Department of
COMPUTER SCIENCE
HONG KONG BAPTIST UNIVERSITY

COMP7980 – Dynamic Web and Mobile Programming
COMP7270 – Web and Mobile Programming

Chapter 1 Introduction to Web Development

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Learning Objectives

- Able to create **HTML** pages using mark-up
- Able to **style HTML pages** using **CSS**.

What is HTML?

- HTML stands for **Hyper Text Markup Language**.
- It is a markup language, but **not a programming language**.
- Note that a **markup language** is a system for annotating a text in a way that is distinguishable from that text.

Tags, Elements and Attributes

- The name of the **tag** appears between the **angle brackets**, like <tag_name>.
- This is a **start tag** and the name of an **end tag** is preceded by a **forward slash**, i.e., </tag_name>

- The marked-up content between a pair of start and end tags is known as an **element**.
  - Example: <tag_name>Marked up content</tag_name>

Tags, Elements and Attributes

- **Nested element** is allowed
  - Example:

```
<parent_tag>
  <child_tag>Marked up content</child_tag>
</parent_tag>
```

- Elements can have **attributes** that appear inside the start tag and consist of one or more **name-value pairs** with format
- attribute_name="attribute_value" or attribute_name='attribute_value'

Example

```
<html>

<head>
   <title> This is a starting page </title>
</head>

<body>
   <h1 style="text-align:center"> This is a starting page </h1>
   Click <a href="http://www.comp.hkbu.edu.hk"> Here </a>
   to go to Computer Department of HKBU <br>
</body>

</html>
```

HTML Links

- Links are found in nearly all webpages.
- Links allow users to click their way from page to page.
- Links are specified in HTML using the <a> tag.
- The href attribute specifies the **destination**, which could be
  - **another document**, and/or
  - **another element** (specified by id)

HTML Links

- Examples:
  - Create a named div inside an HTML document:
    `<div id="cp3"> Chapter 3 </div>`
  - Create a link to the “Chapter 3” inside the same document:
    `<a href="#cp3"> Go to Chapter 3 </a>`
  - Or, create a link to the “Chapter 3” from another page:
    `<a href="anchor1.html#cp3"> Go to Chapter 3 </a>`

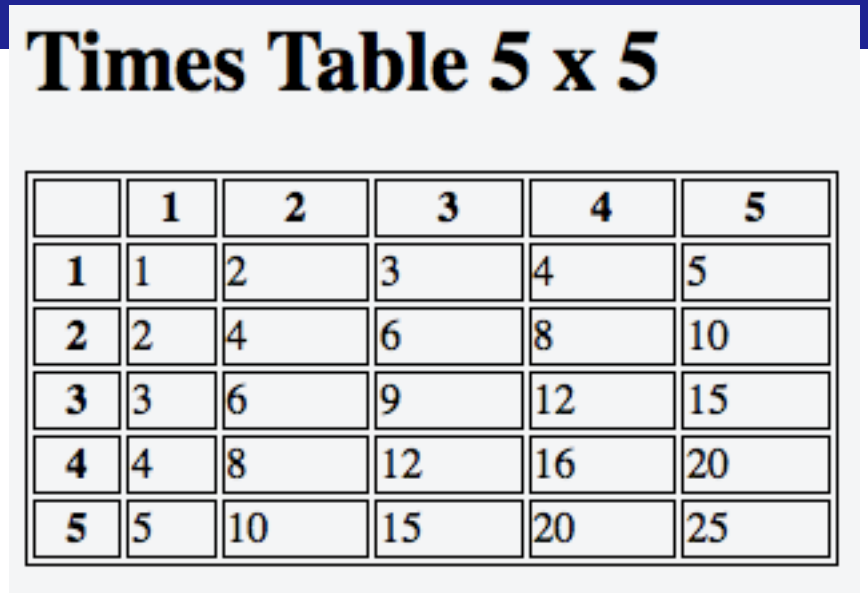
```html
<!DOCTYPE html>
<!-- anchor1.html -->
<html>
<head>
   <title>Anchor example 1</title>
</head>
<body>
   <h1>Anchor example 1: Link to the same document</h1>
   <p><a href="#cp3">Go to Chapter 3</a></p>
   <p><a href="anchor2.html">Go to Anchor example 2</a></p>
   <h2>Chapter 1</h2>
   <h2>Chapter 2</h2>
   <h2><a id="cp3">Chapter 3</a></h2>
</body>
</html>
```

```html
<!DOCTYPE html>
<!-- anchor2.html -->
<html>
<head>
 <title>Anchor example 2</title>
</head>
<body>
 <h1>Anchor example 2: Link to another document</h1>
 <a href="anchor1.html#cp3">Go to Chapter 3 of Anchor example 1</a>
</body>
</html>
```

HTML Tables

- Tables are defined with <table>tag.
- A table is divided into **rows** with <tr> tag.
- Each row is divided **data cells** with <td> tag.
- <td> tag can contain text, links, images, lists, forms, other tables, etc.
- <th> tag stands for **table header** in which text element is displayed as **bold and centered**.

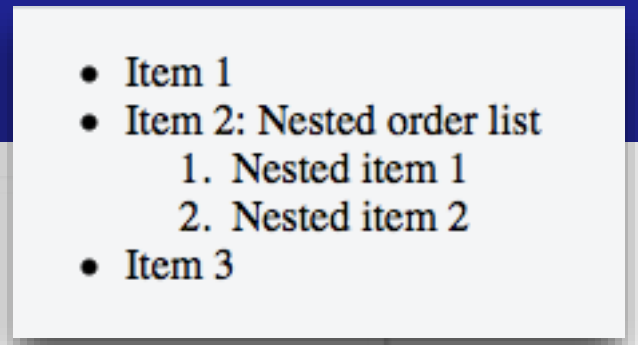
```
<!DOCTYPE html>
<html>
<head>
  <title>Times Table</title>
  <style>
    table, th, td {
      border: 1px solid black;
    }
  </style>
</head>
<body>
  <h1>Times Table 5 x 5</h1>
  <table style="width:50%">
    <tr><td></td><th>1</th><th>2</th><th>3</th><th>4</th><th>5</th></tr>
    <tr><th>1</th><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td></tr>
    <tr><th>2</th><td>2</td><td>4</td><td>6</td><td>8</td><td>10</td></tr>
    <tr><th>3</th><td>3</td><td>6</td><td>9</td><td>12</td><td>15</td></tr>
    <tr><th>4</th><td>4</td><td>8</td><td>12</td><td>16</td><td>20</td></tr>
    <tr><th>5</th><td>5</td><td>10</td><td>15</td><td>20</td><td>25</td></tr>
  </table>
</body>
</html>
```



	1	2	3	4	5
1	1	2	3	4	5
2	2	4	6	8	10
3	3	6	9	12	15
4	4	8	12	16	20
5	5	10	15	20	25

HTML Lists

- **Unordered list**
  - Defined with <ul> tag
  - Each item starts with <li> tag
- **Ordered list**
  - Defined with <ol> tag
  - Each item starts with <li> tag
- **List can be nested**




```
<!DOCTYPE html>
<html>
<head>
  <title>HTML lists</title>
</head>
<body>
  <ul>
    <li>Item 1</li>
    <li>Item 2: Nested order list
      <ol>
        <li>Nested item 1</li>
        <li>Nested item 2</li>
      </ol>
    </li>
    <li>Item 3</li>
  </ul>
</body>
</html>
```

What is CSS?

- CSS stands for **Cascading Style Sheets**
- **Styles** defined how to display HTML elements

CSS and its Benefits

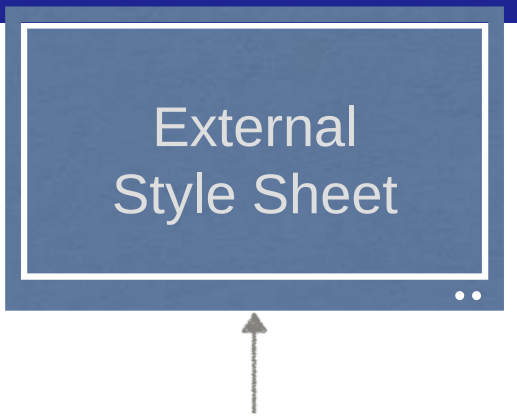
- **HTML** was intended to **define the content of a document.**
- **CSS** defines the **style and formatting**:
  - Specify display details once for any element.
  - Styles can be saved in external .css files.
  - Change presentation of all pages in **one single file**.

Where to put CSS?

- **External** style sheet
  - Style applies to many pages, each page must link with <link> tag inside the head section
- **Internal** style sheet
  - For a single document has a unique style, specified using <style> tag
- **Inline** style
  - Style tag using style attribute

CSS Linkage

- How CSS is inserted:
  - External
  - Internal
  - Inline




```
<html>
<head>
  <link rel="stylesheet" href="external.css">
  <style>
    p { color:#ff0033; }
  </style>
</head>
<body>
  <p style="color:#ff0033;"> Some text. </p>
</body>
</html>
```

CSS Syntax

- Two main parts: Selectors { declarations }

- **Selectors**
- Specify the HTML elements to be styled.
  - Multiple selectors are separated with a comma.

- **Declarations**
  - Each declaration consists of a property and a value.
  - Multiple declarations are separated with a semi-colon.
- Comment enclosed between /* and */

Matching of Selectors

Selects all elements by **element name**	p {...}
Selects all elements by **class name**	.marked {...}
Selects element by **id**	#color {...}
Specify all elements.	* {...}

Matching of Selectors

- Some CSS properties
  - background-color: specifies background color to be used.
  - color: specifies color of text.
  - text-align: specifies the horizontal alignment of text in an element
  - text-transform: controls the capitalization of text
  - text-decoration: specifies the decoration added

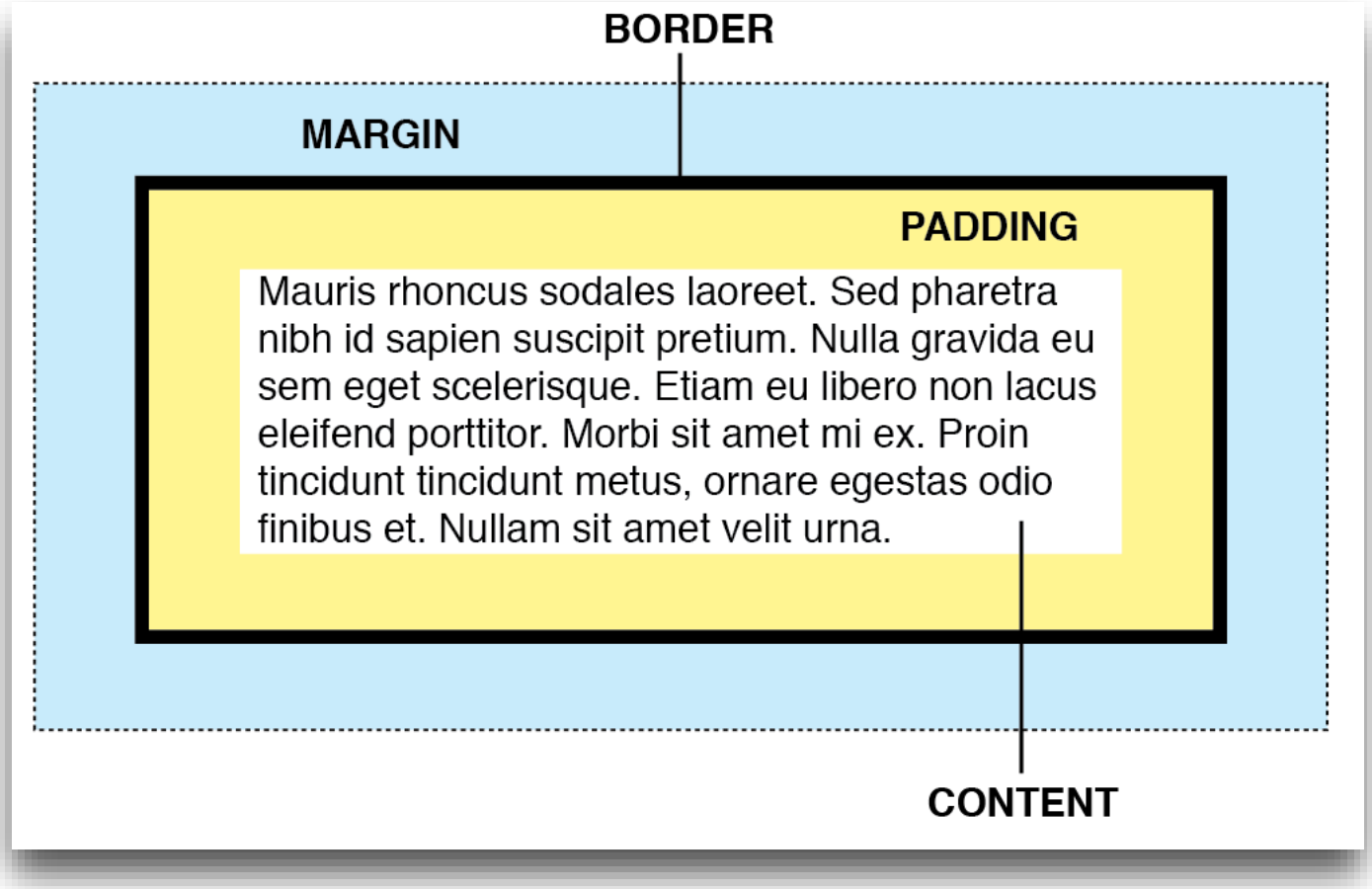
CSS Properties

- Some CSS properties, cont’
  - font-family: specifies the font for an element.
  - font-weight: sets how thick or thin characters in text should be displayed.
  - front-style: specifies the font style for a text.
  - font-size: sets the size of a font.

```
body {
   background-color: black;
   color: white;
   font-family: times, arial, serif;
}
h1 {
   text-align: center;
   text-transform: uppercase;
   text-decoration: underline;
}
h2 {
   font-weight: bold;
   font-style: oblique;
}
```

CSS Box Model

- All HTML elements can be considered as **boxes**.



CSS Box Model

- **Margin** - Clears an area around the border. The margin does not have a background color, it is completely transparent.
- **Border** - A border that goes around the padding and content. The border is affected by the background color of the box.
- **Padding** - Clears an area around the content. The padding is affected by the background color of the box.
- **Content** - The content of the box, where text and images appear.

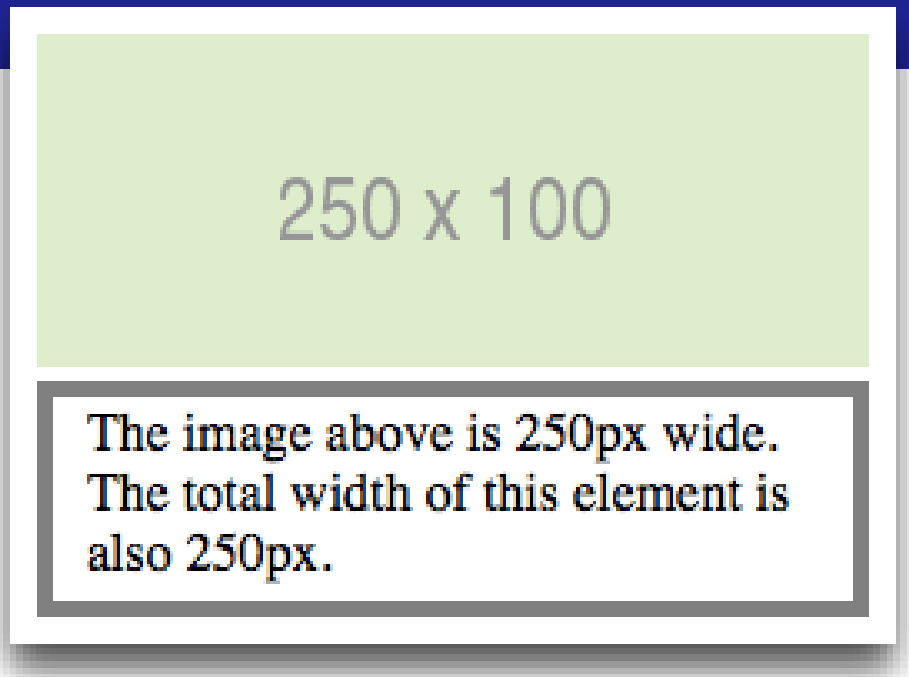
CSS Box Model

margin, padding	Example
all_four	margin: 0px;
top_and_bottom right_and_left	padding: 2px 10px;
top right_and_left bottom	padding: 2px 10px 5px;
top right bottom left	padding: 2px 10px 5px 15px;

CSS Box Model

- border
  - border-width, border-style, border-color
- Some values of **border-style**
  - none, dotted, dashed, solid, double
- Example
  - border: 5px solid gray;

```
<!DOCTYPE html>
<html>
<head>
<title>CSS box model</title>
  <style>
    .ex {
      width: 220px;
      padding: 2px 10px 5px;
      border: 5px solid gray;
      margin: 0px;
    }
  </style>
</head>
<body>
  <img src="http://via.placeholder.com/250x100/dec.png" width="250" height="100" />
  <br>
  <div class="ex">
    The image above is 250px wide.<br>
    The total width of this element is also 250px.
  </div>
</body>
</html>
```



CSS Object-fit

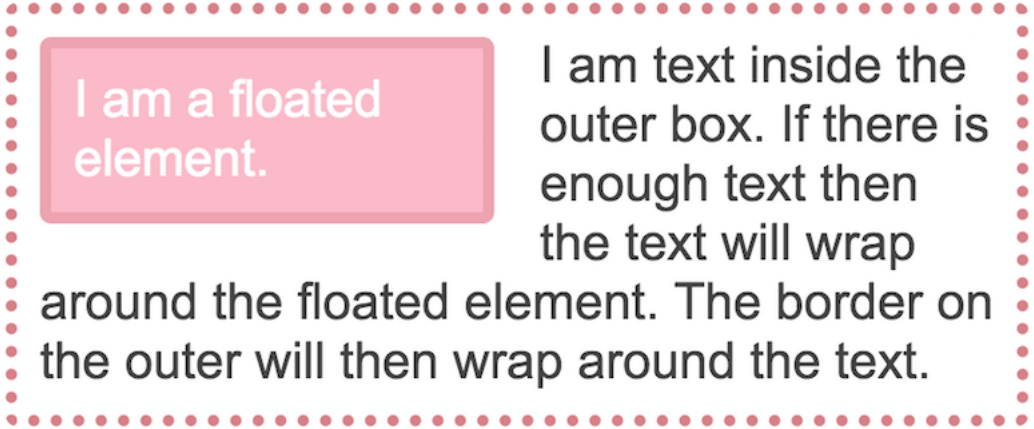
- The **object-fit** property specifies how the contents of a replaced element **should be fitted to the box** established by its used height and width.

Caption

https://www.w3.org/TR/css-images-3/#the-object-fit

Floating Elements

- A **floating element** can be pushed to the **left or right**, allowing other elements to **wrap around it**
- How elements float
  - Elements are **floated horizontally**.
  - A floating element will move as far to the left or right as it can.



Block and Inline elements of HTML

- HTML elements can be either **block** level or **inline**.
  - A **block** element is an element that takes up the **full width** available, and has a **line break** before and after it.
  - Example: <h1>, <p>,
- An **inline** element only **takes up as much width as necessary**, and **does not force line breaks**.
  - Example: , <a>, <img>

Display Property

- Changing an **inline element to a block element**, or vice versa, can be achieved using display property of CSS.
  - Example:

```
li {display:inline;} /* display li as inline element */

span {display:block;} /* display span as block element */
```

- To **hide** an element, we can set its CSS display property to none

```
span {display:none;} /* this element will not be displayed */
```

```
<!DOCTYPE html>
<html>
<head>
   <title>CSS example of display</title>
</head>
<body>
   <p>Text of <span>inline span</span>.</p>
   <p>Text of <span style="display:block">block span</span>.</p>
   <ul>
      <li>block item 1</li>
      <li style="display:inline">Inline item 2</li>
      <li style="display:inline">Inline item 3</li>
      <li style="display:none">hidden item 4</li>
      <li>block item 5</li>
   </ul>
</body>
</html>
```

Text of inline span.

Text of
block span
.

- block item 1
  Inline item 2 Inline item 3
- block item 5