

Lecture 9 - Java Web

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The Chinese University of Hong Kong, Shenzhen

CSC-1004: Computational Laboratory Using Java
Course Page: [\[Click\]](#)

Outline

- Hyper Text Markup Language (HTML)
- Java Servlet



HTML Introduction

Hyper Text Markup Language (HTML) creates web pages and web applications.

- **Hyper Text** is a text having a link within it. HyperText is a way to link two or more web pages (HTML documents) with each other.
- **Markup language** applies layout and formatting conventions to a text document. It can turn text into images, tables, links, etc.
- **Web Page** is commonly written in HTML and translated by a web browser. A web page can be identified by entering an URL. With the help of HTML only, we can create static web pages.



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HTML Introduction

let's see a simple example of HTML.

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

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



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HTML Introduction

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

<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.



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HTML Introduction

let's see a simple example of HTML.

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

<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)



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HTML Introduction

let's see a simple example of HTML.

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

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



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HTML Introduction

let's see a simple example of HTML.

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

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



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Building blocks of HTML

- **Tags:** An HTML tag surrounds the content and apply meaning to it. It is written between < and > brackets. A total of 110 tags!
- **Attribute:** An attribute in HTML provides extra information about the element, and it is applied within the start tag. An HTML attribute contains two fields: name and value.



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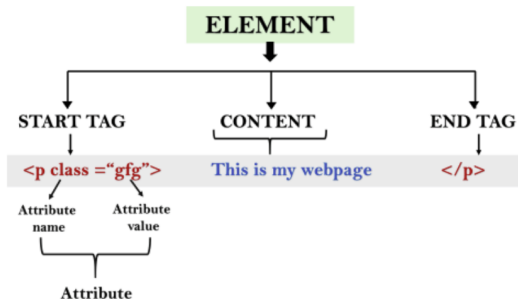
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Building blocks of HTML

Syntax:

```
<tag name attribute_name= " attr_value"> content </ tag name>
```

Elements: An HTML element is an individual component of an HTML file. In an HTML file, everything written within tags is termed as HTML element.



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HTML Anchor Tag

The HTML anchor tag defines a hyperlink that links one page to another page. It can create hyperlinks to other web pages as well as files, locations, or any URL.

Let's see an example of HTML anchor tag.

```
<!DOCTYPE html>
<html>
<head>
  <title></title>
</head>
<body>
<p>Click on <a href="https://www.javatpoint.com/" target="_blank"> this-link </a>to go on home page of JavaTpoint.</p>
</body>
</html>
```



Click on [this-link](https://www.javatpoint.com/) to go on home page of JavaTpoint.



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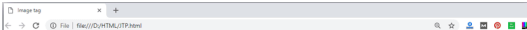
HTML Image Tag

HTML img tag is used to display images on the web page. HTML img tag is an empty tag that contains attributes only, closing tags are not used in HTML image elements.

Let's see an example of HTML img tag.

```

```



HTML image example with height and width



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HTML Table

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

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.



HTML Table

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

Let's see an example of HTML table tag.

```
<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>
```



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HTML Table

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

Let's see an example of HTML table tag.

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



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HTML Lists Tag

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).



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HTML Lists Tag

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:

Let's see an example of HTML list tag.

```
<ol>
```

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

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

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

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

```
</ol>
```

Output:

1. Aries

2. Bingo

3. Leo

4. Oracle



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HTML Form Tags

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



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HTML Form Tags

- HTML `<input>` element

The HTML `<input>` element is used to create form fields, to take input from user.

```
<body>
  <form>
    Enter your name <br>
    <input type="text" name="username">
  </form>
</body>
```

Enter your name



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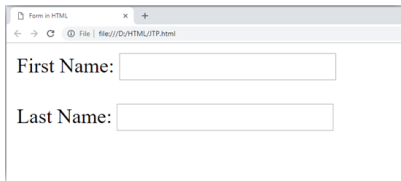
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HTML Form Tags

- HTML TextField

The `type="text"` attribute of the `input` tag creates textfield control also known as single-line textfield control.

```
<form>
  First Name: <input type="text" name="firstname"/> <br/>
  Last Name: <input type="text" name="lastname"/> <br/>
</form>
```



A screenshot of a web browser window titled "Form in HTML". The address bar shows the file path "file:///D:/HTML/TP.html". The browser displays the rendered HTML form, which consists of two single-line 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.



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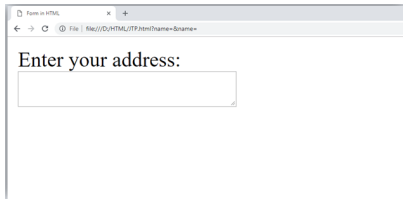
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HTML Form Tags

- HTML Textarea

The Textarea tag in HTML is used to insert multiple-line text in a form. The size of Textarea can be specified either using the "rows" or "cols" attributes or by CSS.

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

A screenshot of a web browser window titled "Form in HTML". The address bar shows the file path "file:///D:/HTML/1TP.html?name=&name=". The main content area displays the text "Enter your address:" followed by a two-line text input field (textarea).

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HTML Form Tags

- HTML Label

The Label tag is considered better to have label in form. As it makes the code parser/browser/user-friendly.

```
<form>
  <label for="firstname">First Name: </label> <br/>
    <input type="text" id="firstname" name="firstname"/> <br/>
  <label for="lastname">Last Name: </label>
    <input type="text" id="lastname" name="lastname"/> <br/>
</form>
```

First Name:

Last Name:



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HTML Form Tags

- HTML Password

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>
```

Password:



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HTML Form Tags

- **HTML Radio Button**

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

```
<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 <br/>
</form>
```

Gender: ☐ Male ☒ Female



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HTML Form Tags

- HTML Checkbox

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

```
<form>
Hobby:<br>
    <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>
```

Hobby:

- ☒ Cricket
- ☒ Football
- ☐ Hockey



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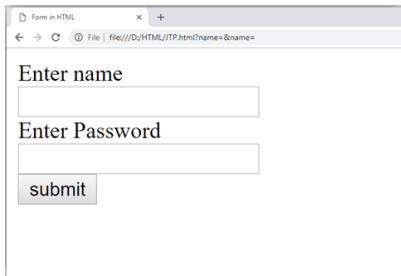
HTML Form Tags

- HTML Submit Button

HTML `<input type="submit">` is used to add a submit button on the web page.

When the user clicks on submit button, the form is submitted to the server.

```
<form>  
  <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">  
</form>
```



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HTML Form Tags

- HTML fieldset

The `<fieldset>` element groups the related information of a form. This element is used with `<legend>` element which provides a caption for the grouped elements.

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



User Information:

Enter name

Enter Password

submit



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HTML Form Attribute

The action attribute of `<form>` element defines the process to be performed on the form when the form is submitted, or it is a URI to process the form information.

```
<form action="action.html" method="post">
<label>User Name:</label><br>
<input type="text" name="name"><br><br>
<label>User Password</label><br>
<input type="password" name="pass"><br><br>
<input type="submit">
</form>
```

Demo of action attribute of form element

User Name:

User Password

Submit

It will redirect to a new page "action.html" when you click on submit button



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HTML Form Method Attribute

Method attributes define the HTTP method which the browser used to submit the form

- **post**: We can use the post value of the method attribute when we want to process the sensitive data as it does not display the submitted data in the URL.

```
<form action="action.html" method="post">
```

- **get**: The get value of the method attribute is the default value while submitting the form. But this is not secure as it displays data in the URL after submission.

```
<form action="action.html" method="get">
```

For example:

```
file:///D:/HTML/action.html?name=JavaTPoint&pass=123
```



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HTML Form Target Attribute

The target attribute defines where to open the response after submitting the form.

- **_self**: If we use `_self` as an attribute value, then the response will display on the current page only.

```
<form action="action.html" method="get" target="_self">
```

- **_blank**: If we use `_blank` as an attribute it will load the response in a new page.

```
<form action="action.html" method="get" target="_blank">
```



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HTML <input> element attribute

The target attribute defines where to open the response after submitting the form.

- **HTML name attribute:** The HTML name attribute defines the name of an input element. The name and value attribute are included in the HTTP request when we submit the form.

Note: One should not omit the name attribute as when we submit the form the HTTP request includes both name-value pairs and if the name is not available it will not process that input field.



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HTML <input> element attribute

The target attribute defines where to open the response after submitting the form.

- **HTML name attribute:** The HTML name attribute defines the name of an input element. The name and value attribute are included in the HTTP request when we submit the form.

```
<form action = "action.html" method = "get">  
  Enter name:<br><input type="name" name="uname"><br>  
  Enter age:<br><input type="number" name="age"><br>  
  Enter email:<br><input type="email"><br>  
  <input type="submit" value="Submit">  
</form>
```

Fill the form

Enter name:

Enter age:

Enter email:



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HTML <input> element attribute

The target attribute defines where to open the response after submitting the form.

- **HTML value attribute:** The HTML value attribute defines the initial value or default value of an input field.

```
<form>
```

```
  <label>Enter your Name</label><br>
```

```
  <input type="text" name="uname" value="Enter Name"><br><br>
```

```
  <label>Enter your Email-address</label><br>
```

```
  <input type="text" name="uname" value="Enter email"><br><br>
```

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

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

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

```
</form>
```

Fill the form

Enter your Name

Enter your Email-address

Enter your password



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HTML style using CSS

- Cascading Style Sheet (CSS)
 1. CSS is used to apply the style in the web page which is made up of HTML elements. It describes the look of the webpage.
 2. CSS provides various style properties such as background color, padding, margin, border-color, and many more, to style a webpage.
 3. Each property in CSS has a name-value pair, and each property is separated by a semicolon (;).



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HTML style using CSS

- In the below example, we have used a style attribute to provide some styling format to our code.

```
<body style="text-align: center;">  
  <h2 style="color: red;">Welcome to javaTpoint</h2>  
  <p style="color: blue; font-size: 25px; font-style: italic ;">This is a great website to learn technologies in very simple way. </p>  
</body>
```

Welcome to javaTpoint

This is a great website to learn technologies in very simple way.

HTML style using CSS

- **Inline CSS** is used to apply CSS in a single element. It can apply style uniquely in each element. To apply inline CSS, you need to use style attributes within HTML element. We can use as many properties as we want, but each property should be separated by a semicolon (;).

```
<h3 style="color: red;  
font-style: italic;  
text-align: center;  
font-size: 50px;  
padding-top: 25px;">Learning HTML using Inline CSS</h3>
```

*Learning HTML using
Inline CSS*



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HTML style using CSS

- **Internal CSS** contains the CSS properties for a webpage in <head> section of HTML document. To use Internal CSS, we can use class and id attributes.

```
<html>
<head>

  <style>

    /*Internal CSS using element name*/
    body{background-color:lavender;
    text-align: center;}
    h2{font-style: italic;
    font-size: 30px;
    color: #f08080;}
    p{font-size: 20px;}

    /*Internal CSS using class name*/
    .blue{color: blue;}
    .red{color: red;}
    .green{color: green;}

  </style>
</head>
```

```
<body>
  <h2>Learning HTML with internal CSS</h2>
  <p class="blue">This is a blue color paragraph</p>
  <p class="red">This is a red color paragraph</p>
  <p class="green">This is a green color paragraph</p>
</body>
</html>
```

Learning HTML with internal CSS

This is a blue color paragraph

This is a red color paragraph

This is a green color paragraph

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HTML style using CSS

- **External CSS** contains a separate CSS file that only contains style code. We can use this CSS file in any HTML file by using the `<link>` tag.

The style.css file.

```
body{
background-color:lavender;
text-align: center;}
h2{
font-style: italic;
size: 30px;
color: #f08080;}
p{
font-size: 20px;}
.blue{
color: blue;}
.red{
color: red;}
.green{
color: green;}
```

The .html file.

```
<!DOCTYPE html>
<html>
<head>
  <link rel="stylesheet" type="text/css" href="style.css">
</head>
<body>
  <h2>Learning HTML with External CSS</h2>
  <p class="blue">This is a blue color paragraph</p>
  <p class="red">This is a red color paragraph</p>
  <p class="green">This is a green color paragraph</p>
</body>
</html>
```

The webpage presentation.

Learning HTML with internal CSS

This is a blue color paragraph

This is a red color paragraph

This is a green color paragraph

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HTML Classes

- The HTML class attribute is used to specify single or multiple class names for an HTML element.
- The class name can be used by CSS to do some tasks for HTML elements.
- You can use this class in CSS with a specific class, write a period (.) character, followed by the name of the class for selecting elements.



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HTML Classes

Let's see an example of HTML Classes.

```
<!DOCTYPE html>
<html>
<head>
  <style>
    .headings{
      color: lightgreen;
      font-family: cursive;
      background-color: black; }
  </style>
</head>
<body>
<h1 class="headings">This is first heading</h1>
<h2 class="headings">This is Second heading</h2>
<h3 class="headings">This is third heading</h3>
<h4 class="headings">This is fourth heading</h4>
</body>
</html>
```

This is first heading

This is Second heading

This is third heading

This is fourth heading



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HTML JavaScript

JavaScript is a small program that is used with HTML to make web pages more attractive, dynamic, and interactive, such as an alert popup window on a mouse click.

Let's see an example of JavaScript.

```
<!DOCTYPE html>
<html>
<body>
<p>JavaScript can change the content of an HTML element:</p>
<button type="button" onclick="myFunction()">Click Me!</button>
<p id="demo"></p>
<script>
function myFunction() {
  document.getElementById("demo").innerHTML = "Hello JavaTpoint!";
}
</script>
</body>
</html>
```

JavaScript can change the content of an HTML element:

Click Me!

JavaScript can change the content of an HTML element:

Click Me!

Hello JavaTpoint!

HTML JavaScript

HTML events with JavaScript:

Event Event Name	Handler Name	Occurs when
onBlur	blur	When form input loses focus
onClick	click	When the user clicks on a form element or a link
onSubmit	submit	When user submits a form to the server.
onLoad	load	When page loads in a browser.
onFocus	focus	When user focuses on an input field.
onSelect	select	When user selects the form input filed.



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HTML JavaScript

Use External Script:

HTML code:

```
<!DOCTYPE html>
<html>
  <head>
    <script type="text/javascript" src="external.js"></script>
  </head>
  <body>
    <h2>External JavaScript Example</h2>
    <form onsubmit="fun()">
      <label>Enter your name:</label><br>
      <input type="text" name="uname" id="frm1"><br>
      <label>Enter your Email-address:</label><br>
      <input type="email" name="email"><br>
      <input type="submit">
    </form>
  </body>
</html>
```

JavaScript code:

```
function fun() {
    var x = document.getElementById("frm1").value;
    alert("Hi"+" "+x+" you have successfully submitted the details");
}
```

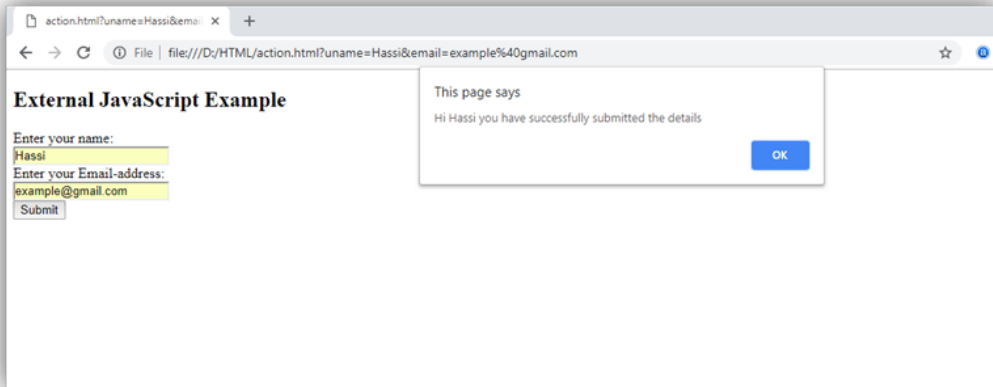


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HTML JavaScript

Use External Script:



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Question and Answering (Q&A)



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