

# Web Engineering Lab



## **Lab 03** **Introduction to HTML**

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## Images

There are many reasons why you might want to add an image to a web page: you might want to include a logo, photograph, illustration, diagram, or chart. There are several things to consider when selecting and preparing images for your site, but taking time to get them right will make it look more attractive and professional. In this session you will learn the following:

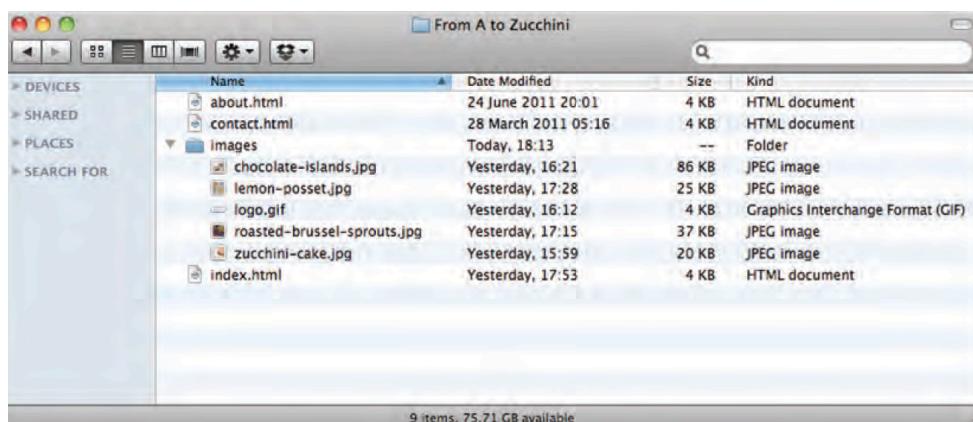
- Include an image in your web pages using HTML
- Pick which image format to use
- Show an image at the right size
- Optimize an image for use on the web to make pages load faster

*Note: You can also use CSS to include images in your pages using the background-image property*

### Storing Images on Your Site

If you are building a site from scratch, it is good practice to create a folder for all of the images the site uses. On a big site you might like to add subfolders inside the images folder. For example,

- images such as logos and buttons might sit in a folder called interface,
- product photographs might sit in a page called products, and
- images related to news might live in a folder called news.



### Adding Images

To add an image into the page you need to use an `<img>` element. This is an empty element (which means there is no closing tag). It must carry the following attributes:

- src : This tells the browser where it can find the image file. This will usually be a relative URL pointing to an image on your own site.
- alt: This provides a text description of the image which describes the image if you cannot see it.

**Example:**

```

1 
4

```



Note: The text used in the alt attribute is often referred to as alt text. It should give an accurate description of the image content so it can be understood by screen reader software (used by people with visual impairments) and search engines.

### Height and Width of Images

You will also often see an <img> element use two other attributes that specify its size:

- height : This specifies the height of the image in pixels.
- width: This specifies the width of the image in pixels.

Images often take longer to load than the HTML code that makes up the rest of the page. It is, therefore, a good idea to specify the size of the image so that the browser can render the rest of the text on the page while leaving the right amount of space for the image that is still loading.

**Example:**

```

1 
5

```

Note: The size of images is increasingly being specified using CSS rather than HTML.

## Images in Your Code

Where an image is placed in the code will affect how it is displayed. Here are three examples of image placement that produce different results:

- Before a paragraph
- Inside the start of a paragraph
- In the middle of a paragraph

### Example:

```
1 
3
4 <p>There are around 10,000 living species of birds that inhabit
5 different ecosystems from the Arctic to the Antarctic. Many
6 species undertake long distance annual migrations, and many more
7 perform shorter irregular journeys.</p>
8
9 <hr />
10
11 <p>There are around 10,000 living species of birds
13 that inhabit different ecosystems from the Arctic to the
14 Antarctic. Many species undertake long distance annual migrations,
15 and many more perform shorter irregular journeys.</p>
16
17 <hr />
18
19 <p>There are around 10,000 living species of birds that inhabit
20 different ecosystems from the Arctic to the Antarctic.
21 
22 Many species undertake long distance annual migrations, and many
23 perform shorter irregular journeys.</p>
24
```



There are around 10,000 living species of birds that inhabit different ecosystems from the Arctic to the Antarctic. Many species undertake long distance annual migrations, and many more perform shorter irregular journeys.



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## Three Rules for Creating Images

There are three rules to remember when you are creating images for your website which are as follow:

1. Save images in the right format
2. Save images at the right size

### 3. Use the correct resolution

#### Image Format

Whenever you have many different colors in a picture you should use a JPEG. A photograph that features snow or an overcast sky might look like it has large areas that are just white or gray, but the picture is usually made up of many different colors that are subtly different.

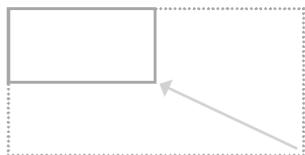
Use GIF or PNG format when saving images with few colors or large areas of the same color. When a picture has an area that is filled with exactly the same color, it is known as flat color. Logos, illustrations, and diagrams often use flat colors.

#### Image Dimensions

The images you use on your website should be saved at the same width and height that you want them to appear on the page. For example, if you have designed a page to include an image that is 300 pixels wide by 150 pixels tall, the image you use should be 300 x 150 pixels. You may need to use image editing tools to resize and crop the image.

##### REDUCING IMAGE SIZE

You can reduce the size of images to create a smaller version of the image.



**Example:** If your image is 600 pixels wide and 300 pixels tall, you can reduce the size of the image by 50%.

**Result:** This will create an image that is quicker to download.

##### INCREASING IMAGE SIZE

You can't increase the size of photos significantly without affecting the image quality.

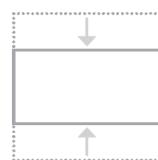


**Example:** If your image is only 100 pixels wide by 50 pixels tall, increasing the size by 300% would result in poor quality.

**Result:** The image will look blurry or blocky.

##### CHANGING SHAPE

Only some images can be cropped without losing valuable information (see next page).



**Example:** If your image is 300 pixels square, you can remove parts of it, but in doing so you might lose valuable information.

**Result:** Only some images can be cropped and still make sense.

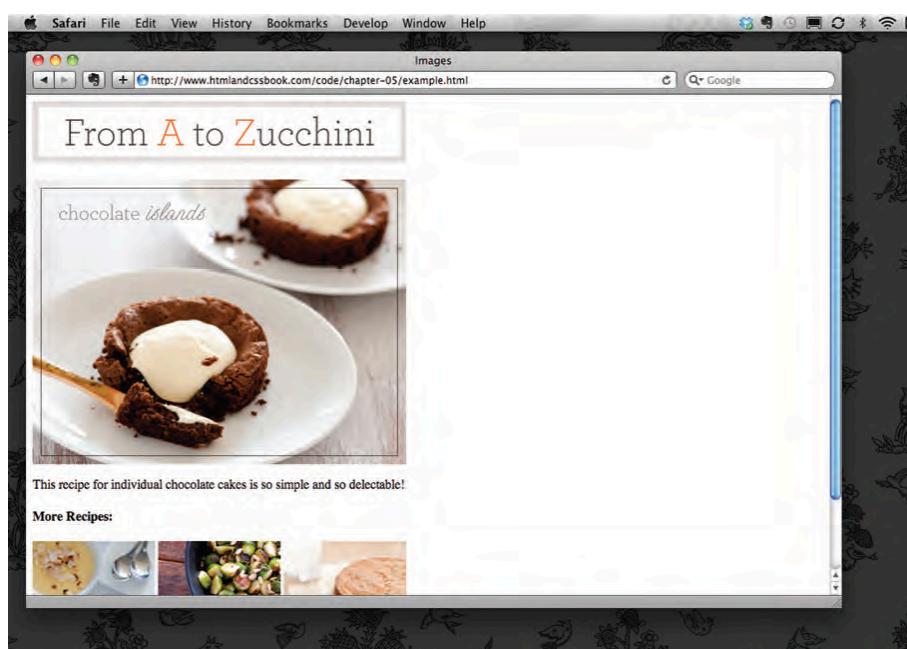
#### HTML 5: Figure and Figure Caption

Images often come with captions. HTML5 has introduced a new `<figure>` element to contain images and their caption so that the two are associated. You can have more than one image inside the `<figure>` element as long as they all share the same caption. The `<figcaption>` element has been added to HTML5 in order to allow web page authors to add a caption to an image.

```
1 <figure>
2   
3
4
5   <figcaption> This is the caption!!
6   </figcaption>
7
8 </figure>
```

## Example

```
1 <html>
2   <head>
3     <title>Images</title>
4   </head>
5   <body>
6     <h1>
7       
8     </h1>
9     <figure>
10       
13       <p>
14         <figcaption>
15           This recipe for individual chocolate
16             cakes is so simple and so delectable!
17         </figcaption>
18       </p>
19     </figure>
20     <h4>More Recipes:</h4>
21     <p>
22       
25       
28       
31     </p>
32   </body>
33 </html>
```



# Tables

There are several types of information that need to be displayed in a grid or table. For example: sports results, stock reports, train timetables. Grids allow us to understand complex data by referencing information on two axes. Each block in the grid is referred to as a table cell. In HTML a table is written out row by row. The `<table>` element is used to create a table.

## Table Row

You indicate the start of each row using the opening `<tr>` tag. (The tr stands for table row.) It is followed by one or more `<td>` elements (one for each cell in that row). At the end of the row you use a closing `</tr>` tag.

## Table Data

Each cell of a table is represented using a `<td>` element. (The td stands for table data.) At the end of each cell you use a closing `</td>` tag.

```
1 <html>
2 <head>
3   <title>tables</title>
4 </head>
5 <body>
6   <table>
7     <tr>
8       <td>15</td>
9       <td>15</td>
10      <td>30</td>
11    </tr>
12    <tr>
13      <td>45</td>
14      <td>60</td>
15      <td>45</td>
16    </tr>
17    <tr>
18      <td>60</td>
19      <td>90</td>
20      <td>90</td>
21    </tr>
22  </table>
23 </body>
24 </html>
25
```

15	15	30
45	60	45
60	90	90

## Table Heading

The `<th>` element is used just like the `<td>` element but its purpose is to represent the heading for either a column or a row. (The th stands for table heading. Even if a cell has no content, you should still use a `<td>` or `<th>` element to represent the presence of an empty cell otherwise the table will not render correctly. (The first cell in the first row of this example shows an empty cell.)

You can use the `scope` attribute on the `<th>` element to indicate whether it is a heading for a column or a row. It can take the values: `row` to indicate a heading for a row or `col` to indicate a heading for a column.

```

1 <table>
2   <tr>
3     <th></th>
4     <th scope="col">Saturday</th>
5     <th scope="col">Sunday</th>
6   </tr>
7   <tr>
8     <th scope="row">Tickets sold:</th>
9     <td>120</td>
10    <td>135</td>
11  </tr>
12  <tr>
13    <th scope="row">Total sales:</th>
14    <td>$600</td>
15    <td>$675</td>
16  </tr>
17 </table>

```

## Saturday Sunday

**Tickets sold:** 120      135

**Total sales:** \$600      \$675

## Spanning Columns

Sometimes you may need the entries in a table to stretch across more than one column. The `colspan` attribute can be used on a `<th>` or `<td>` element and indicates how many columns that cell should run across.

```

1 <html>
2   <head>
3     <title>Spanning Columns</title>
4     <style type="text/css"> . . .
5   </head>
6   <body>
7     <table>
8       <tr>
9         <th></th>
10        <th>9am</th>
11        <th>10am</th>
12        <th>11am</th>
13        <th>12am</th>
14      </tr>
15      <tr>
16        <th>Monday</th>
17        <td colspan="2">Geography</td>
18        <td>Math</td>
19        <td>Art</td>
20      </tr>
21      <tr>
22        <th>Tuesday</th>
23        <td colspan="3">Gym</td>
24        <td>Home Ec</td>
25      </tr>
26    </table>
27  </body>
28 </html>

```

	9am	10am	11am	12am
<b>Monday</b>	Geography		Math	Art
<b>Tuesday</b>	Gym			Home Ec

## Spanning Rows

You may also need entries in a table to stretch down across more than one row. The rowspan attribute can be used on a <th> or <td> element to indicate how many rows a cell should span down the table.

```
1 <html>
2   <head>
3     <title>Spanning Rows</title>
4     <style type="text/css">
5       table {
6         border: none;
7         th, td {
8           border: none;
9           background-color: #dddddd;
10          padding: 5px;
11          width: 100px;
12        }
13      }
14    </style>
15  </head>
16  <body>
17    <table>
18      <tr>
19        <th></th>
20        <th>ABC</th>
21        <th>BBC</th>
22        <th>CNN</th>
23      </tr>
24      <tr>
25        <th>6pm - 7pm</th>
26        <td rowspan="2">Movie</td>
27        <td>Comedy</td>
28        <td>News</td>
29      </tr>
30      <tr>
31        <th>7pm - 8pm</th>
32        <td>Sport</td>
33        <td>Current Affairs</td>
34      </tr>
35    </table>
36  </body>
37 </html>
```

	ABC	BBC	CNN
6pm - 7pm	Movie	Comedy	News
7pm - 8pm		Sport	Current Affairs

## Long Table

There are three elements that help distinguish between the main content of the table and the first and last rows (which can contain different content).

<thead>

The headings of the table should sit inside the <thead> element.

<tbody>

The body should sit inside the <tbody> element.

<tfoot>

The footer belongs inside the <tfoot> element.

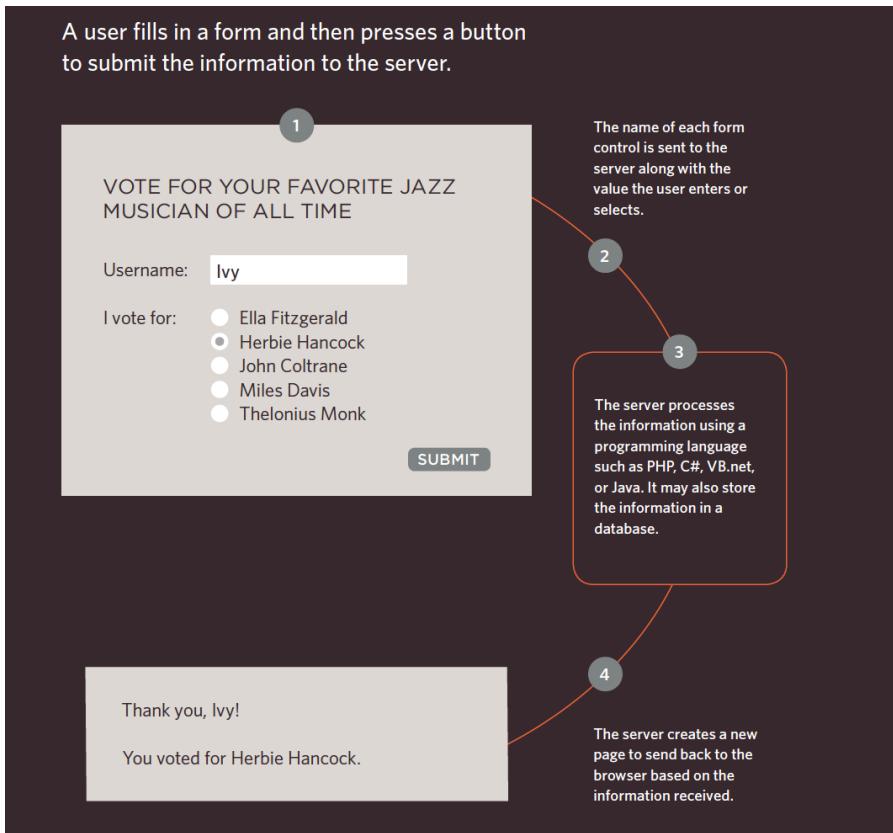
**Example:**

	Date	Income	Expenditure
1	1st January	250	36
2	2nd January	285	48
3	3rd January	260	42
4	4th January	290	38
5	5th January	310	115
6	6th January	168	14
7	7th January	226	20
8	8th January	253	37
9	9th January	294	33
10	10th January	216	46
11	11th January	244	29
12	12th January	297	32
13	13th January	328	86
14	14th January	215	38
15	15th January	254	30
16	16th January	256	27
17	17th January	311	68
18	18th January	212	39
19	19th January	234	36
20	20th January	221	43
21	21st January	259	38
22	22nd January	246	31
23	23rd January	248	17
24	24th January	229	45
25	25th January	263	34
26	26th January	258	41
27	27th January	283	22
28	28th January	256	30
29	29th January	278	47
30	30th January	251	15
31	31st January	129	64
32		7824	1241
33			
34			
35			
36			
37			
38			
39			

## Forms

HTML borrows the concept of a form to refer to different elements that allow you to collect information from visitors to your site. Whether you are adding a simple search box to your website or you need to create more complicated insurance applications, HTML forms give you a set of elements to collect data from your users.

### How Form Works?



### Form Controls

There are several types of form controls that you can use to collect information from visitors to your site.

## ADDING TEXT:

### Text input (single-line)

Used for a single line of text such as email addresses and names.



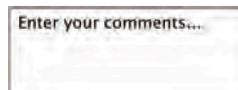
### Password input

Like a single line text box but it masks the characters entered.



### Text area (multi-line)

For longer areas of text, such as messages and comments.



## MAKING CHOICES:

### Radio buttons

For use when a user must select one of a number of options.



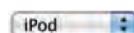
### Checkboxes

When a user can select and unselect one or more options.



### Drop-down boxes

When a user must pick one of a number of options from a list.



## SUBMITTING FORMS:

### Submit buttons

To submit data from your form to another web page.



### Image buttons

Similar to submit buttons but they allow you to use an image.

## UPLOADING FILES:

### File upload

Allows users to upload files (e.g. images) to a website.



## Form Structure

Form controls live inside a `<form>` element. This element should always carry the `action` attribute and will usually have a `method` and `id` attribute too.

### Action

Every `<form>` element requires an `action` attribute. Its value is the URL for the page on the server that will receive the information in the form when it is submitted.

### method

Forms can be sent using one of two methods: `get` or `post`.

### id

`id` attribute value is used to identify the form distinctly from other elements on the page.

### Text Input

The `<input>` element is used to create several different form controls. The value of the `type` attribute determines what kind of input they will be creating.

### type

The different input types are as follows:

```
<input type="button">
<input type="checkbox">
<input type="color">
<input type="date">
<input type="datetime-local">
<input type="email">
<input type="file">
<input type="hidden">
<input type="image">
<input type="month">
<input type="number">
<input type="password">
<input type="radio">
<input type="range">
<input type="reset">
<input type="search">
<input type="submit">
<input type="tel">
<input type="text"> (default value)
<input type="time">
<input type="url">
<input type="week">
```

### **name**

When users enter information into a form, the server needs to know which form control each piece of data was entered into. (For example, in a login form, the server needs to know what has been entered as the username and what has been given as the password.) Therefore, each form control requires a name attribute.

### **maxlength**

You can use the maxlength attribute to limit the number of characters a user may enter into the text field.

```
1 <html>
2 <head>
3     <title>form_examples</title>
4 </head>
5 <body>
6     <form action="http://www.example.com/login.php">
7         <p>Username:</p>
8             <input type="text" name="username" size="15" maxlength="30" />
9         </p>
10        <p>Password:</p>
11            <input type="password" name="password" size="15" maxlength="30" />
12        </p>
13    </form>
14
15 </body>
16 </html>
17 |
```

Username:

Password:

## Text Area

The <textarea> element is used to create a multi-line text input. Unlike other input elements this is not an empty element.

### Example

```
1 <html>
2 <head>
3     <title>form_examples</title>
4 </head>
5 <body>
6     <form action="http://www.example.com/comments.php">
7         <p>What did you think of this gig?</p>
8         <textarea name="comments" cols="20" rows="4">
9             Enter your comments...
10        </textarea>
11    </form>
12
13 </body>
14 </html>
15 |
```

What did you think of this gig?

## Radio Button

<input type="radio" Radio buttons allow users to pick just one of a number of options.

## Example

```
1 <html>
2 <head>
3     <title>form_examples</title>
4 </head>
5 <body>
6     <form action="http://www.example.com/profile.php">
7         <p>Please select your favorite genre:<br />
8             <input type="radio" name="genre" value="rock" checked="checked" /> Rock
9             <input type="radio" name="genre" value="pop" /> Pop
10            <input type="radio" name="genre" value="jazz" /> Jazz
11        </p>
12    </form>
13 </body>
14 </html>
```

Please select your favorite genre:

Rock  Pop  Jazz

## Dropdown List Box

The `<select>` element is used to create a drop down list box. It contains two or more `<option>` elements. The `name` attribute indicates the name of the form control being sent to the server, along with the value the user selected.

The `<option>` element uses the `value` attribute to indicate the value that is sent to the server along with the name of the control if this option is selected.

```
1 <html>
2     <head>
3         <title>Drop Down List Box</title>
4     </head>
5     <body>
6         <form action="http://www.example.com/profile.php">
7             <p>What device do you listen to music on?</p>
8             <select name="devices">
9                 <option value="ipod">iPod</option>
10                <option value="radio">Radio</option>
11                <option value="computer">Computer</option>
12            </select>
13        </form>
14    </body>
15 </html>
```

What device do you listen to music on?

✓ iPod  
Radio  
Computer

## Labelling Form Controls

Each form control should have its own `<label>` element as this makes the form accessible to

vision-impaired users.

The `<label>` element can be used in two ways. It can:

Wrap around both the text description and the form input (as shown on the first line of the example to your right).

Be kept separate from the form control and use the `for` attribute to indicate which form control it is a label for (as shown with the radio buttons).

```
18 <label>Age: <input type="text" name="age" /></label>
19 <br/ >
20
21 Gender:
22 <input id="female" type="radio" name="gender" value="f">
23 <label for="female">Female</label>
24
25 <input id="male" type="radio" name="gender" value="m">
26 <label for="male">Male</label>
27
28
29
```

## Grouping Form Elements

You can group related form controls together inside the `<fieldset>` element. This is particularly helpful for longer forms. Most browsers will show the fieldset with a line around the edge to show how they are related. The appearance of these lines can be adjusted using CSS. The `<legend>` element can come directly after the opening `<fieldset>` tag and contains a caption which helps identify the purpose of that group of form controls.

```
1 <html>
2   <head>
3     <title>Grouping Form Elements</title>
4   </head>
5   <body>
6     <form action="http://www.example.com/subscribe.php">
7       <fieldset>
8         <legend>Contact details</legend>
9         <label>Email:<br /><input type="text" name="email" /></label><br />
10        <label>Mobile:<br /><input type="text" name="mobile" /></label><br />
11        <label>Telephone:<br /><input type="text" name="telephone" /></label>
12      </fieldset>
13    </form>
14  </body>
15 </html>
```

Contact details

Email:	<input name="email" type="text"/>
Mobile:	<input name="mobile" type="text"/>
Telephone:	<input name="telephone" type="text"/>

## HTML 5: Elements

HTML5 introduces new form elements which make it easier for visitors to fill in forms.

- Form Validation
- Date Input

- Email & URL input
- Search Input

## DOCTYPES

Because there have been several versions of HTML, each web page should begin with a DOCTYPE declaration to tell a browser which version of HTML the page is using (although browsers usually display the page even if it is not included).

HTML5	HTML
<!DOCTYPE html>	
HTML 4	
<!DOCTYPE html PUBLIC "-//W3C//DTD HTML 4.01 Transitional//EN" "http://www.w3.org/TR/html4/loose.dtd">	
Transitional XHTML 1.0	
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN" "http://www.w3.org/TR/xhtml1/DTD/ xhtml1-transitional.dtd">	
Strict XHTML 1.0	
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Strict//EN" "http://www.w3.org/TR/xhtml1/DTD/ xhtml1-strict.dtd">	
XML Declaration	
<?xml version="1.0" ?>	

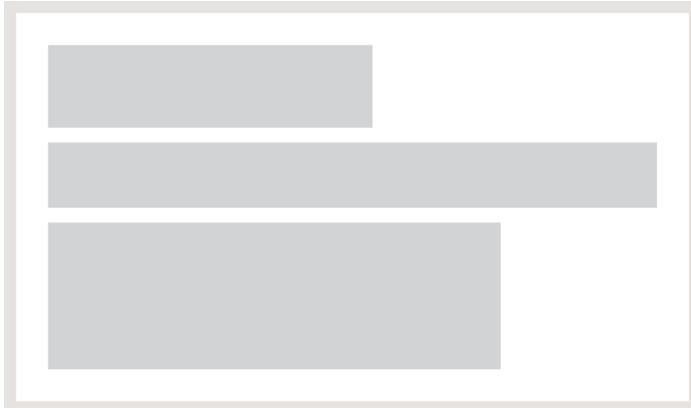
## Comments in HTML

If you want to add a comment to your code that will not be visible in the user's browser, you can add the text between these characters:

```
<!-- comment goes here -->
```

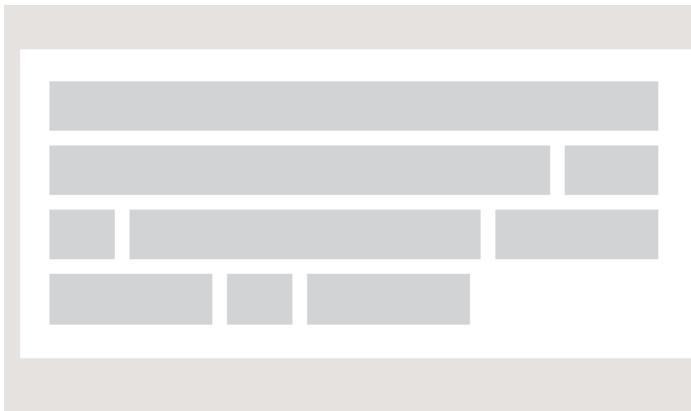
## Block Elements

Some elements will always appear to start on a new line in the browser window. These are known as block level elements. Examples of block elements are `<h1>`, `<p>`, `<ul>`, and `<li>`.



## Inline Elements

Some elements will always appear to continue on the same line as their neighbouring elements. These are known as inline elements. Examples of inline elements are `<a>`, `<b>`, `<em>`, and `<img>`.



## Grouping Text & Elements

The `<div>` element allows you to group a set of elements together in **one block-level box**. For example, you might create a `<div>` element to contain all of the elements for the header of your site (the logo and the navigation), or you might create a `<div>` element to contain comments from visitors.

In a browser, the contents of the `<div>` element will start on a new line, but other than this it will make no difference to the presentation of the page. Using an id or class attribute on the `<div>` element, however, means that you can create CSS style rules to indicate how much space the `<div>` element should occupy on the screen and change the appearance of all the elements contained within

it. It can also make it easier to follow your code if you have used <div> elements to hold each section of the page.

The <span> element acts like an inline equivalent of the <div> element. It is used to either to contain a section of text where there is no other suitable element to differentiate it from its surrounding text Or to contain a number of inline elements. The most common reason why people use <span> elements is so that they can control the appearance of the content of these elements using CSS. You will usually see that a class or id attribute is used with <span> elements.

## IFrames

An iframe is like a little window that has been cut into your page — and in that window you can see another page. The term iframe is an abbreviation of inline frame. One common use of iframes (that you may have seen on various websites) is to embed a Google Map into a page. The content of the iframe can be any html page (either located on the same server or anywhere else on the web).

An iframe is created using the <iframe> element. There are a few attributes that you will need to know to use it:

- **src:** The src attribute specifies the URL of the page to show in the frame.
- **height:** The height attribute specifies the height of the iframe in pixels.
- **width:** The width attribute specifies the width of the iframe in pixels.

```
<!DOCTYPE html>
<html>
  <head>
    <title>iFrames Continued</title>
  </head>
  <body>
    <iframe src="https://www.google.com/maps/embed?pb=!1m18!1m12!1m3!1d3308.
    4758829205657!2d71.425466514827!3d33.98030842896573!2m3!1f0!2f0!3f0!3m2!1
    i1024!2i768!4f13.1!3m3!1m2!1s0x38d9105fb03d7d69%3A0xa6e5687326894f74!2sNational
    %20University%20of%20Computer%20%26%20Emerging%20Sciences%20-%20FAST%20Peshawar
    %20Campus!5e0!3m2!1sen!2s!4v1675694951822!5m2!1sen!2s"
    width="600" height="450" style="border:0;" allowfullscreen="" loading="lazy"
    referrerPolicy="no-referrer-when-downgrade"></iframe>

  </body>
</html>
```



## Lab Tasks:

**Task 1.** Using HTML create the following table:

Quick	brown fox	jumps
	lazy	dog
over the	then	it
		fall
	prey	to a hunter

**Task 2.** Create the following HTML form.

### Registration form

Note: Form is to be completed ...

Personal Details

Name:  Address:  Email:  Phone Number:  IQ:

Gender

Male  
 Female  
 Other

Date of Birth:

Check List

Check All That Apply

check\_01  
 check\_02  
 check\_03  
 check\_04

Education

Education Level Completed:  Education Level Completed:

Essay Section

In 50 words or more explain why you want to register

Please upload contact details for 2 references

Upload Police Clearance Certificate, Bank Statement and Medical Certificates here:

**Task 3.** Incorporate Images, Tables, and Forms into your Project Site.