1"?>`
2. `<note>`
3. `<to>Tove</to>`
4. `<from>Jani</from>`
5. `<heading>Reminder</heading>`
6. `<body>Don't forget me this weekend!</body>`
7. `</note>`

XML Validation

A well formed XML document can be validated against DTD or Schema.



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A well-formed XML document is an XML document with correct syntax. It is very necessary to know about valid XML document before knowing XML validation.

Valid XML document

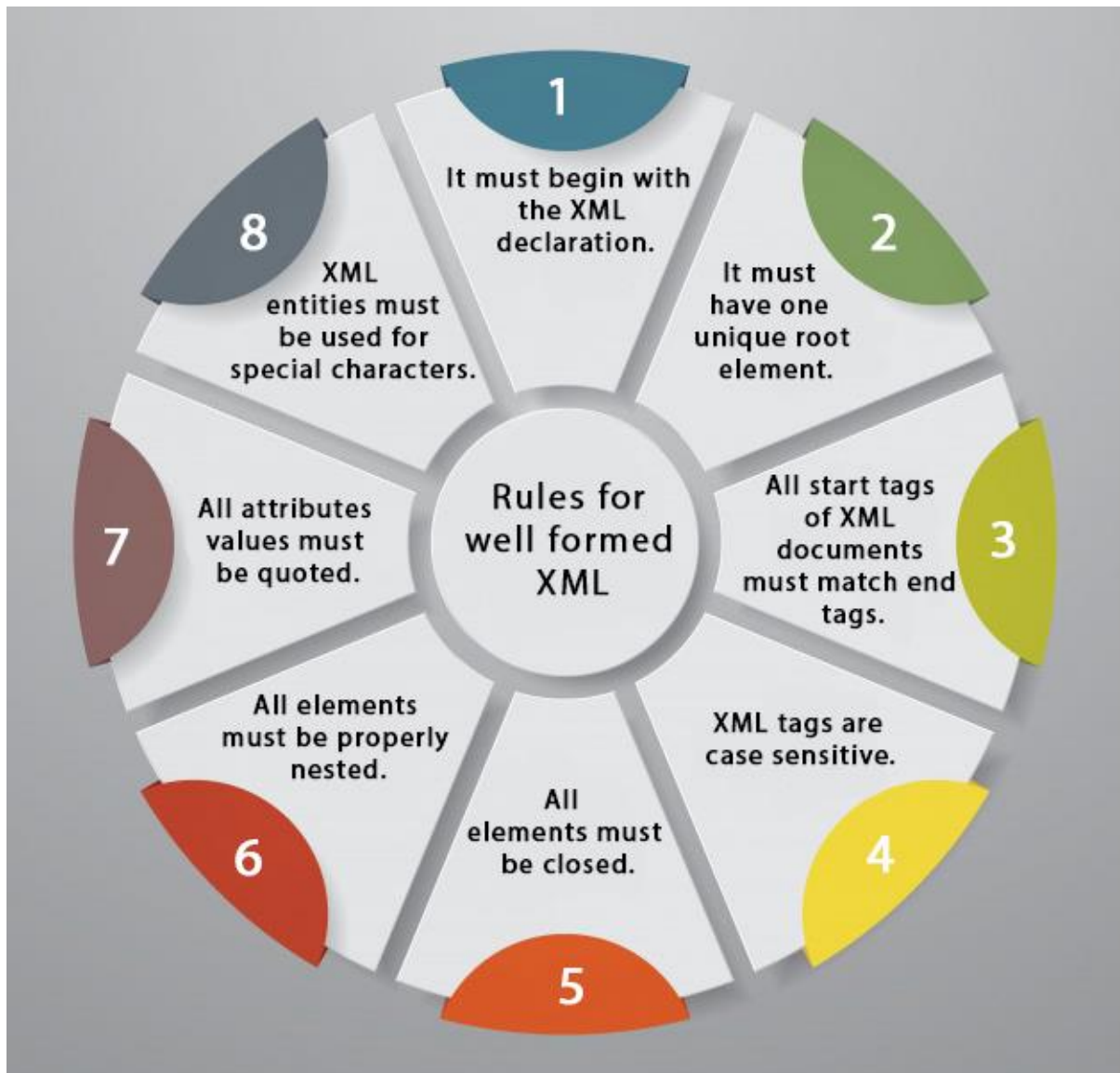
It must be well formed (satisfy all the basic syntax condition)

It should be behave according to predefined DTD or XML schema

Rules for well formed XML

- It must begin with the XML declaration.
- It must have one unique root element.
- All start tags of XML documents must match end tags.
- XML tags are case sensitive.
- All elements must be closed.
- All elements must be properly nested.
- All attributes values must be quoted.
- XML entities must be used for special characters.

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XML DTD

A DTD defines the legal elements of an XML document

In simple words we can say that a DTD defines the document structure with a list of legal elements and attributes.



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XML schema is a XML based alternative to DTD.

Actually DTD and XML schema both are used to form a well formed XML document.

We should avoid errors in XML documents because they will stop the XML programs.

XML schema

It is defined as an XML language

Uses namespaces to allow for reuses of existing definitions

It supports a large number of built in data types and definition of derived data types

What is DTD

DTD stands for **Document Type Definition**. It defines the legal building blocks of an XML document. It is used to define document structure with a list of legal elements and attributes.

Purpose of DTD

Its main purpose is to define the structure of an XML document. It contains a list of legal elements and define the structure with the help of them.

Checking Validation

Before proceeding with XML DTD, you must check the validation. An XML document is called "well-formed" if it contains the correct syntax.

A well-formed and valid XML document is one which have been validated against DTD.



Valid and well-formed XML document with DTD

Let's take an example of well-formed and valid XML document. It follows all the rules of DTD.

employee.xml

1. `<?xml version="1.0"?>`
2. `<!DOCTYPE employee SYSTEM "employee.dtd">`
3. `<employee>`
4. `<firstname>vimal</firstname>`
5. `<lastname>jaiswal</lastname>`
6. `<email>vimal@javatpoint.com</email>`
7. `</employee>`

In the above example, the DOCTYPE declaration refers to an external DTD file. The content of the file is shown in below paragraph.

employee.dtd

1. `<!ELEMENT employee (firstname,lastname,email)>`
2. `<!ELEMENT firstname (#PCDATA)>`
3. `<!ELEMENT lastname (#PCDATA)>`
4. `<!ELEMENT email (#PCDATA)>`

Description of DTD

<!DOCTYPE employee : It defines that the root element of the document is employee.

<!ELEMENT employee: It defines that the employee element contains 3 elements "firstname, lastname and email".

<!ELEMENT firstname: It defines that the firstname element is #PCDATA typed. (parse-able data type).



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<!ELEMENT lastname: It defines that the lastname element is #PCDATA typed. (parse-able data type).

<!ELEMENT email: It defines that the email element is #PCDATA typed. (parse-able data type).

XML DTD with entity declaration

A doctype declaration can also define special strings that can be used in the XML file.

An entity has three parts:

1. An ampersand (&)
2. An entity name
3. A semicolon (;)

Syntax to declare entity:

1. `<!ENTITY entity-name "entity-value">`

Let's see a code to define the ENTITY in doctype declaration.

author.xml

1. `<?xml version="1.0" standalone="yes" ?>`
2. `<!DOCTYPE author [`
3. `<!ELEMENT author (#PCDATA)>`
4. `<!ENTITY sj "Sonoo Jaiswal">`
5. `]>`
6. `<author>&sj;</author>`



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In the above example, sj is an entity that is used inside the author element. In such case, it will print the value of sj entity that is "Sonoo Jaiswal".

XML Schema

What is XML schema

XML schema is a language which is used for expressing constraint about XML documents. There are so many schema languages which are used now a days for example Relax- NG and XSD (XML schema definition).

An XML schema is used to define the structure of an XML document. It is like DTD but provides more control on XML structure.

Checking Validation

An XML document is called "well-formed" if it contains the correct syntax. A well-formed and valid XML document is one which have been validated against Schema.

XML Schema Example

Let's create a schema file.

employee.xsd

1. `<?xml version="1.0"?>`
2. `<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema"`
3. `targetNamespace="http://www.javatpoint.com"`
4. `xmlns="http://www.javatpoint.com"`
5. `elementFormDefault="qualified">`
- 6.
7. `<xs:element name="employee">`
8. `<xs:complexType>`



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9. `<xs:sequence>`
10. `<xs:element name="firstname" type="xs:string"/>`
11. `<xs:element name="lastname" type="xs:string"/>`
12. `<xs:element name="email" type="xs:string"/>`
13. `</xs:sequence>`
14. `</xs:complexType>`
15. `</xs:element>`
- 16.
17. `</xs:schema>`

Let's see the xml file using XML schema or XSD file.

employee.xml

1. `<?xml version="1.0"?>`
2. `<employee`
3. `xmlns="http://www.javatpoint.com"`
4. `xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"`
5. `xsi:schemaLocation="http://www.javatpoint.com employee.xsd">`
- 6.
7. `<firstname>vimal</firstname>`
8. `<lastname>jaiswal</lastname>`
9. `<email>vimal@javatpoint.com</email>`
10. `</employee>`

XML Schema Data types

There are two types of data types in XML schema.

1. simpleType
2. complexType



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simpleType

The simpleType allows you to have text-based elements. It contains less attributes, child elements, and cannot be left empty.

complexType

The complexType allows you to hold multiple attributes and elements. It can contain additional sub elements and can be left empty.

DTD vs XSD

There are many differences between DTD (Document Type Definition) and XSD (XML Schema Definition). In short, DTD provides less control on XML structure whereas XSD (XML schema) provides more control.

The important differences are given below:

No.	DTD	XSD
1)	DTD stands for Document Type Definition .	XSD stands for XML Schema Definition.
2)	DTDs are derived from SGML syntax.	XSDs are written in XML.
3)	DTD doesn't support datatypes .	XSD supports datatypes for elements and attributes.
4)	DTD doesn't support namespace .	XSD supports namespace .
5)	DTD doesn't define order for child elements.	XSD defines order for child elements.

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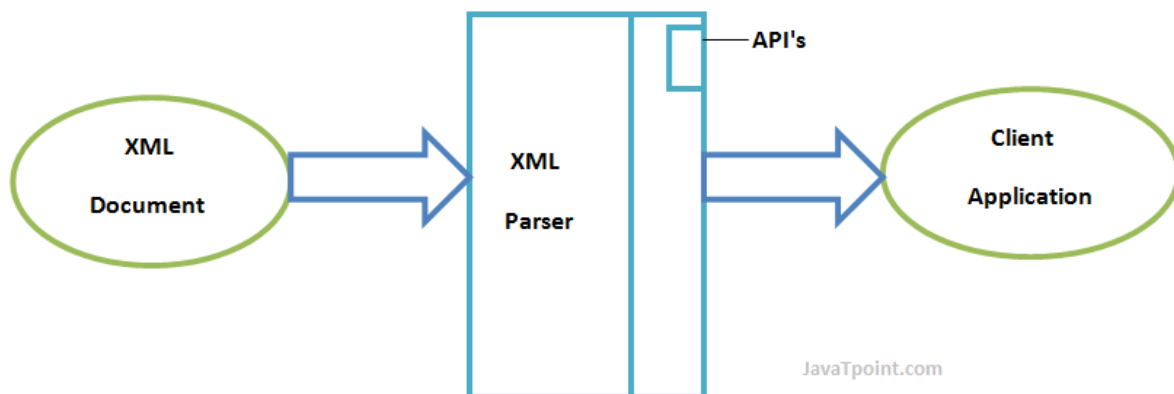
6)	DTD is not extensible .	XSD is extensible .
7)	DTD is not simple to learn .	XSD is simple to learn because you don't need to learn new language.
8)	DTD provides less control on XML structure.	XSD provides more control on XML structure.

XML Parsers

An XML parser is a software library or package that provides interfaces for client applications to work with an XML document. The XML Parser is designed to read the XML and create a way for programs to use XML.

XML parser validates the document and check that the document is well formatted.

Let's understand the working of XML parser by the figure given below:



Types of XML Parsers

These are the two main types of XML Parsers:



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1. DOM
2. SAX

DOM (Document Object Model)

A DOM document is an object which contains all the information of an XML document. It is composed like a tree structure. The DOM Parser implements a DOM API. This API is very simple to use.

Features of DOM Parser

A DOM Parser creates an internal structure in memory which is a DOM document object and the client applications get information of the original XML document by invoking methods on this document object.

DOM Parser has a tree based structure.

Advantages

- 1) It supports both read and write operations and the API is very simple to use.
- 2) It is preferred when random access to widely separated parts of a document is required.

Disadvantages

- 1) It is memory inefficient. (consumes more memory because the whole XML document needs to be loaded into memory).
- 2) It is comparatively slower than other parsers.

SAX (Simple API for XML)

A SAX Parser implements SAX API. This API is an event based API and less intuitive.



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Features of SAX Parser

It does not create any internal structure.

Clients does not know what methods to call, they just overrides the methods of the API and place his own code inside method.

It is an event based parser, it works like an event handler in Java.

Advantages

- 1) It is simple and memory efficient.
- 2) It is very fast and works for huge documents.

Disadvantages

- 1) It is event-based so its API is less intuitive.
- 2) Clients never know the full information because the data is broken into pieces.

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