

CS2204 Fundamentals of Internet Applications Development

Lecture 4 HTML – Part 3 & CSS – Part 1

Computer Science, City University of Hong Kong

Semester A 2023-24

Outline

- HTML Tags
 - More form tags
 - Additional markup
- CSS
 - Intro
 - Syntax
 - Selector

HTML: what we've learned so far (1)

Overall structure: `<head>` and `<body>`

- In `<head>` section, what are the other tags included?

Link: `<a>`

- How to open a webpage in another tab window?
- In addition to opening a webpage, what are the other actions `<a>` can do?

HTML: what we've learned so far (2)

Container: <div>

- What to do if we want to apply different styles to different sections enclosed by <div>?

Most tags work in pairs, but some do not (i.e., empty tags)

- What are some examples of empty tags?

HTML: what we've learned so far (3)

Image: ``

- Path: what are the two ways to link the image source?
- To support accessibility, what should we be mindful about?
- How to make an image a link?

List: ``, ``, `<dl>`

- How to start an ordered list from “5”?

HTML: what we've learned so far (4)

Table: <table>

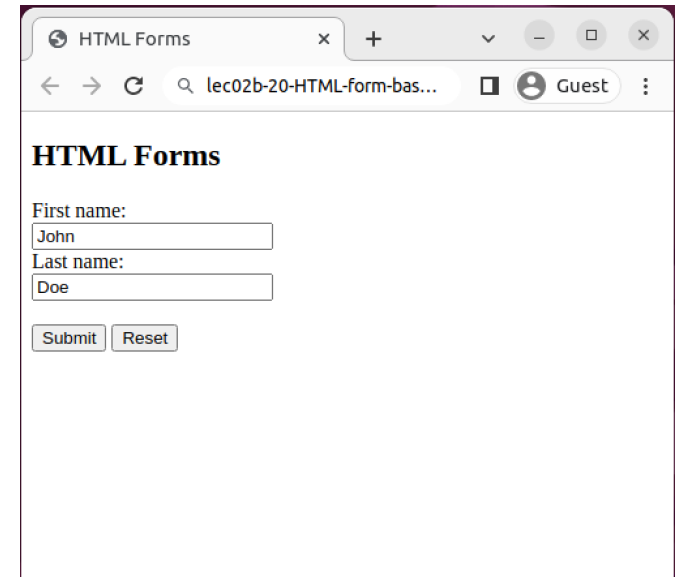
- What's the difference between <td> and <th>?
- Which tag is used to provide a short description of the table?
- How to merge table cells across rows and columns at the same time?

Form: <form>

- What are the two key attributes within the <form> tag and what are they used for?
- How to add text input area within a form?
- How to add a submission button within a form?

HTML: Form Structure

```
1 <!DOCTYPE html>
2 <html>
3   <head>
4     <title>HTML Forms</title>
5   </head>
6   <body>
7
8   <h2>HTML Forms</h2>
9
10  <form method="get" action="lec02b-23-HTML-form-script.html">
11    <label for="fname">First name:</label><br>
12    <input type="text" id="fname" name="fname" value="John"><br>
13    <label for="lname">Last name:</label><br>
14    <input type="text" id="lname" name="lname" value="Doe"><br><br>
15    <input type="submit" value="Submit">
16    <input type="reset" value="Reset">
17  </form>
18
19 </body>
20 </html>
```



The screenshot shows a web browser window with the title "HTML Forms". The address bar shows the URL "lec02b-20-HTML-form-bas...". The page content displays the rendered form with the title "HTML Forms". Below the title, there are two text input fields. The first field is labeled "First name:" and contains the text "John". The second field is labeled "Last name:" and contains the text "Doe". Below the input fields, there are two buttons: "Submit" and "Reset".

HTML: Basic Form Input Element Types

```
6 <body>
7
8 <h2>HTML Forms</h2>
9
10 <form method="get" action="lec02b-23-HTML-form-script.html">
11   <label for="fname">First name:</label><br>
12   <input type="text" id="fname" name="fname" value="John"><br>
13   <label for="lname">Last name:</label><br>
14   <input type="text" id="lname" name="lname" value="Doe"><br><br>
15
16   <p>Radio Button Example:</p>
17   <input type="radio" id="button1" name="radio_button" value="button1">
18   <label for="button1">button1</label>
19   <input type="radio" id="button2" name="radio_button" value="button2">
20   <label for="button2">button2</label>
21   <input type="radio" id="button3" name="radio_button" value="button3">
22   <label for="button3">button3</label><br><br>
23
24   <p>Check Box Example:</p>
25   <input type="checkbox" id="checkbox1" name="check_box" value="checkbox1">
26   <label for="checkbox1">checkbox1</label>
27   <input type="checkbox" id="checkbox2" name="check_box" value="checkbox2">
28   <label for="checkbox2">checkbox2</label>
29   <input type="checkbox" id="checkbox3" name="check_box" value="checkbox3">
30   <label for="checkbox3">checkbox3</label><br><br>
31
32   <label for="selectExample">Selection Example:</label><br>
33   <select id="selectExample" name="selections">
34     <option value="optionA">option A</option>
35     <option value="optionB">option B</option>
36     <option value="optionC">option C</option>
37     <option value="optionD">option D</option>
38   </select><br><br>
39
40   <label for="textinput">Input text in the text area</label><br>
41   <textarea id="textinput" name="message" rows="10" cols="30">
42     Input your text here.
43   </textarea>
44
45   <br><br>
46   <label for="pwd">Password:</label><br>
47   <input type="password" id="pwd" name="pwd"><br><br>
48
49   <input type="submit" value="Submit">
50   <input type="reset" value="Reset">
51 </form>
52
53 </body>
```

Code Example: lec04-21-HTML-form-input-element-basic.html

HTML Forms

First name:
John

Last name:
Doe

Radio Button Example:
☐ button1 ☐ button2 ☐ button3

Check Box Example:
☐ checkbox1 ☐ checkbox2 ☐ checkbox3

Selection Example:
option A

Input text in the text area
Input your text here.

Password:

Submit Reset

More Notes on Several Tags

- More **attributes** for <input>
 - *maxlength*, e.g., <input type="text" name="uname" *maxlength*="30">
 - *checked*, e.g., <input type="radio" name="rbut1" *checked*="checked">
 - *required*, e.g., <input type="password" name="pwd" *required*="required">
- More **attributes** for <select>
 - *multiple*, e.g., <select id="selection" name="ssel" *multiple*="multiple">
 - Pressing "Ctrl" (on a PC) or "command" (on a Mac) key while selecting options
- Radio button
 - Once a radio button is **checked**, it **cannot** be **unchecked**
 - If *uncheck* is needed, you can use **checkbox**

Critical Thinking

- When to use **radio buttons** and when to use **selection boxes**?

HTML: Form Input Element Types - New

```
1 <!DOCTYPE html>
2 <html>
3   <head>
4     <title>HTML Forms</title>
5   </head>
6   <body>
7
8     <h2>HTML Forms</h2>
9
10    <form method="get" action="lec02b-23-HTML-form-script.html">
11      <label for="number">Number:</label>
12      <input type="number" min="1" max="10" id="number" name="number"/><br><br>
13
14      <label for="range">Range:</label>
15      <input type="range" min="1" max="10" id="range" name="range"/><br><br>
16
17      <label for="email">Email:</label>
18      <input type="email" id="email" name="email" value="" /><br><br>
19
20      <label for="url">URL:</label>
21      <input type="url" id="url" name="url" value="" /><br><br>
22
23      <label for="date">Date:</label>
24      <input type="date" id="date" name="date" value="" /><br><br>
25
26      <input type="submit" value="Submit">
27      <input type="reset" value="Reset">
28    </form>
29
30  </body>
31 </html>
```

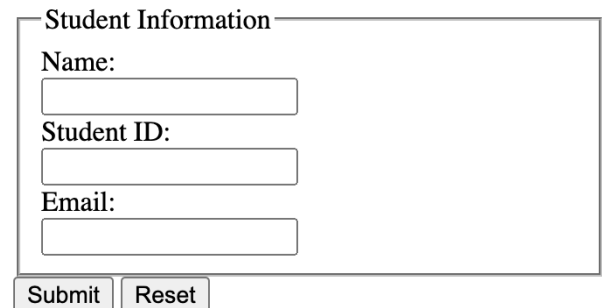
The screenshot shows a web browser window with the title "HTML Forms". The address bar shows the URL "lec02b-22-HTML-form-inp...". The page content displays the rendered form with the following elements:

- Number:** A text input field with the label "Number" to its right.
- Range:** A range slider input field with the label "Range" to its right.
- Email:** A text input field with the label "Email" to its right.
- URL:** A text input field with the label "URL" to its right.
- Date:** A date picker input field with the label "Date" to its right.
- Submit and Reset:** Two buttons labeled "Submit" and "Reset" at the bottom of the form.

Grouping Form Elements

- `<fieldset>` can group **form controls** together
 - Useful for **long forms**
 - Most browsers show **a line around the edge** of the `fieldset` element
- `<legend>` explains the **purpose** of the `fieldset` grouping
 - **Immediately after** the **opening** `<fieldset>` tag

fieldset Example



Student Information

Name:

Student ID:

Email:

```
<form method="get" action="lec04-23-HTML-form-script.html">
  <fieldset>
    <legend>Student Information</legend>
    <label for="sname">Name:</label> <br>
    <input type="text" id="sname" name="ssname"> <br>
    <label for="sid">Student ID:</label> <br>
    <input type="number" id="sid" name="ssid"> <br>
    <label for="eml">Email:</label> <br>
    <input type="email" id="eml" name="eeml">
  </fieldset>

  <input type="submit">
  <input type="reset">
</form>
```

Code Example: lec04-24-HTML-form-group.html

HTML: Query String

- What exactly is the **mechanism** for **sending the data back** to the server by the browser?
 - When the **Submit button** is clicked, the **address bar** of the browser is changed. The **URL** is appended with a **question mark** followed by a **string**
 - This is called **Query String**. All these are done automatically by the browser
- The query string consists of one or more **name-value pair(s)**
 - **Names** come from the **name attributes** in the **input tags**
 - **Values** are from the **user's input**
 - Based on this format, the server side/target page **scripts** and **extracts** the values for further processing

Code Example: lec04-23-HTML-form-script.html

HTML Forms

lec02b-23-HTML-form-script.html?fname=John&lname=Doe&radio_button=button1&check_box=checkbox1&selections=optionB...

Guest

From received

Data are received as follow from the form page:

fname=John&lname=Doe&radio_button=button1&check_box=checkbox1&selections=optionB&message=Hello&pwd=123456

Individual fields can be obtained when we learn more Javascript.

Click Submit

...html?fname=John&lname=Doe&radio_button=button1&check_box=...

HTML: Processing Details

- What is the difference in using **different methods** (get or post) to send the form?
- **Get**
 - Content of the form is sent to Web server as **part** of the **URL**
 - **Append** the form content as an **encoded query string** in the form of **name-value pairs**
 - The query string can be **seen** in the **address bar** of the browser
- **Post**
 - Content of the form is sent as part of the **message content**
 - The content **cannot** be seen in the **address bar** of the browser
 - Can send **binary data** (file upload), not just text

Critical Thinking

Within <input>, how does **id** differ from **name**?

HTML: Form Good Practice

- **Basic considerations:**

- Use **names** for **input tags** is **essential**
- Use **label** to mark **different fields**
- Use **fieldset** & **legend** to **group** elements, should not use **floating text**
- ...

- Note that `<input>` can be used outside `<form>`, a convenient way to get user input for interaction within a page, but data are not sent out
- For new input types, the format checking is provided by browser without using JavaScript. Not all browsers support all features (need to test)

Additional Markup

- A **button** can be created by using the **tag** `<button>`
 - More discussions of this tag in JavaScript

Additional Markup

- **Comments** in HTML
- **Syntax:** `<!-- -->`

```
<!-- comments in the same line -->
```

or

```
<!--  
    comments may occupy multiple lines  
    comments may occupy multiple lines  
-->
```

You can also select all the code you want to comment, and press **command/ctrl + /**

Additional Markup

- **Escape** characters
 - You want to write a character, but it is **reserved by HTML**, e.g., the left angle bracket `<`, or
 - You want to write a **special** character, e.g., `©`
 - If so, you should use the corresponding escape character
 - **Syntax:** `&codes;`

	Meaning	Escape Char.		Meaning	Escape Char.
<code><</code>	Less-than	<code>&lt;</code>	<code>×</code>	Multiplication	<code>&times;</code>
<code>></code>	Greater-than	<code>&gt;</code>	<code>÷</code>	Division	<code>&divide;</code>
<code>“</code>	Left-double quotes	<code>&ldquo;</code>		Space	<code>&nbsp;</code>
<code>”</code>	Right-double quotes	<code>&rdquo;</code>	<code>©</code>	Copyright	<code>&copy;</code>

Outline

- HTML Tags
 - More form tags
 - Additional markup
- CSS
 - Intro
 - Syntax
 - Selector

CSS

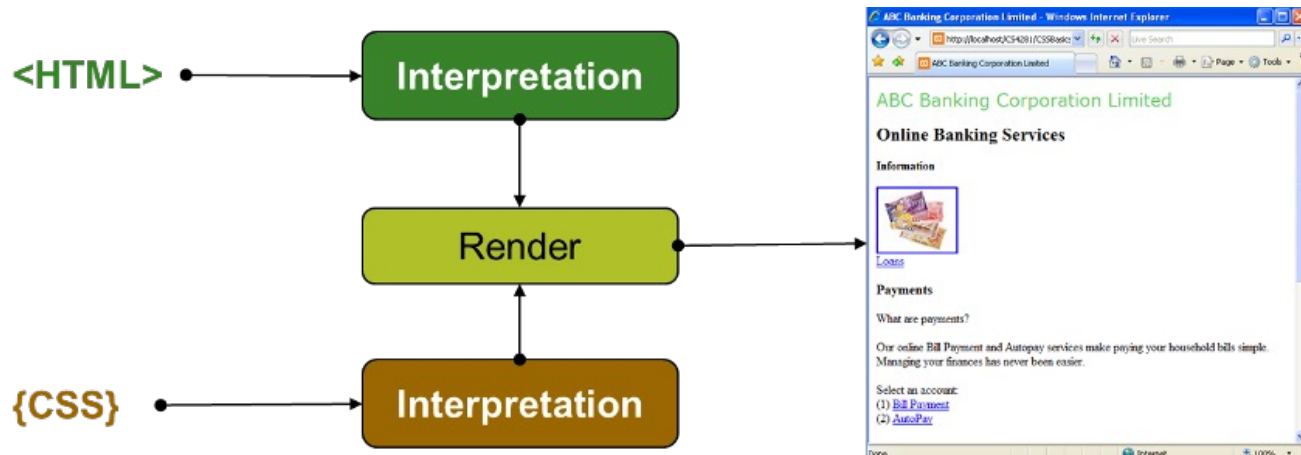
- Cascading Style Sheets (**CSS**) describes how the HTML elements should be **displayed** by specifying the **fonts**, **colors**, **layout** and **placement** of these HTML elements
- Although you could provide the same formatting and layout instructions using HTML, it is better to use CSS as a single CSS rule can be applied to multiple elements, so it saves the efforts for defining the appearance of individual HTML elements one by one. The same CSS can also be applied across webpages under the same website

Versions of CSS

- CSS Level 1 (**CSS1**), 1996
 - Simple styles for HTML elements, such as format text, set fonts, and set margins
- CSS Level 2 (**CSS2**), 1998
 - Same page, different style sheets for different media, such as visual browsers, hearing devices, printers, braille devices
- CSS Level 2 Revision 1 (**CSS 2.1**), 2006
 - Correct some errors in CSS2 errata and add a small amount of new property values
 - A stable, widely used version
- CSS Level 3 (**CSS3**), 2000
 - Chosen to work with HTML5 and in an active development
 - Many new features: web fonts, animation, transform, etc.

How Does CSS work?

- **CSS codes** can be either **embedded in** (put **directly inside**) the HTML file or **linked to it** as **style sheets**
- When a web page is requested, the server sends the HTML file first, **followed by any files embedded to or linked**, such as images and .css files
- After getting the CSS code, the browser **interprets it** and **applies the CSS style** to the HTML, and then **display the final page** in the browser window



How to Set Styles for Elements?

The basic idea

- 1) **find/select an element**
- 2) **apply styles on it**

The direct way: **inline style**

```
<h1 style="color: blue; font-size: 20pt;"> A big and blue color heading</h1>
```

But what are the problems?

How to Set Styles for Elements?

- We need a way to **select** element or elements **more efficiently** and **set styles** without mixing with HTML mark-ups. **CSS rule** is the answer
- Each rule consists of:

```
selector {  
    property1: value1;  
    property2: value2;  
    ...  
}
```

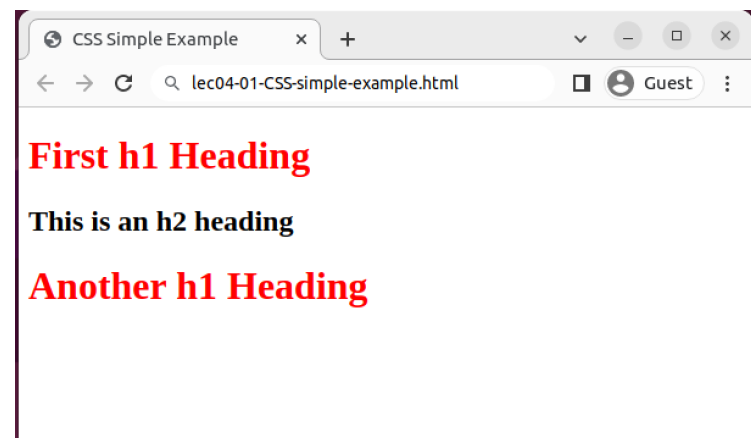
- These rules are put in either **the <head> section** or an **external file**, **NOT** mixing with HTML

Simple Example

- CSS can be embedded in the **head** section of the webpage, with the styles defined **inside** the `<style> </style>` tags

```
1 <!DOCTYPE html>
2 <html>
3 <head>
4
5   <title>CSS Simple Example</title>
6
7   <style>
8     h1 {
9       color: red;
10    }
11  </style>
12
13 </head>
14 <body>
15
16 <!-- Page content begins here -->
17
18 <h1>First h1 Heading</h1>
19
20 <h2>This is an h2 heading</h2>
21
22 <h1>Another h1 Heading</h1>
23
24 <!-- Page content ends here -->
25 </body>
26 </html>
```

This style sets all `<h1>` headings in red color



Code Example: lec04-26-CSS-simple-example.html

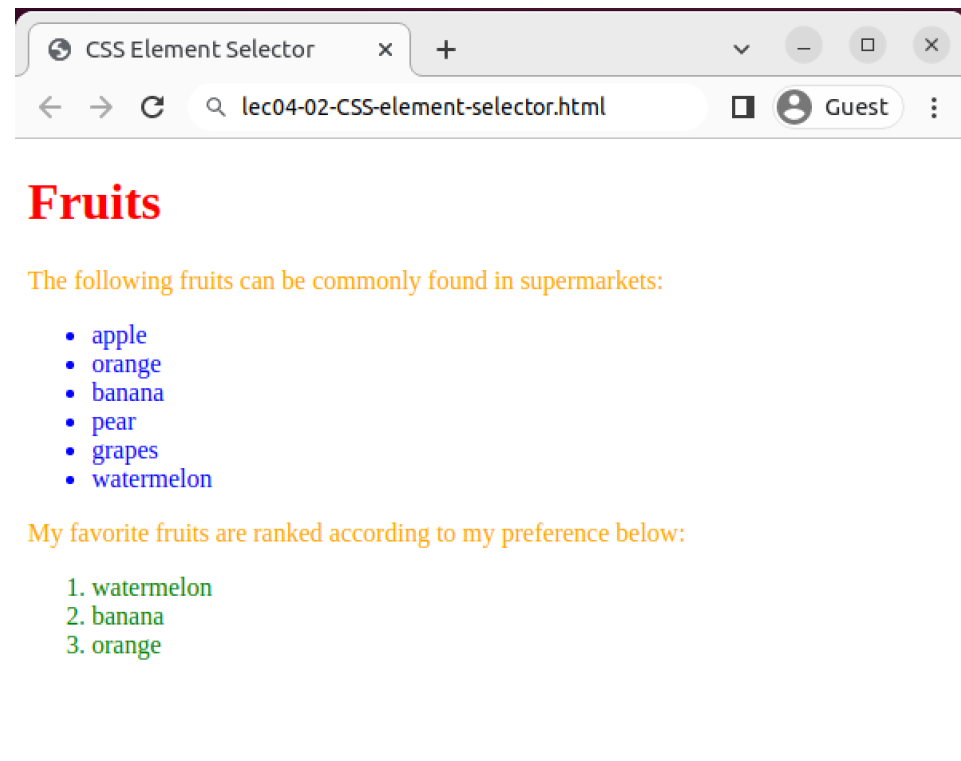
Element Selector

```
selector {  
    property1: value1;  
    property2: value2;  
    ...  
}
```

- A CSS style can be applied to **different** HTML elements by using the corresponding HTML tag as **element selector**

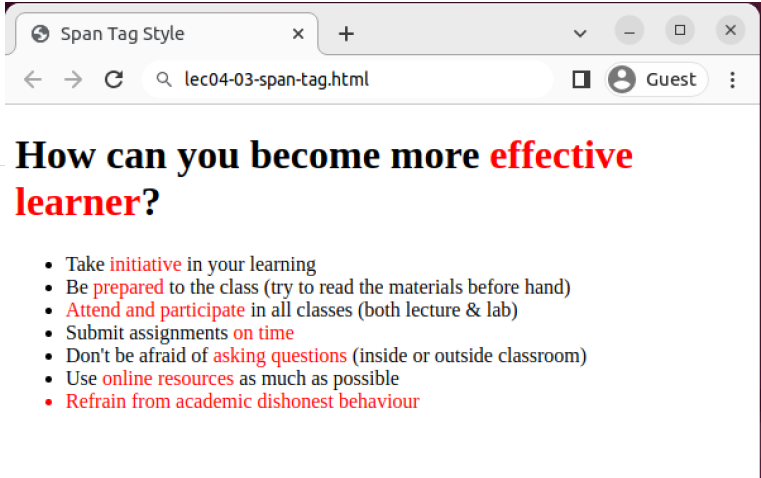
```
1 <!DOCTYPE html>  
2 <html>  
3 <head>  
4 <title>CSS Element Selector</title>  
5 <style>  
6   h1 {  
7     color: red;  
8   }  
9   ul {  
10    color: blue;  
11  }  
12   ol {  
13    color: green;  
14  }  
15   p {  
16    color: orange;  
17  }  
18 </style>  
19 </head>  
20 <body>  
21 <!-- Page content begins here -->  
22 <h1>Fruits</h1>  
23 <p>The following fruits can be commonly found in supermarkets:</p>  
24 <ul>  
25   <li>apple</li>  
26   <li>orange</li>  
27   <li>banana</li>  
28   <li>pear</li>  
29   <li>grapes</li>  
30   <li>watermelon</li>  
31 </ul>  
32 <p>My favorite fruits are ranked according to my preference below:</p>  
33 <ol>  
34   <li>watermelon</li>  
35   <li>banana</li>  
36   <li>orange</li>  
37 </ol>  
38 <!-- Page content ends here -->  
39 </body>  
40 </html>
```

Code Example: lec04-27-CSS-element-selector.html



The tag

- The **** tag can be used to enclose a **part** of the text such that the style can be applied



Span Tag Style

lec04-03-span-tag.html

Guest

How can you become more **effective learner?**

- Take **initiative** in your learning
- Be **prepared** to the class (try to read the materials before hand)
- **Attend and participate** in all classes (both lecture & lab)
- Submit assignments **on time**
- Don't be afraid of **asking questions** (inside or outside classroom)
- Use **online resources** as much as possible
- **Refrain from academic dishonest behaviour**

```
1 <!DOCTYPE html>
2 <html>
3   <head>
4     <title>Span Tag Style</title>
5     <style>
6       span {
7         color: red;
8       }
9     </style>
10  </head>
11  <body>
12    <!-- Page content begins here -->
13    <h1>How can you become more <span>effective learner</span>?</h1>
14    <ul>
15      <li>Take <span>initiative</span> in your learning</li>
16      <li>Be <span>prepared</span> to the class (try to read the materials before hand)</li>
17      <li><span>Attend and participate</span> in all classes (both lecture & lab) </li>
18      <li>Submit assignments <span>on time</span></li>
19      <li>Don't be afraid of <span>asking questions</span> (inside or outside classroom)</li>
20      <li>Use <span>online resources</span> as much as possible</li>
21      <span><li>Refrain from academic dishonest behaviour</li></span>
22    </ul>
23    <!-- Page content ends here -->
24  </body>
25 </html>
```

Code Example: lec04-28-span-tag.html

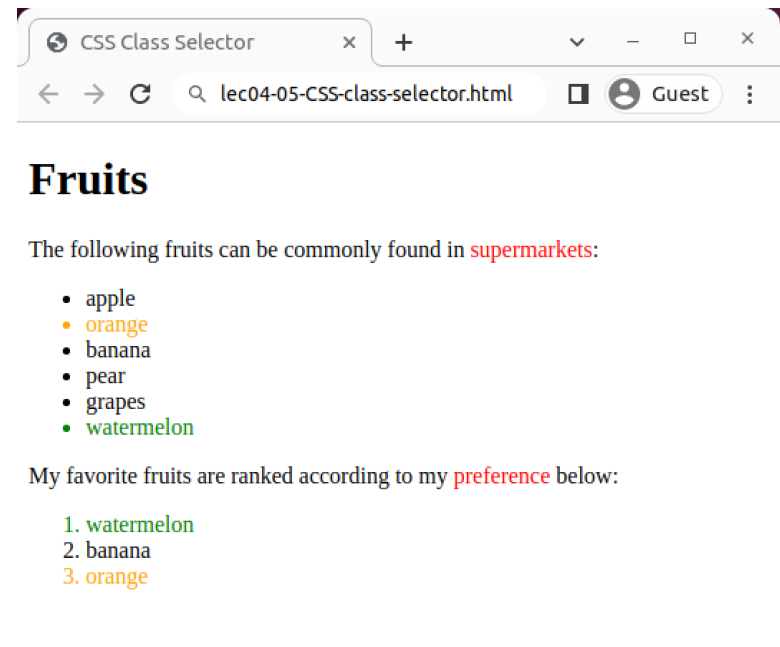
Class Selector

- A CSS style can be applied to **all** elements with the **same class name**

Code Example: lec04-29-CSS-class-selector.html

```
1 <!DOCTYPE html>
2 <html>
3 <head>
4   <title>CSS Class Selector</title>
5   <style>
6     .highlight {
7       color: red;
8     }
9     .watermelon {
10      color: green;
11    }
12     .orange {
13      color: orange;
14    }
15   </style>
16 </head>
17 <body>
18   <!-- Page content begins here -->
19   <h1>Fruits</h1>
20   <p>The following fruits can be commonly found in <span class="highlight">supermarkets</span></p>
21   <ul>
22     <li>apple</li>
23     <li class="orange">orange</li>
24     <li>banana</li>
25     <li>pear</li>
26     <li>grapes</li>
27     <li class="watermelon">watermelon</li>
28   </ul>
29   <p>My favorite fruits are ranked according to my <span class="highlight">preference</span> below:</p>
30   <ol>
31     <li class="watermelon">watermelon</li>
32     <li>banana</li>
33     <li class="orange">orange</li>
34   </ol>
35   <!-- Page content ends here -->
36 </body>
37 </html>
```

The period . followed by a class name is used to specify a class selector



Different html elements can be labeled with the same class name

CSS Font

- Useful **properties** related to fonts

- font-family, font-size, font-weight, font-style

- font-family

- specifies **font** for an element

- can hold **several font names**

- browser will check **sequentially**

```
p {  
  font-family: "Times New Roman", Times, serif;  
}
```

- font-size

- sets the **size** of a font

- **px** means **pixels**

```
body {  
  font-size: 15px;  
}
```

- font-weight

- normal | bold | bolder | lighter

- number (**no px after the number**)

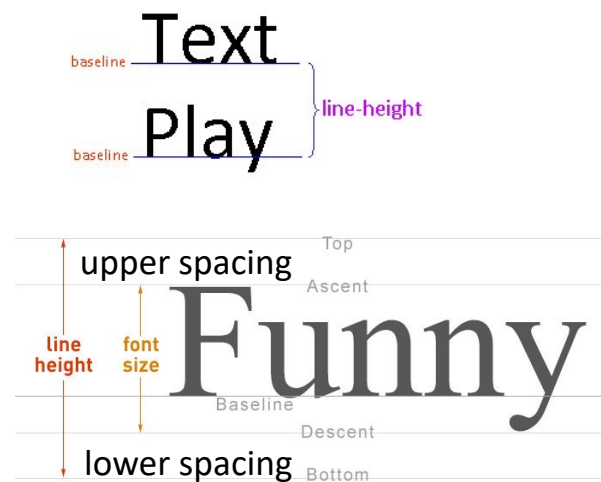
- 400 means **normal**, and 700 means **bold**

```
p {  
  font-weight: normal;  
}  
  
div {  
  font-weight: bold;  
}  
  
a {  
  font-weight: 700;  
}
```

CSS Font

- `font-style`
 - `normal` | `italic`
- `line-height`
 - specifies the **height of a line**
 - essentially changes **upper** & **lower** spacing
 - **font size** is controlled by `font-size`
- **Compound font style**
 - `font: font-style font-weight font-size/line-height font-family;`
 - `font-size` and `font-family` **must exist**; the rest is **optional**

```
li {  
  font: italic bold 12px/30px Georgia, serif;  
}  
  
a {  
  font: italic 12px/1.5 Georgia, serif;  
}  
  
p {  
  font: 12px Georgia, serif;  
}
```



CSS Font Example

```
<!DOCTYPE html>
<html lang="en">
<head>
  <meta charset="UTF-8">
  <title>CSS Font</title>
  <style>
    p {
      font-family: 'Times New Roman', Times, serif;
      line-height: 30px;
    }
    body {
      font-size: 16px;
      /* font-weight: bold; */
      font-weight: 700;
    }
    h1 {
      font-size: 16px;
      /* font-weight: normal; */
      font-weight: 400;
    }
    em {
      font-style: normal;
    }

    span {
      /* font: italic bold 20px/30px serif; */
      font: 20px serif;
    }
  </style>
</head>
<body>
  <h1>CSS Font Example</h1>

  <p>The Department of Computer Science was established in 1984, and has evolved from a
teaching-oriented department into one that excels in both teaching and research.</p>

  <p>The Department launched its first BSc in Computer Studies in 1987 (renamed and
restructured as the BSc Computer Science in 2000), followed by the MSc in Computer Science
in 1991. The Department also produced its first PhD graduate in 1994.</p>

  <em>about us</em>

  <br>
  <span>The Department of Computer Science was established in 1984, and has evolved from a
teaching-oriented department into one that excels in both teaching and research.</span>

</body>
</html>
```

CSS Font Example

The Department of Computer Science was established in 1984, and has evolved from a teaching-oriented department into one that excels in both teaching and research.

The Department launched its first BSc in Computer Studies in 1987 (renamed and restructured as the BSc Computer Science in 2000), followed by the MSc in Computer Science in 1991. The Department also produced its first PhD graduate in 1994.

about us

The Department of Computer Science was established in 1984, and has evolved from a teaching-oriented department into one that excels in both teaching and research.

CSS Text Related Properties

- `color`
 - specifies the color of text; **three** popular ways to set
 - 1) **Predefined color name**, e.g., `color: red;`
 - 2) **Hexadecimal colors** `#RRGGBB`, where all values of RR, GG and BB must be between 00 and FF, e.g., `color: #ff0000;`
 - 3) **RGB colors**, e.g., `color: rgb(255, 0, 0) | rgb(100%, 0%, 0%);`
- `text-align`
 - specifies the **horizontal** alignment of text in an element
 - `text-align: left | right | center;`
- `text-decoration`
 - `text-decoration: none | underline | line-through;`

```
a {  
  text-decoration: none;  
}
```

CSS Text Example

```
<!DOCTYPE html>
<html lang="en">
<head>
  <meta charset="UTF-8">
  <title>CSS Text Related</title>
  <style>
    .red {
      /* color: red; */
      /* color: #ff0000; */
      color: rgb(255, 0, 0);
    }

    h1 {
      text-align: center;
    }

    a {
      text-decoration: none;
    }
  </style>
</head>

<body>
  <h1>About Us</h1>
  <p class="red">The <a href="https://www.cs.cityu.edu.hk/">Department</a> of
Computer Science was established in 1984, and has evolved from a teaching-oriented
department into one that excels in both teaching and research.</p>

</body>
</html>
```

About Us

The Department of Computer Science was established in 1984, and has evolved from a teaching-oriented department into one that excels in both teaching and research.

Code Example: lec04-31-CSS-text.html

Back to the button example

How to make Button 1 green and Button 2 blue, and all the button text white?

- Property `background-color`

```
<!DOCTYPE html>
<html>
<head>

</head>
<body>

<h1>HTML Button</h1>

<button class="button button1">Button 1</button>
<button class="button button2">Button 2</button>

</body>
</html>
```

HTML Button

Button 1

Button 2

Button property: background-color

How to make Button 1 green and Button 2 blue, and all the button text white?

```
<!DOCTYPE html>
<html>
<head>
<style>
.button1 {
  background-color: #4CAF50; /* Green */
  color: white;
}
.button2 {
  background-color: #008CBA; /* Blue */
  color: white;
}
</style>
</head>
<body>

<h1>The button element - text and background with CSS</h1>

<button class="button button1">Green</button>
<button class="button button2">Blue</button>

</body>
</html>
```

Declaration block:

- Define style by **name: value**
- Separate multiple declarations by ;

CSS comment:

```
/* ... */
```

The button element - text and background with CSS

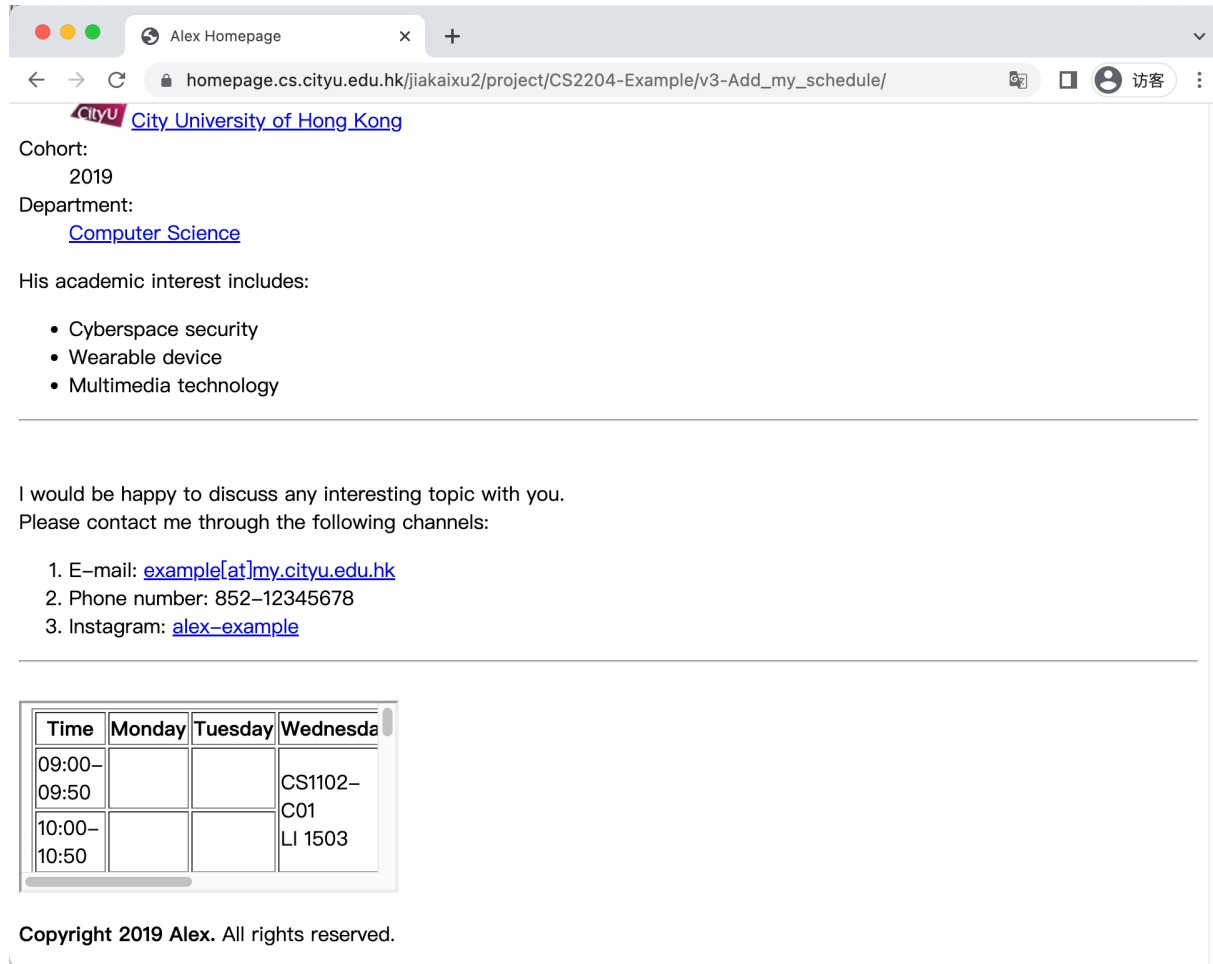
Green Blue

What are some alternative methods to set the required CSS style?

Hints:

1. set style for multiple elements at the same time
2. Leverage **multi-class name**

Personal Webpage (Version 3)



Personal Webpage (Version 3)

- **Task 1:** Create a **new file**, called “*schedule.html*”
- **Task 2:** Use the **table tag** to create your own schedule
- **Task 3:** Use **iframe** to add “*schedule.html*” to your homepage

```
<div id="schedule">  
    <iframe src="./html/schedule.html" width="500" height="400"></iframe>  
</div>
```

Time	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
09:00-09:50			CS1102-C01		CS1102-L12		
10:00-10:50			LI 1503		LI 1404		
11:00-11:50							
12:00-12:50				CS2204-C01			
13:00-13:50				YEUNG LT-2			
14:00-14:50							
15:00-15:50							
16:00-16:50							
17:00-17:50			CS2204-T06 MMW 2478				
18:00-18:50							
19:00-19:50							