What is HTML?

- HTML stands for **Hyper Text Markup Language**
- HTML is the most basic building block of the Web. It defines the meaning and structure of web content.
- It is **interpreted** by web browsers
- It is standardized by World Wide Web Consortium (W3C)
- Tim Berners-Lee was the primary author of HTML
- Latest version of HTML is 5.2
- It is based on predefined codes called **tags**
- It is case insensitive
- HTML files are also called as HTML documents
- HTML files are saved with .htm or .html extension

Anatomy of an HTML Element

An HTML element defines the **contents** to be displayed on the web page along with instructions to the browser, how to render those contents on the web page.

Such instructions are special predefined codes called **Tags.**

What is Tag?

- A tag is a special code enclosed in < and > symbols having predefined purpose e.g.

<img> tag is used to show the images on a web page

<video> tag is used to show the videos on a web page

 tag is used for line break

- It specifies formatting and layout instructions for your web page.

What are different types of tags?

- The tags can be of two types
    - Paired tags
    - Singular or Empty tags
- The tags which have opening and closing parts are called as paired tags e.g.
    - is used to make the enclosed text as bold
    - is used to make the enclosed text as italic

- <u></u> is used to make the enclosed text as underline

- The tags which have only opening part but no closing part are called as singular tags e.g.
  - <img> tag
  -
 tag

Structure of HTML Page

```
<!DOCTYPE html>
<html lang="en">
<head>
    <title>A simple HTML document</title>
</head>
<body>
    <p>Hello World!<p>
</body>
</html>
```

What is <!doctype html>?

- It defines the version number of HTML going to be used in current web page
- It helps the web browser to understand the structure of the web page defined in a file called **Document Type Definition** (DTD)

<!doctype html>

<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.01 Transitional//EN" "http://www.w3.org/TR/html4/loose.dtd">

Tags under <head> section

- The head section contains some sub tags which do not show the content on the web page e.g.

<title></title> tag

<script></script> tag

<style></style> tag

<meta> tag

<bgsound> tag

<link> tag

<base> tag

Tags under <body> section

- The body section contains some sub tags which display some contents on the web page e.g.

 tag

<h1></h1> tag

<a> tag

 tag

 tag

<u></u> tag

 tag

<img> tag

<video></video> tag

<form></form> tag

<table></table> tag

What are the heading tags?

- The tags used to show the text as heading as called as heading tags. HTML provides six types of heading tags.

<h1></h1> tag, called as heading 1. Biggest heading

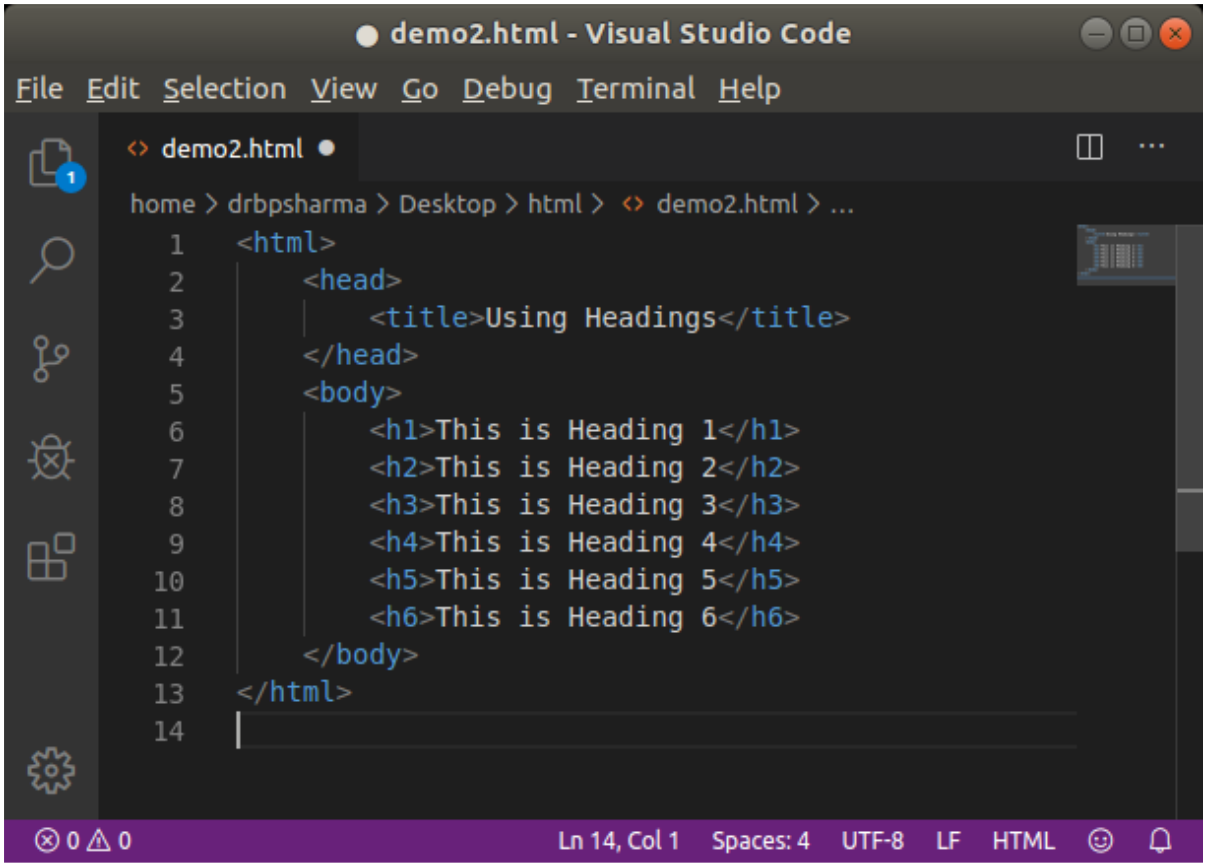
<h2></h2> tag, called as heading 2

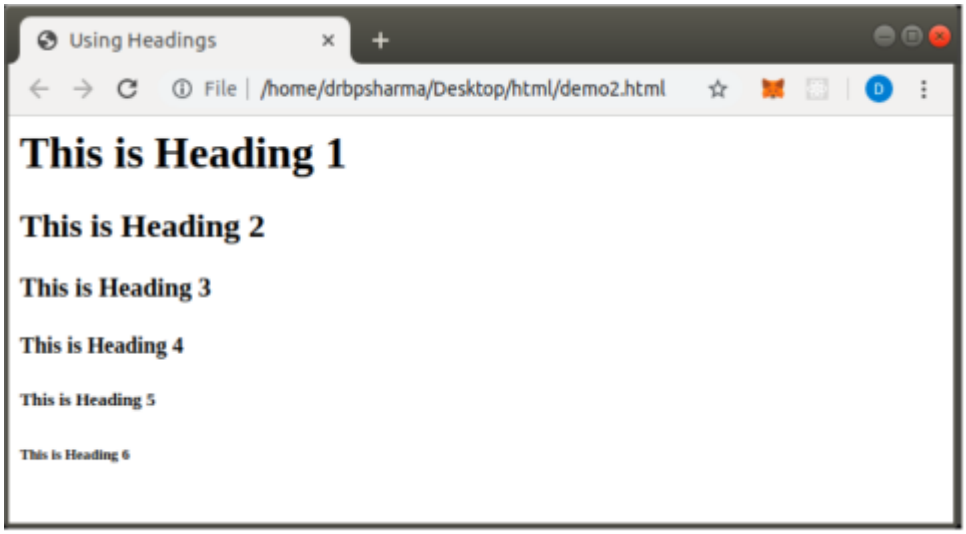
<h3></h3> tag, called as heading 3

<h4></h4> tag, called as heading 4

<h5></h5> tag, called as heading 5

<h6></h6> tag, called as heading 6. Smallest heading





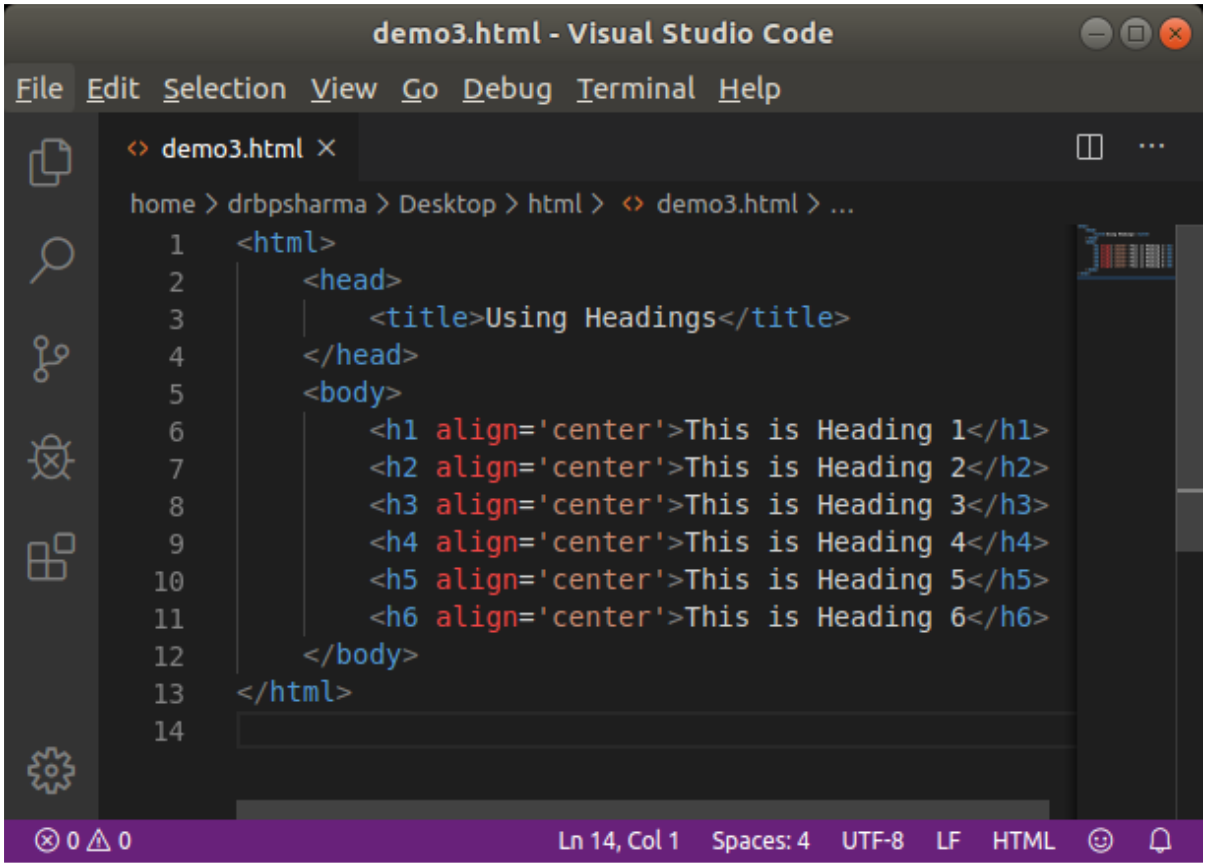
What are the attributes?

- The **properties** applied on the tags to perform advanced actions on the tags are called attributes.

For example,

All the heading tags have **align** attribute to align the text as **left, right or center**

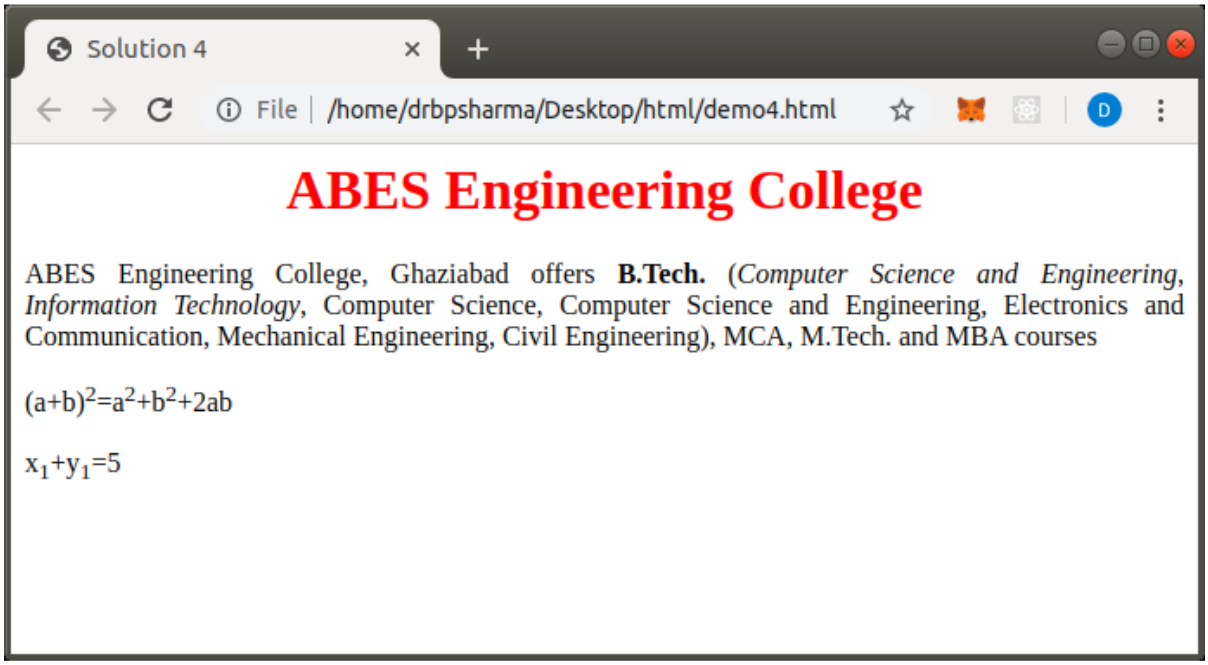
Note: Attributes are written in the opening part of the tag separated by space.

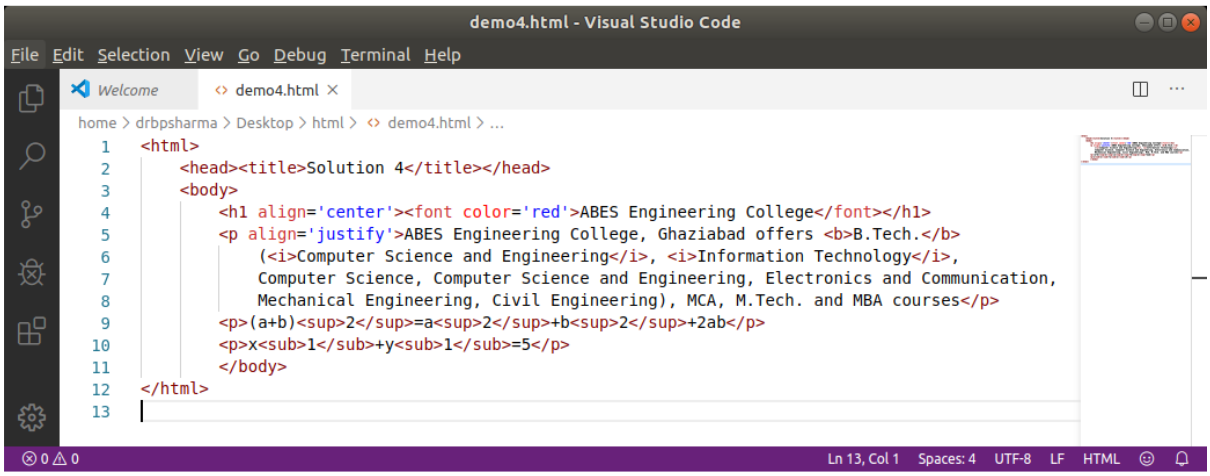


What are various text formatting tags in HTML?

- HTML provides many text formatting tags, some important ones are
  - **** to make some text as bold
  - **** to make some text as italic
  - **<u></u>** to make some text as underline
  - **** to make some text as superscript
  - **** to make some text as subscript
  - ** ** to create some paragraph. It also has align attribute
    - align='left | right | center | justify'

- **** to define the font name, color and size using different attributes
  - face='font name'
  - color='color name or color code'
  - size='n'





What is entity?

Sometimes we need to add some special characters and symbols in the web page. Such characters and symbols are added in HTML page using some pre-defined names and codes that start with & and closed with semicolon (;) are known as HTML Entities.

Entities can be of two types

- Named entities
- Numbered entities

Some of the named entities are

-    space
- > less than sign (<)
- < greater than sign (>)
- © copyright symbol (©)

Sum of the numbered entities are

- α α α
- β β β
- ₹ ₹

What is a Hyperlink? How to create it?

A hyperlink is a link to some web page, images, website, email, file etc. It is used to navigate some web page, website etc., It can also be used to download some file.

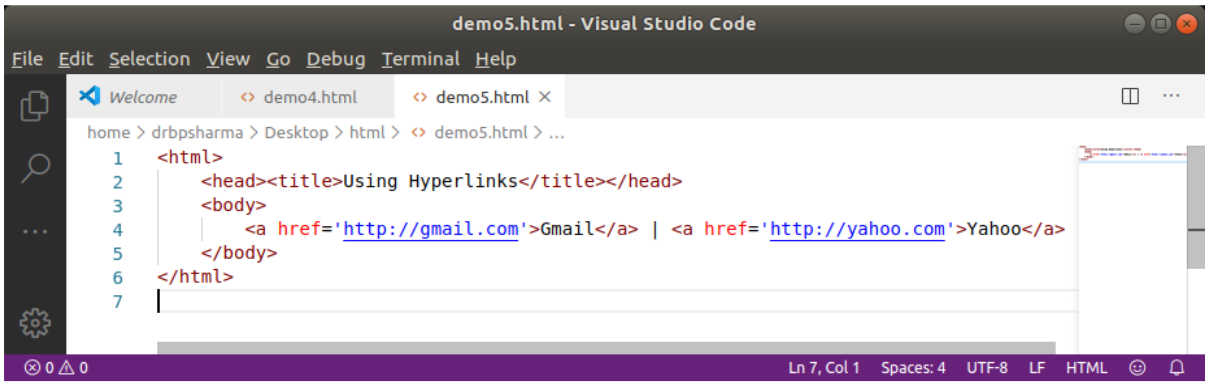
HTML provides **<a>** also known as anchor tag to create the hyperlinks with some attributes

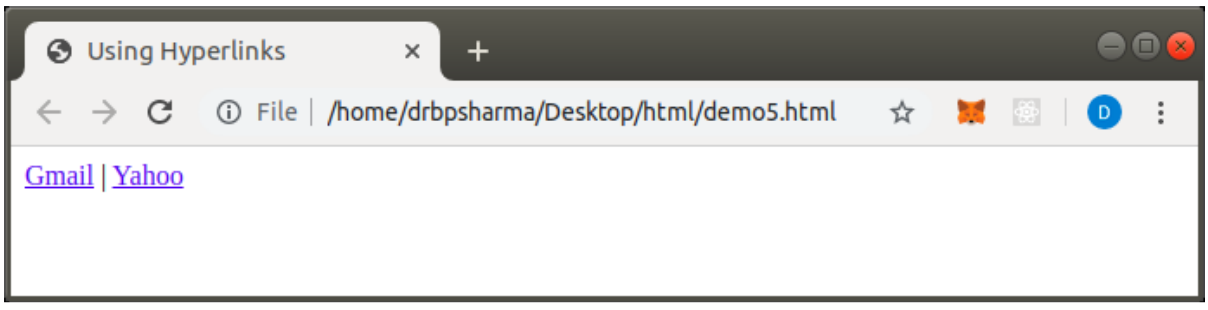
● href='url'

● title='some text'

● target='_blank'

Note: **URL** stands for **Uniform Resource Locator**. It is the path to reach some resource like image, video etc. Here **href** stands for **hyper reference** which means reference of the resource which you want to link. Here target='_blank' opens the given URL in new window or new tab.





What is anchor?

- A bookmark defined within the web page for navigation
- Syntaxes
    -
    - some text
- Use **#anchorname** while creating the hyperlinks to the anchors
- Syntax
    - some text or image

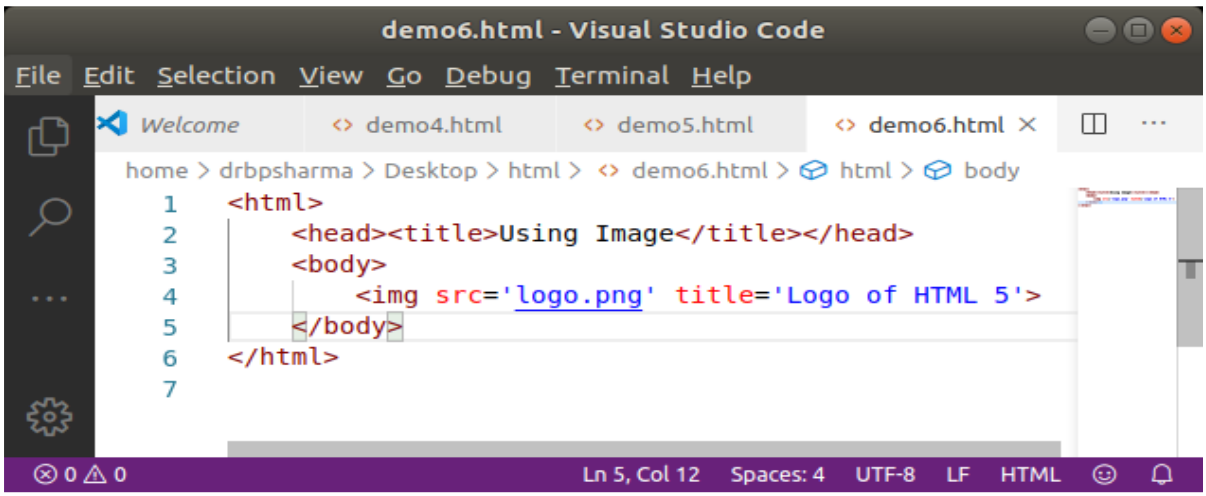
How to show an image on a web page?

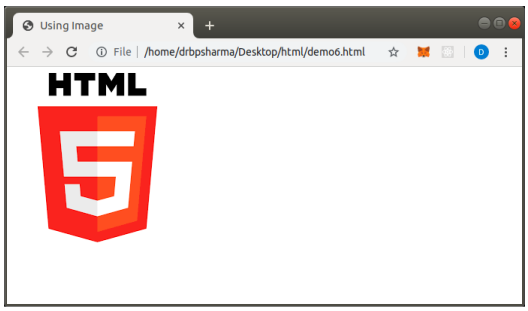
HTML provides <img> tag to insert an image into the webpage using following attributes

- src='source file name'
- width='x'
- height='y'
- alt='alternate text'
- title='image title'

Note: Web pages generally allow four types of image file

JPG or JPEG (Joint Photographic Experts Group)
PNG (Portable Network Graphics)
GIF (Graphic Interchange Format)
SVG (Scalable Vector Graphics)





What is list?

- A list is used for grouping the items
- HTML provides three types of lists
    - Ordered List <OL></OL>
    - Un-Ordered List <UL></UL>
    - Description List <DL></DL>

What is Ordered List?

- Ordered list provides a list in defined order based on numeric values or character values using **<OL></OL>** tag
- Use **type** attribute to define type of order
- Use **<LI></LI>** tag to define the list item
- Syntax

```
<OL type='1 | A | a | I | i'>
        <LI>item detail</LI>
</OL>
```

What is Un-ordered List?

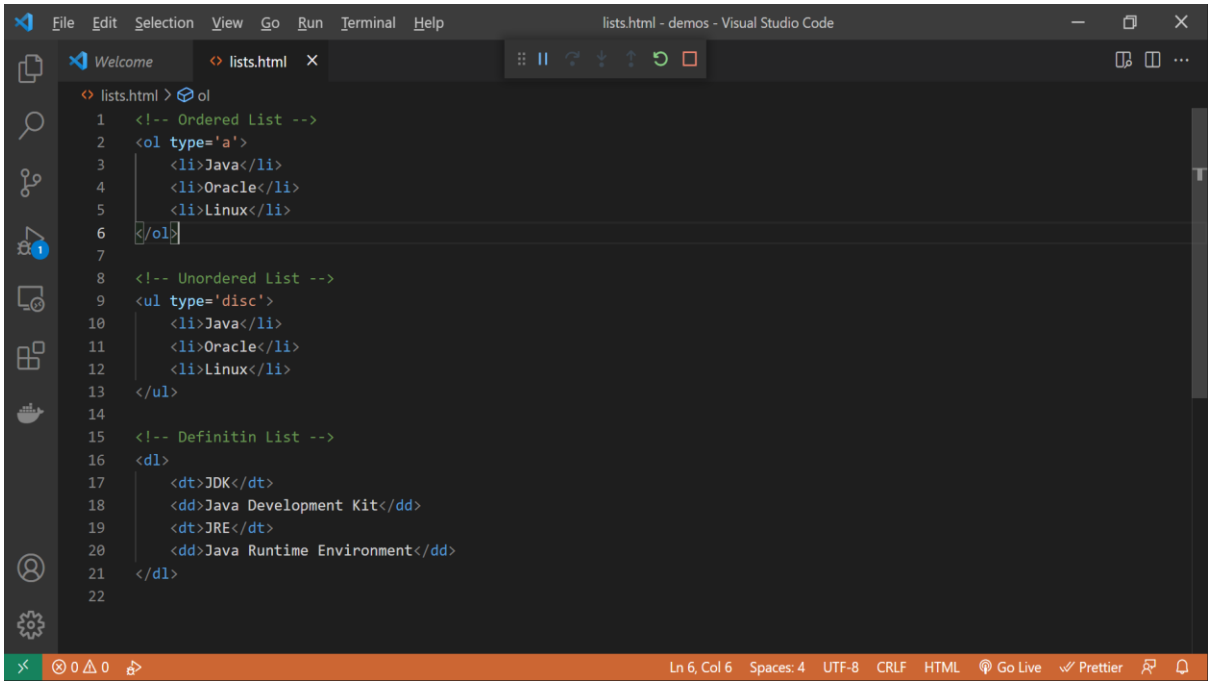
- Un-ordered list provides a list without an order using some symbols using **<UL></UL>** tag
- Use **type** attribute to define type of order
- Use **<LI></LI>** tag to define the list item
- Syntax

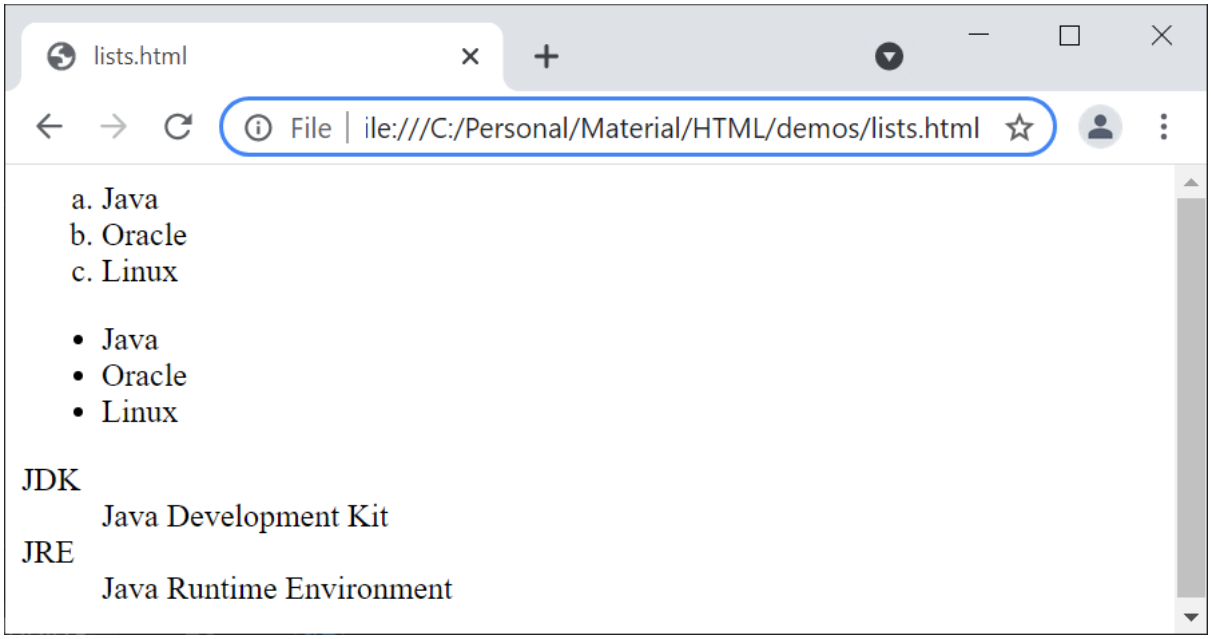
```
<UL type='disc | circle | square | none'>
        <LI>item detail</LI>
</UL>
```

What is Description List?

- The **description list <DL></DL>** provide the description of some items using **data term <DT></DT>** and **data description <DD></DD>** tag
- Syntax

```
<DL>
        <DT>data term</DT>
        <DD>data definition</DD>
</DL>
```

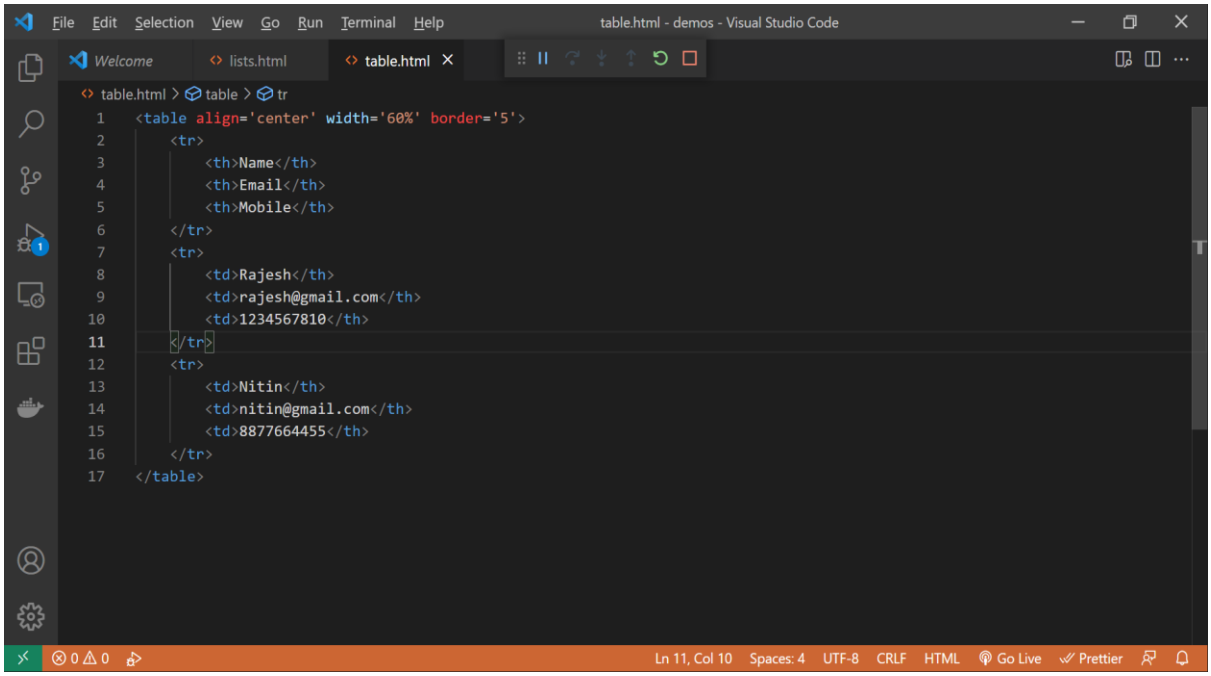


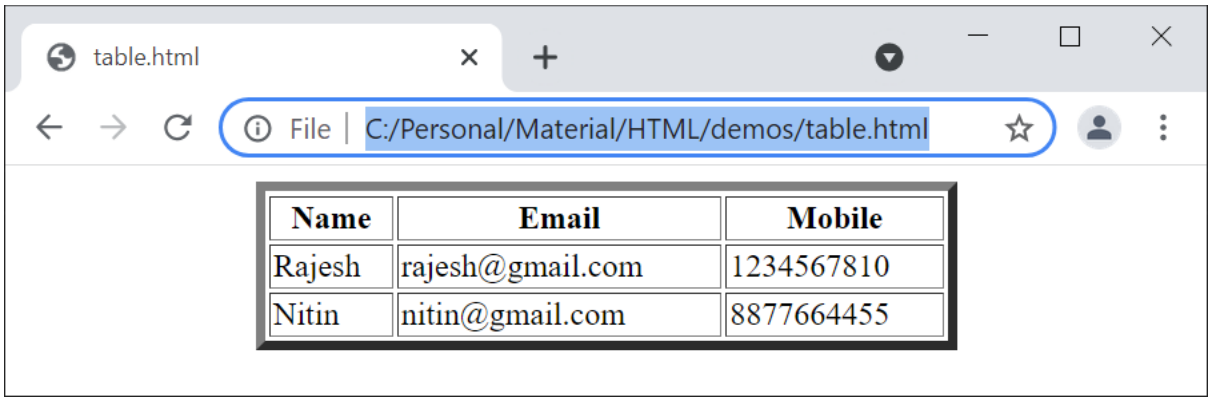


Creating Tables

- Use <TABLE></TABLE> tag to create a table with sub tags <TR></TR>, <TD></TD>, <TH></TH>
    - <TR></TR> defines the table row
    - <TD></TD> defines the table data
    - <TH></TH> defines the table heading
- Use attributes
    - align

- border
- width





Creating HTML Forms

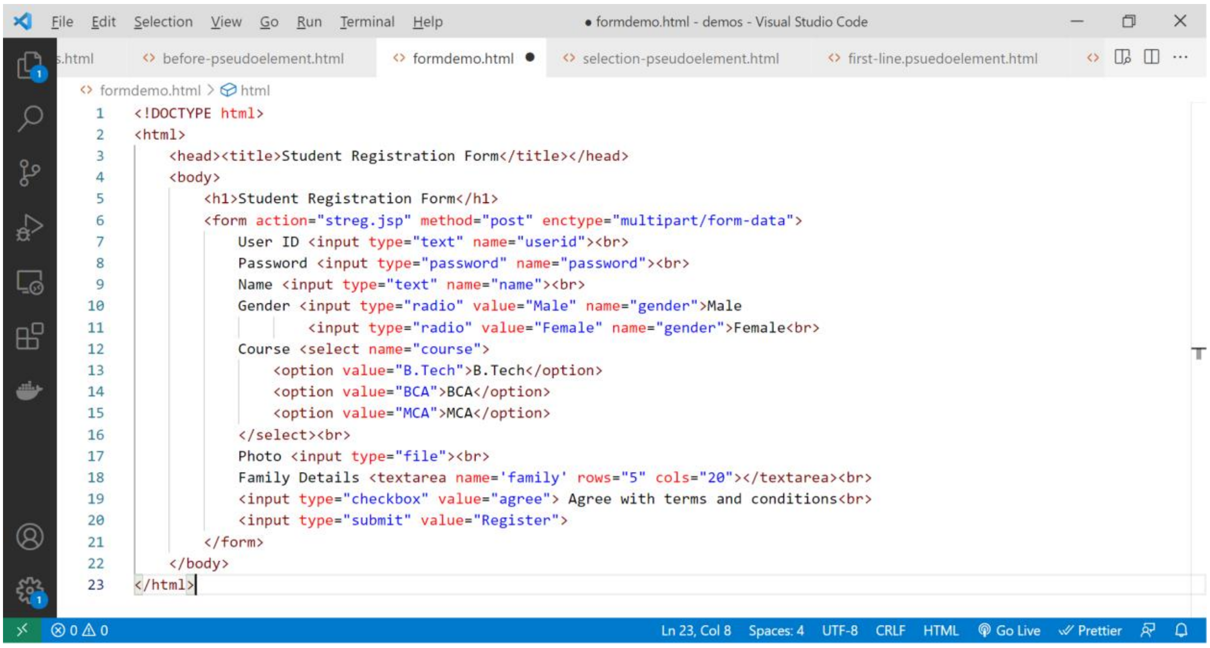
- Use **<form></form>** tag to define an HTML Form
- Attributes
  - **action**='server side url'
  - **method**='get | post'
  - **enctype**='multipart/form-data | application/x-www-form-urlencoded | text/plain '

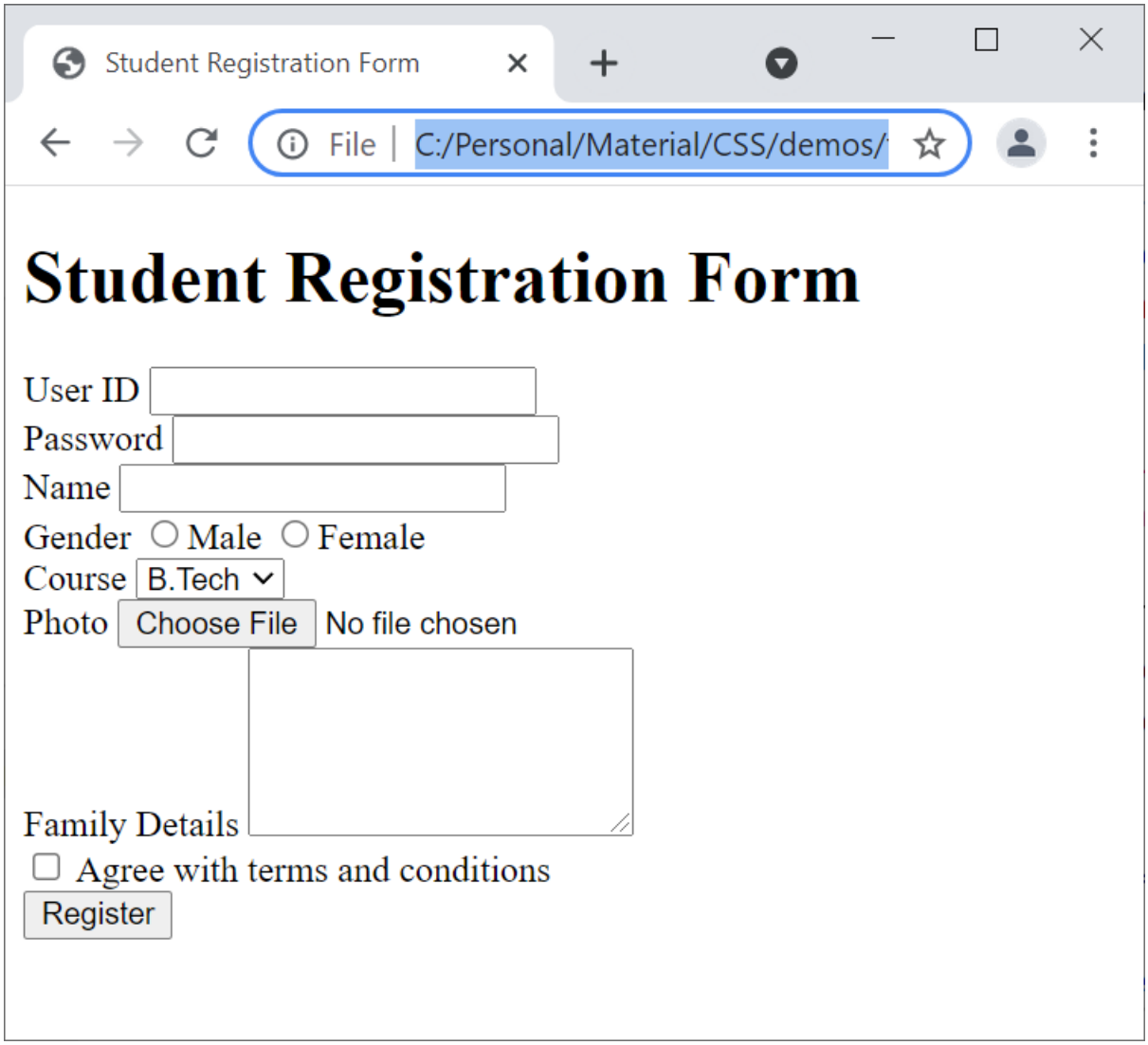
Creating Form Controls

- <label></label> tag
  - Used to define the label for an input element
  - Attribute
    - **for**='element id'

- **<input>** tag

    - Used to create various types of controls
    - type='text | password | checkbox | radio | file | button | submit | reset | hidden | date | time | datetime | number | email | url'
    - placeholder='water mark text'
    - required
    - autofocus
    - checked
    - size='n'
    - maxlength='n'
    - value='any value'
- The <textarea></textarea> tag
    - Used to create multiline text
- Attributes
    - rows='n'
    - Cols='n'
- The **<select></select>** tag
    - Used to create a dropdown list
    - Use <option></option> sub tag to defines the dropdown options
- Attribute
    - value='option value'





What is semantic HTML?

- A semantic element clearly describes its meaning to both the browser and the developer
- Using semantic HTML is noted as part of the HTML5 standard
- To define the layout of the web page, HTML provides various tags
    -
    - <section></section>
    - <header></header>
    - <footer></footer>
    - <main></main>
    - <aside></aside>
    - <nav></nav>
    - <article></article>
    - <code></code>

- <mark></mark>

What is CSS?

- CSS stands for cascading style sheets.
- It is a design language that makes a website look more appealing than just plain or uninspiring pieces of text.
- Whereas HTML largely determines textual content, CSS determines visual structure, layout, and aesthetics.
- HTML is a markup language, and CSS is a style sheet language.
- Think “look and feel” when you think CSS.

How to use the CSS?

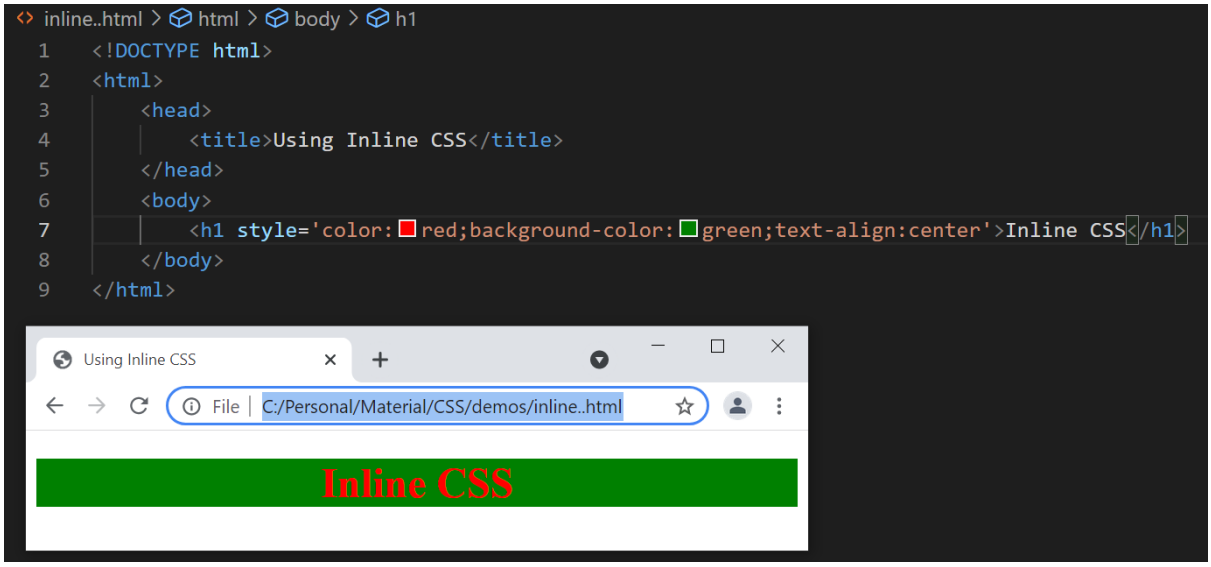
- CSS provides a big set of pre-defined properties to apply the styling on HTML contents using key:value pair model.
- Each key:pair is separated by semicolon
    - color:'color name or code'
    - background-color:'color name or code'
    - text-align:'left | right | center | justify‘
    - font-size:'n'
    - font-weight: 'bold'
    - font-family:'font name‘
    - text-transform:'uppercase | lowercase | capitalize'
    - text-decoration:'underline | overline | line-through| none‘
    - display:'none | block | inline'

What are different types using CSS?

- CSS can be applied using three ways
    - Inline CSS
    - Internal CSS
    - External CSS

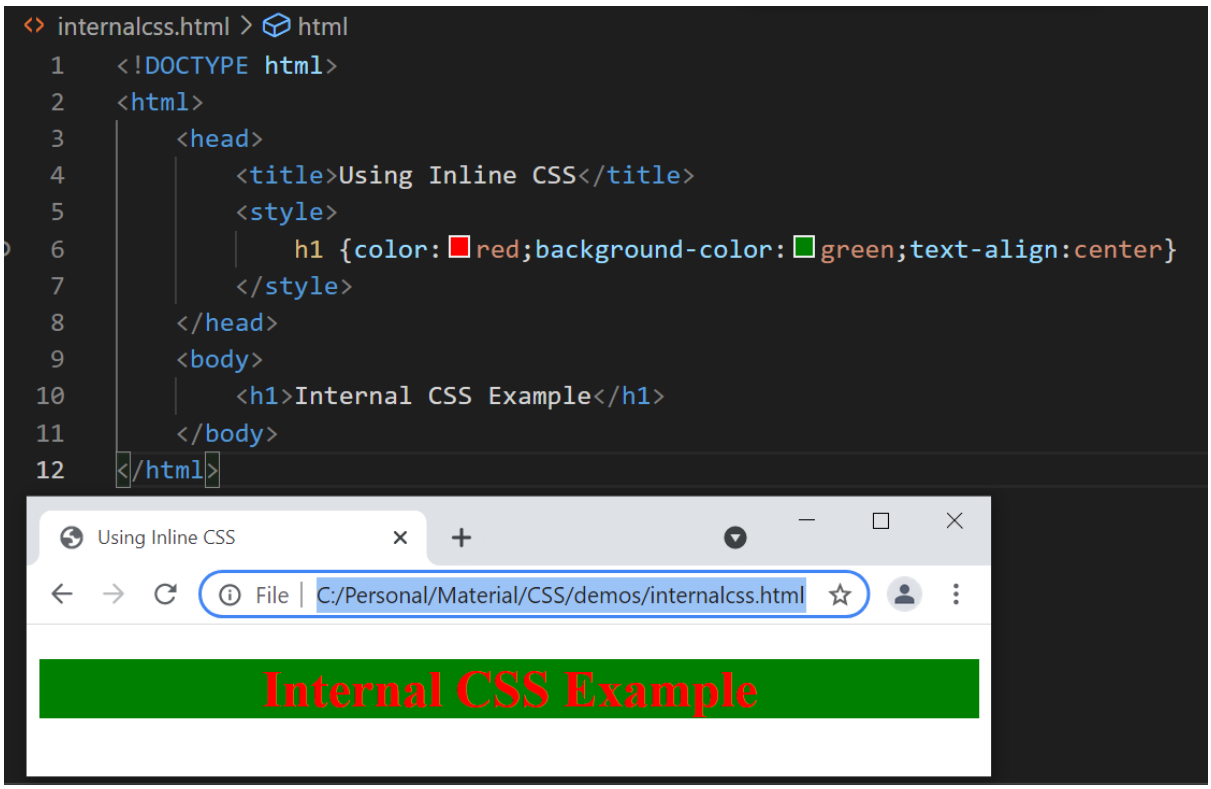
What is mean by Inline CSS?

- When the CSS codes get applied directly on a tag using **STYLE** attribute, it is known as inline CSS
- Use the codes using **key:value** pair model
- Use **semicolon (;)** when as separator when using multiple codes
- Just like HTML, CSS is also case insensitive



What is meant by Internal CSS?

- When we apply styling on all or selected set of elements in a web page, it is called as internal CSS
- Use **<style></style>** tag to create such styles



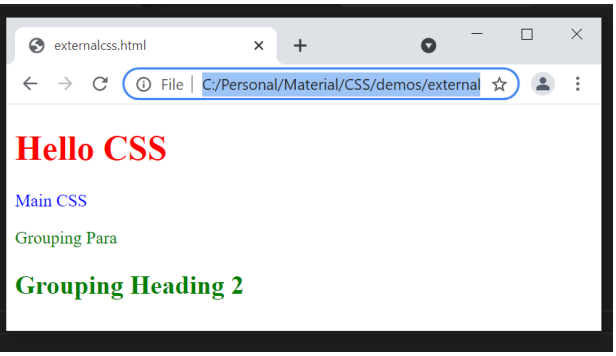
What is external CSS?

- We can create a file having styling effects and use that file in all the web pages of a website or even in multiple websites
- Such method of using styling is called as external CSS
- Here we need to use <link> tag to define the external CSS file name

<link href='filename.css' rel='stylesheet'>

```
styles.css > ...
1   h1 {color: red}
2   #main {color: blue}
3   .x {color: green}
```

```
externalcss.html > html
1   <!DOCTYPE html>
2   <html>
3       <head>
4           <link href="styles.css" rel="stylesheet">
5       </head>
6       <body>
7           <h1>Hello CSS</h1>
8           <p id='main'>Main CSS</p>
9           <p class="x">Grouping Para</p>
10          <h2 class="x">Grouping Heading 2</h2>
11      </body>
12  </html>
```



What is frame? How to create frames in HTML?

The <frame> tag is used to open multiple web pages in same window. Each frame can open separate web page. Each frame can be given some name and such frames can be interlinked using **target** attribute of <a> as well.

To divide the page into sections use <frameset></frameset> tag with rows and cols attributes to define the column width and row width for the frames.

Use **src** attribute of <frame> tag to define the page to open in some frame

Example

<!DOCTYPE html>

<html>

<head>

```
   <title>Frame tag</title>
</head>
 <frameset cols="25%,50%,25%">
   <frame src="frame1.html" >
   <frame src="frame2.html">
   <frame src="frame3.html">
 </frameset>
</html>
```

Note: <frame> and <frameset> tags are not supported in HTML 5. Use <iframe> tag instead.

What is <iframe> tag?

The <iframe></iframe> tag is used to open an inline frame. It can be used to merge some web page or youtube video etc. anywhere in the web page.

It has attributes like src, title.

Example

```
<iframe src="https://www.abes.ac.in" title="ABES Website"></iframe>
```

What is XML?

XML stands for eXtensible Markup Language. It is a platform independent mark-up language for storing and transporting data.

XML allows to define your own tags and sub tags along with their attributes.

Example

To manage the records of books present in a library, we can use XML by creating an XML document with .xml file extension e.g. books.xml file can contains the <library> tag, <book> tag, <title> tag, <author> tag and price tag with following containership.

The first line of document is used to define the version number of XML and generally called as prolog.

```
<?xml version="1.0"?>
```

XML file data

```
<?xml version="1.0"?>
<library>
 <book>
  <title>C Programming</title>
  <author>Denis Ritchie</author>
  <price>300</price>
 </book>
 <book>
  <title>Java Programming</title>
  <author>James Gosling</author>
  <price>500</price>
 </book>
</library>
```

What is the difference between HTML and XML?

XML and HTML were designed with different goals

- XML was designed to carry data while HTML was designed to display data
- XML tags allows to create your own tags while HTML has predefined tags
- XML is not interpreted by web browser directly but need extra support like XML Stylesheet to display formatted output while HTML is interpreted by web browsers

What is XML DTD?

DTD stands for Document Type Definition. It is used to define the structure and containership of tags used in XML document.

DTD provides ELEMENT tag to define the tags and their child tags. Use data type as #PCDATA to define the data as parseable character data or string data.

Use <!DOCTYPE> command to define the root element name and structure of XML document file. DTD is used by special softwares called XML parses to validate the XML documents.

Example of DTD

```
<?xml version="1.0"?>
<!DOCTYPE library
[
<!ELEMENT library (book)>
<!ELEMENT book (title, author, price)>
<!ELEMENT title (#PCDATA)>
<!ELEMENT author (#PCDATA)>
<!ELEMENT price (#PCDATA)>
```

```
]>
<library>
  <book>
    <title>C Programming</title>
    <author>Denis Ritchie</author>
    <price>300</price>
  </book>
  <book>
    <title>Java Programming</title>
    <author>James Gosling</author>
    <price>500</price>
  </book>
</library>
```

What is XML Schema?

An XML Schema describes the structure of an XML document, just like a DTD but in more advanced way. An XML document validated against an XML Schema is both "Well Formed" and "Valid".

DTD do not define the type of data a tag or attribute can store but schema can define it.

DTD cannot define how many times a sub tag can be used but schema can define it.

Schema requires a prefix called namespace to separate the schema of one XML document from other document.

Example

```
<?xml version="1.0"?>

<xs:schema xmlns:xs="https://abes.ac.in">

<xs:element name="library">

   <xs:element name="book">

     <xs:element name="title" type="xs:string"/>

     <xs:element name="author" type="xs:string"/>

     <xs:element name="price" type="xs:float"/>

   </xs:element>

</xs:element>

</xs:schema>
```

What is XML DOM?

The DOM defines a standard for accessing and manipulating documents. The XML DOM is a standard for how to get, change, add, or delete XML elements.

Example

```
<html>
<body>

<p id="demo"></p>

<script>
var text, parser, xmlDoc;

text = "<library><book>" +
"<title>C Programming</title>" +
"<author>Denis Ritchie</author>" +
"<price>405</price>" +
"</book></library>";

parser = new DOMParser();
xmlDoc = parser.parseFromString(text,"text/xml");

document.getElementById("demo").innerHTML =
xmlDoc.getElementsByTagName("book")[0].childNodes[0].nodeValue;
</script>

</body>
</html>
```

The DOM models XML as a set of node objects. The nodes can be accessed with JavaScript or other programming languages.
The programming interface to the DOM is defined by a set standard properties and methods.