

WEEK07 – HTML MARKUP LANGUAGE

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OUTLINE

- 1. HTML List & Tables**
- 2. HTML Codes & iFrame**
- 3. HTML id & class**
- 4. HTML Entities & Symbols**
5. CSS Basic Concepts
6. CSS Selector
7. MathJAX

HTML LISTS

- Ordered List: `<ol start="2"> `
 - `<ol type="1|a|A|i|I">`
- Unordered List: ` `
 - `<ul type="disc|circle|square|none">`
- Nested Lists: ` `
- Definition List: `<dl> <dt>...</dt> <dd>...</dd> </dl>`, name-value groups where 'dt' mark names and 'dd' mark values
- Horizontal List – used as menu, you can use the float style to do it

HTML TABLES

- The table started with `<table>`
- Giving a caption as `<caption>`
- Each line started with `<tr>`
- Each table head marked with `<th>`, each table data marked with `<td>`
- The attributes of `colspan` and `rowspan`
- Special styles: `tr:nth-child(even) {background-color: Gray;}` `tr:nth-child(odd) {background-color: White;}` `th {color: White; background-color: Black;}`
- Other elements: `<colgroup>`, `<col>`, `<thead>` `<tbody>` `<tfoot>`

IC_W701.html

The screenshot shows a web browser window with the title 'IC_W701.html'. The address bar shows the file path: 'file:///C:/Users/wbjia/Documents/Lecture%20Notes/2018%20(9-12)%20Introduction'. The page content is divided into four sections, each enclosed in a dashed blue box:

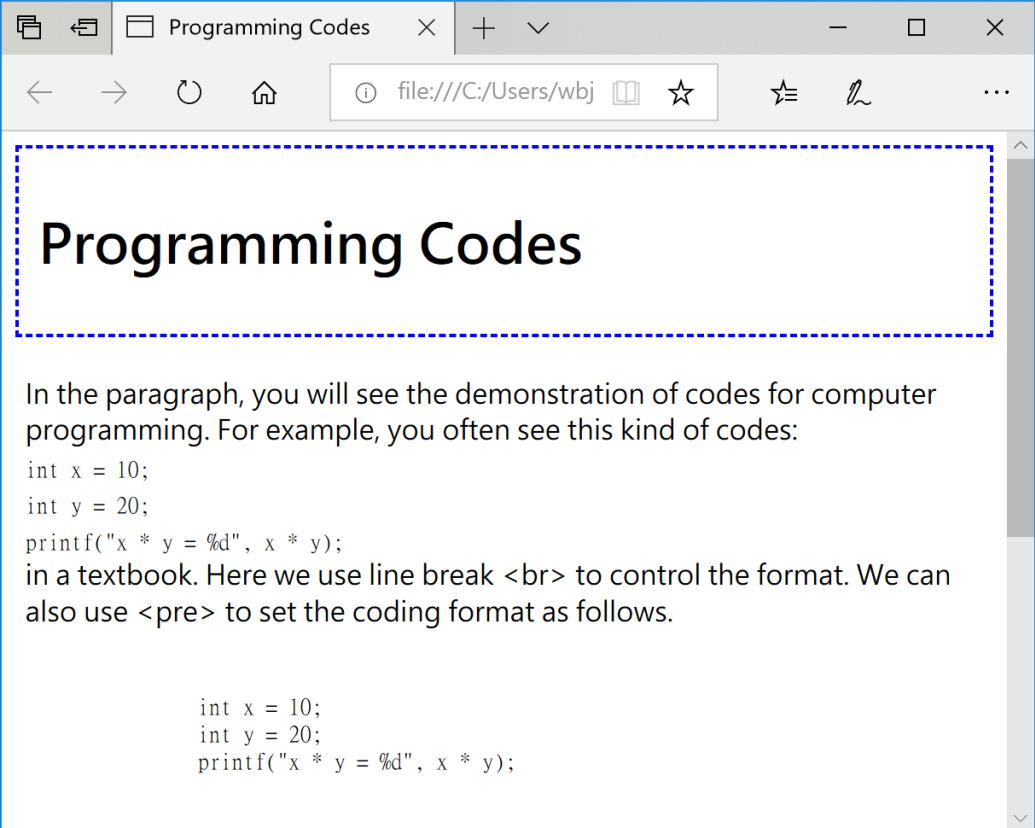
- Natural Forces**: A list of four items: i. The Gravitational Force, ii. The Electromagnetic Force, iii. The Strong Force, iv. The Weak Force.
- Natural Forces**: A list of four items: The Gravitational Force, The Electromagnetic Force, The Strong Force, The Weak Force.
- Resistor Color Code**: A list of colors and their corresponding values: Black (0), Brown (1), Red (2), Orange (3), Yellow.
- Weekly Schedule**: A table with columns for Monday, Tuesday, and Wednesday, and rows for time slots: 8AM-9AM, 9AM-10AM, 10AM-11AM, 11AM-12PM.

| | Monday | Tuesday | Wednesday |
|-----------|--------------------------|-----------------------|-----------|
| 8AM-9AM | Introduction to Computer | | |
| 9AM-10AM | | Applied Mathematics I | Physics I |
| 10AM-11AM | | | |
| 11AM-12PM | Music | | Sports |

HTML COMPUTER CODES

- Programming Codes: `<code> x = 5;
 y = 6;
 z = x + y;</code>`
- `<pre> <code> x = 42; if (x==42) printf("x is 42");</code> </pre>`
- User keyboard input: `<kbd>Ctrl + S</kbd>`
- Output from a program: `<samp> </samp>`
- Variables in programming codes: `<var>E</var> = <var>mc</var>²`

IC_W702.html



The screenshot shows a web browser window titled "IC_W702.html". The browser's address bar shows the file path "file:///C:/Users/wbj". The main content area of the browser displays the text "Programming Codes" in a large, bold font, enclosed in a blue dashed box. Below this, there is a paragraph of text: "In the paragraph, you will see the demonstration of codes for computer programming. For example, you often see this kind of codes:" followed by a code block. The code block contains the following C code:

```
int x = 10;
int y = 20;
printf("x * y = %d", x * y);
```

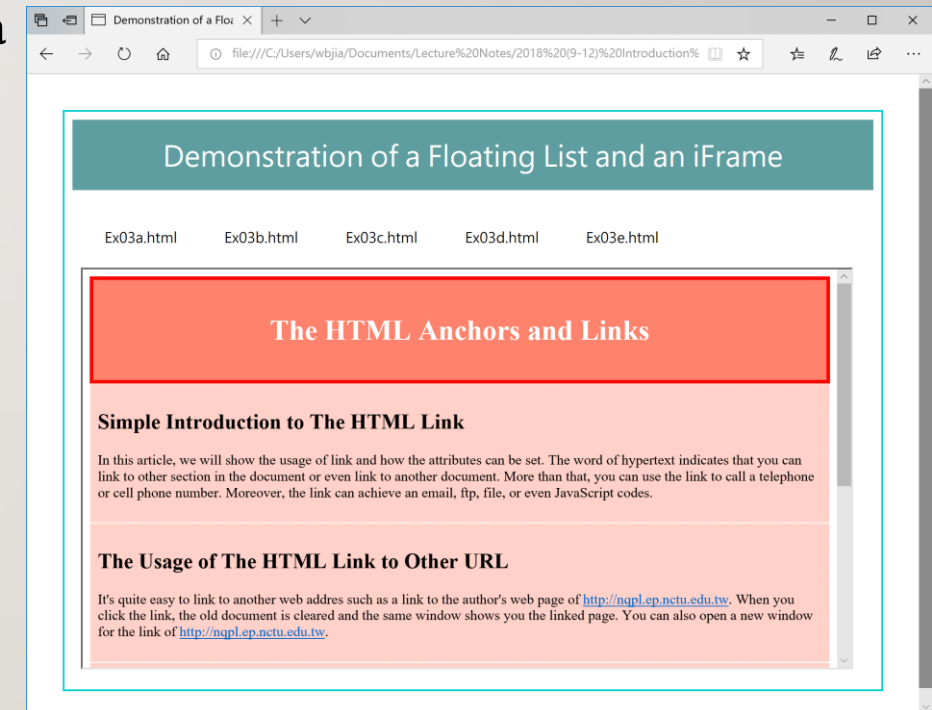
 The text continues: "in a textbook. Here we use line break
 to control the format. We can also use <pre> to set the coding format as follows." Below this, there is another code block showing the same C code with line breaks:

```
int x = 10;
int y = 20;
printf("x * y = %d", x * y);
```

HTML IFRAMES

- An iFrame is used to show another HTML document in an area with a specified size in the current document.
- Use: `<iframe src="..." width="n" height="n"></iframe>`
- Remove the border: `<iframe src="..." style="border:none;">`
- Give a name to an iFrame `<iframe src="..." name="iframe_name">`
- A link can show the content in the frame: ``

IC_W703.html



HTML ENTITIES

- Use ` ` to add real spaces to your text
- The less than symbol `<` : `<`, the symbol `>` : `>`
- The symbol `&` : `&`
- The symbol `“` : `"`, the symbol `‘` : `'`
- The symbol cent: `¢`, pound: `£`, yen: `¥`, euro: `€`
- The symbol copyright: `©`, registered trademark: `®`

HTML SYMBOLS

- Partial Differential: ∂ ; Nabla: ∇ ;
- For All: \forall ;
- There Exist: \exists ;
- Empty Set: \emptyset ;
- Element of: \in ; Not an element of: \notin ;
- N-ary product: \prod ; N-ary summation: \sum ;
- α ; β ; γ ; ϵ ; ζ ;

IC_W704.html

The screenshot shows a web browser window titled 'HTML Entities and Symbols'. The page content includes a title 'HTML Entities and Symbols' followed by two tables. The first table, titled 'Entities', lists common HTML entities like space, angle brackets, ampersand, double and single quotes, cent, pound, yen, euro, copyright, and trademark. The second table, titled 'Symbols', lists mathematical symbols for partial differential, gradient, for all, there exist, Empty Set, and element of.

| | | | | | | |
|---------|-------|---------------|---------------|-----------|-------------|-------------|
| Meaning | space | angle bracket | angle bracket | ampersand | double quot | single quot |
| Symbols | space | < | > | & | " | ' |
| Meaning | cent | pound | yen | euro | copyright | tradem. |
| Symbols | ¢ | £ | ¥ | € | © | ® |

| | | | | | | |
|---------|----------------------|----------|-----------|-------------|-------------|------------|
| Meaning | partial differential | gradient | for all | there exist | Empty Set | element of |
| Symbols | ∂ | ∇ | \forall | \exists | \emptyset | \in |

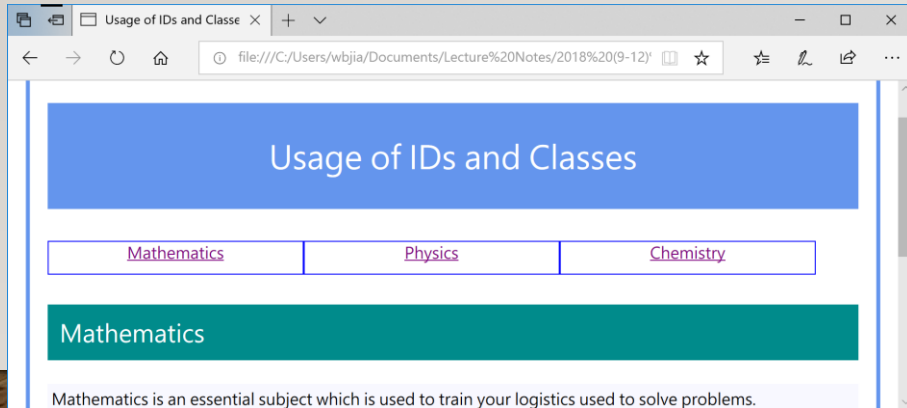
HTML ID & CLASSES

- The unique identity – id – in an HTML document: `<element id="name">`
- Use the element, e. g. style: `<style> #name { color: black; ... } </style>`
- The id value is case sensitive.
- The class – class – in an HTML document can be used by several elements (a group of elements): `<element class="class_name">`
- Set the style for the group of the elements: `<style> .class_name { color: black; ...} </style>`
- Link to the element with an id: ``

使用id證號選擇

使用類別class選擇

IC_W705.html



OUTLINE

1. HTML List & Tables
2. HTML Codes & iFrame
3. HTML id & class
4. HTML Entities & Symbols
- 5. CSS Basic Concepts**
- 6. CSS Selector**
- 7. MathJAX**

CSS BASIC CONCEPTS

- Usage: selector {attribute1: value1; attribute2: value2;}
- For example: p {font-size: 10px; color: blue;}
- The same effect while working on one tag: <p style="font-size: 10px; color: blue;"> </p>
- The style <style> descriptions are usually put in the <head>.
- You put style in a file and use it by <link rel="stylesheet" href="css_file_name" type="text/css">
- css unit: px – pixel, pt – (72 dpi, dots per inch), em – default font size, % - ratio to current font-size or window size, in – inch, cm – centimeter, mm – millimeter

CSS SELECTOR

- Name of tag: p, div, table, ... select all containers of the same tag name
- Nested selection: `<div><p></p></div>` → selector: `div p {color: red;}`
- Grouped selection: `div, p {color: red;}`
- Class selection: `.impt {color: red; font-weight: bold;}`
 - Using class: `<p class="impt"></p> <div class="impt"></div>`
- ID selection: `#john {color: blue; font-size: 16px;}`
 - Using ID: `<p id="john"></p>`

使用類別class選擇

使用id證號選擇

CSS LEVEL I SELECTOR

使用類別class選擇

- .class

使用id證號選擇

- #id

聯集選擇

- tag name – element

使用element(tag name)標籤選擇

- element, element

element element

巢狀式選擇

- :first-letter :first-line

Ex: p:first-letter{color: red; font-size: 120%;}

- :link :visited

- :active :hover Ex: a:hover{color: white; background-color: deepblue;}

INTRODUCTION TO MATHJAX & LATEX

- Writing mathematical equations on your web pages
 - Latex language, an easy way to prepare your thesis
 - Latex is html tags while it express equations in a special format - $\left[\right]$, α , e^x , $e^{\{x+x^2\}}$
- MathJAX supports the formats of 1. Latex, 2. MathML, 3. AsciiMath.
- Start with including library:
- For $|E|$, add one more line:
- In-line math: $\left(\text{math exp} \right)$
- Block math: $\left[\text{math exp} \right]$ or $$$$

Example of using MathJAX

Here we demonstrate how to use Latex format with MathJAX Javascript libraries.

You can turn on the in-line MathJAX expression such as expressing an equation $\int_0^1 x^3 dx = \frac{1}{3}$ in your paragraph. When the MathJAX Javascript libraries are loaded, your latex format of `\int_0^1 x^3 dx = \frac{1}{3}` will be asynchronously interpreted and displayed in line in this paragraph. You probably will experience a delay of mathematical display. In addition to show math in line, you can also show math in a separated block. An example is exhibited in the following.

$$\begin{aligned} \int_0^1 \sin(x^2) 2x dx &= \int_0^{\sqrt{\pi/2}} \frac{1}{2} \sin(x^2) d(x^2) \\ &= \int_0^{\sqrt{\pi/2}} \frac{1}{2} d(-\cos(x^2)) \\ &= \left[\frac{-\cos(x^2)}{2} \right]_{x=0}^{x=\sqrt{\pi/2}} \\ &= -\frac{1}{2}(0 - 1) \\ &= \frac{1}{2} \end{aligned}$$

$$\begin{vmatrix} 1 & 2 & 3 \\ 2 & 2 & 1 \\ 1 & 3 & 5 \end{vmatrix}$$

```
<script type="text/javascript" id="Mathjax-script" async
  src="https://cdn.jsdelivr.net/npm/mathjax@3/es5/tex-mml-cthtml.js">
</script>
```

```
<script src="https://polyfill.io/v3/polyfill.min.js?features=es6"></script>
```

LATEX FORMAT FOR MATH EXPRESSIONS

- Exponents and indices: $x^2, x_1 \rightarrow x^2$ or x^{2}, x_1
- Use braces to include one more characters: $e^{x^{2+i}-2y_{0|23}}$
- Fractions: $\frac{a}{2} \rightarrow \frac{a}{2}$
- Roots: $\sqrt[n]{x^2 + 1} \rightarrow \sqrt[n]{x^2+1}$
- Sums: $\sum_{i=0}^{10} i = 55 \rightarrow \sum_{i=0}^{10} i=55$
- Integrals: $\int_0^1 x dx \rightarrow \int_0^1 x dx; \int \limits_0^1 x dx; \oint x dx \rightarrow \oint x dx$
- Limit: $\lim_{x \rightarrow 0} \frac{x}{\sin(x)} = 1 \rightarrow \lim_{x \rightarrow 0} \frac{x}{\sin x} = 1$

LATEX FORMAT FOR MATH EXPRESSIONS

- dot \rightarrow `\cdot`; \times \rightarrow `\times`; \pm \rightarrow `\pm`; \hbar \rightarrow `\hbar`; ∂ \rightarrow `\partial`; ∇ \rightarrow `\nabla`
- ... \rightarrow `\cdots`; `\vdots`; `\ddots`; `\ldots`
- Greek letters: `\alpha`, `\beta`, `\gamma`, `\theta`, `\phi`, `\delta`, `\epsilon`, `\eta`, `\pi`, `\lambda`
- Greek letters: `\Gamma`, `\Omega`, `\Psi`, `\Phi`, `\Theta`
- Relations: `\leq`, `\geq`, `\sim`, `\simeq`, `\approx`, `\not<`, `\not>`, `\not=`
- `\sin`, `\cos`, `\tan`, `\ln`, `\log`, `\sinh`, `\arcsin`
- Numbered equations: `\[... \tag{1} \]`
- `\begin{eqnarray} (x+1)^2 &=& (x+1)(x+1) \\ &\|& &=& x^2+2x+1 \end{eqnarray}`

LATEX FORMAT FOR MATH EXPRESSIONS

- Accents: \hat{a} , \vec{a} , \dot{a} , \ddot{a} , \bar{a}
- Matrix: $\begin{matrix} A & B \\ C & D \end{matrix} \rightarrow \begin{matrix} A & B \\ C & D \end{matrix}$
- Bmatrix: $\begin{bmatrix} A & B \\ C & D \end{bmatrix} \rightarrow \begin{bmatrix} A & B \\ C & D \end{bmatrix}$
 - $\begin{bmatrix} 1 & 2 & 3 \\ 2 & 2 & 1 \\ 1 & 3 & 5 \end{bmatrix}$
- Vmatrix: $\begin{vmatrix} A & B \\ C & D \end{vmatrix} \rightarrow \begin{vmatrix} A & B \\ C & D \end{vmatrix}$
- Pmatrix: $\begin{pmatrix} A & B \\ C & D \end{pmatrix} \rightarrow \begin{pmatrix} A & B \\ C & D \end{pmatrix}$

Parentheses, brackets, braces:

$\left\{, \right\}, \left[, \right], \left(, \right)$

EXERCISE

1. Please use MathJAX to present how you calculate the integration of $V =$

$$\int_0^R \int_0^\pi \int_0^{2\pi} r^2 \sin \theta \, d\phi d\theta dr$$

2. Please use MathJAX to present how you answer the question of $I =$

$$\int_{-c/2}^{c/2} \int_{-b/2}^{b/2} \int_{-a/2}^{a/2} (x^2 + y^2) \rho dx dy dz$$

3. Please use MathJAX to show how you apply matrix (Gaussian elimination) to solve the problem: Solve the system of equations: $x - y - z = 2$, $3x - 3y + 2z = 16$, $2x - y + z = 9$.

4. Compute the determinant of $A = \begin{bmatrix} 2 & -3 & 0 & 1 \\ 5 & 4 & 2 & 0 \\ 1 & -1 & 0 & 3 \\ -2 & 1 & 0 & 0 \end{bmatrix}$ and use MathJAX to present all detail calculations.