


Web Programming 05 / 08

- * Responsive Web Design (RWD)
- * CSS flexbox
- * Bootstrap UI Framework
- * Other UI Frameworks





Responsive Web Design (RWD)

New York, NY

Tuesday, April 15th
Overcast

 **58** °F

Precipitation: 100%
Humidity: 97%
Wind: 4 mph SW
Pollen Count: 36

Today		68° 36°	Pollen 36
Wednesday		50° 39°	Pollen 36
Thursday		55° 39°	Pollen 36
Friday		54° 43°	Pollen 36

Responsive Web Design (RWD)

- ◆ 簡單的說，就是隨著瀏覽器放大、縮小，或者是在不同的載具上面 (PC, notebook, cell phone, pad)，你的網頁排版都不應該爛掉！
 - ◆ 區塊重新排版、文字自動換行，圖片自動放大縮小, etc
- ◆ 都到 2018 年了，如果你做的網頁沒有考慮 RWD, 會被認為很遜...
 - ◆ 台灣大學：<http://www.ntu.edu.tw/>
 - ◆ 建國中學：<http://web.ck.tp.edu.tw/web2007/index.php>

RWD — Getting Started

◆ Edit an “index.html” —

```
<!DOCTYPE html>
<html lang="en">
  <head>
    <meta charset="utf-8">
    <style>
      body { text-align: center; }
    </style>
  </head>
  <body>
    <h3> Love </h3>
    <p>
      Love is real, real is love <br>
      Love is feeling, feeling love<br>
      Love is wanting to be loved<br>
    <br>
```

```
Love is touch, touch is love<br>
Love is reaching, reaching love<br>
Love is asking to be loved<br>
<br>
Love is you<br>
You and me<br>
Love is knowing<br>
we can be<br>
<br>
Love is free, free is love<br>
Love is living, living love<br>
Love is needing to be loved<br>
<br>
<p> by <em> John Lennon </em> </p>
</body>
</html>
```


RWD — Getting Started

- ◆ To start an RWD design, you need to first include a meta viewport tag in the head of the document.
 - ◆ `<meta name="viewport" content="width=device-width, initial-scale=1">`
 - ▶ Include `width=device-width` to match the screen's width in device-independent pixels.
 - ▶ Include `initial-scale=1` to establish a 1:1 relationship between CSS pixels and device-independent pixels.

RWD — Getting Started

- ◆ **Media queries** allow the page to use different CSS style rules based on characteristics of the device the site is being displayed on, most commonly the width of the browser.
- ◆ The **fluid grid** concept calls for page element sizing to be in relative units like percentages, rather than absolute units like pixels or points.
- ◆ **Flexible images** are also sized in relative units, so as to prevent them from displaying outside their containing element.

Ref: https://en.wikipedia.org/wiki/Responsive_web_design

RWD — @media queries

```
@media (query) {  
    /* CSS Rules used when query matches */  
}
```

Try it yourself!!

min-width	Rules applied for any browser width greater than the value defined in the query.
max-width	Rules applied for any browser width less than the value defined in the query.
min-height	Rules applied for any browser height greater than the value defined in the query.
max-height	Rules applied for any browser height less than the value defined in the query.
orientation=portrait	Rules applied for any browser where the height is greater than or equal to the width.
orientation=landscape	Rules for any browser where the width is greater than the height.

RWD — flexbox

- ◆ “flexbox” module 技術是用來協助網頁設計者簡易的控制網頁的版面配置
 - ▶ By controlling the layout, distribution, alignment... etc. of different building “blocks” in the website
- ◆ Example: <http://weenudge.com/>
- ◆ To start using “flexbox”, in html <head> —

```
<style>
  .box {
    display: flex;
  }
```


Flexbox Practices

1. Carefully design your layout in a fluid box view
 - ◆ RWD 網頁設計模式
2. Properly define classes for each boxes https://developer.mozilla.org/en-US/docs/Web/CSS/CSS_Flexible_Box_Layout/Basic_Concepts_of_Flexbox
3. For each class/element, define its flexbox properties
 - ▶ https://developer.mozilla.org/en-US/docs/Web/CSS/CSS_Flexible_Box_Layout/Basic_Concepts_of_Flexbox

Ref: <https://developers.google.com/web/fundamentals/design-and-ux/responsive/?hl=en>

Flexbox Practices — take #1

```
<div class="box">
  <canvas class="one">One
</canvas>
  <canvas class="two">Two
</canvas>
  <canvas class="three">Three
</canvas>
</div>
<div class="box">
  <canvas class="one">Four
</canvas>
  <canvas class="two">Five
</canvas>
</div>
```

```
.one {
  height: 300px;
  width: 200px;
  background-color: Tomato;
  border: 2px dotted;
}
.two {
  height: 300px;
  width: 200px;
  background-color: DodgerBlue;
  border: 2px dotted;
}
.three {
  height: 300px;
  width: 200px;
  background-color: Violet;
  border: 2px dotted;
}
```


What are the problems?

- ◆ The boxes do not wrap when the window shrinks
 - ◆ (Parent box property) `flex-wrap: wrap;`
- ◆ The spaces are not filled
 - ◆ Use `%` instead of `px`
 - ◆ (Child box properties)
`flex-grow: <a number>;`
`flex-shrink: <a number>;`
`flex-basis: auto | #pixels... etc`
e.g. `flex: 1 2 auto`
 - ◆ Shorthand for above properties
e.g. `flex: 1`

Ref: https://developer.mozilla.org/en-US/docs/Web/CSS/CSS_Flexible_Box_Layout/Basic_Concepts_of_Flexbox

What are the problems?

- ◆ The display ratio should fit the window sizes (i.e. We want to boxes to maintain certain displayed sizes)
 - ◆ `@media (query) { ...}`
==> Either define different flex controls for different window sizes, or define different .css files and use `<link>` to refer
- ◆ The control is kind of low-level, is there any UI framework that provides well-defined templates and useful modules?

Bootstrap UI Framework



Bootstrap UI Framework

- ◆ 由 Twitter 的 Mark Otto 和 Jacob Thornton 編寫
- ◆ 用於網站和網路應用程式開發的開源前端框架，包括HTML、CSS及JavaScript的框架，提供字體排印、表單、按鈕、導航及其他各種元件及Javascript擴充套件，旨在使動態網頁和Web應用的開發更加容易
- ◆ Bootstrap是GitHub上面被「Starred」次數排名第二最多的專案。Starred次數超過105,000，而分支次數超過了47,000次。
- ◆ 除了基本HTML元素，Bootstrap還包括了其他常用的介面元素，以及利用 CSS 設計了一套獨特的、現代化的樣式
- ◆ 此外，通過 jQuery，Bootstrap 加入了一些 JavaScript 互動元件

Ref: <https://zh.wikipedia.org/wiki/Bootstrap>

Bootstrap — How to start?

```
<!doctype html>
<html lang="en">
  <head>
    <!-- Required meta tags -->
    <meta charset="utf-8">
    <meta name="viewport" content="width=device-width, initial-
scale=1, shrink-to-fit=no">
    <!-- Bootstrap CSS -->
    <link rel="stylesheet" href="https://stackpath.bootstrapcdn.com/
bootstrap/4.1.1/css/bootstrap.min.css" integrity="sha384-
WskhaSGFgHYWDcbwN70/dfYBj47jz9qbsMIId/
iRN3ewGhXQFZCSftd1LZCfmhktB" crossorigin="anonymous">
  </head>
```

Ref: <http://getbootstrap.com/docs/4.1/getting-started/introduction/>

Bootstrap — How to start?

```
<body>
<!-- jQuery first, then Popper.js, then Bootstrap JS -->
<script src="https://code.jquery.com/jquery-3.3.1.slim.min.js"
integrity="sha384-q8i/X+965DzO0rT7abK41JStQIAqVgRVzpbzo5smXKp4YfRvH
+8abtTE1Pi6jizo" crossorigin="anonymous"></script>
<script src="https://cdnjs.cloudflare.com/ajax/libs/popper.js/1.14.3/umd/
popper.min.js" integrity="sha384-ZMP7rVo3mIykV
+2+9J3UJ46jBk0WLaUAdn689aCwoqbbJiSnjAK/18WvCWPIpM49"
crossorigin="anonymous"></script>
<script src="https://stackpath.bootstrapcdn.com/bootstrap/4.1.1/js/
bootstrap.min.js" integrity="sha384-smHYKdLADwkXOn1EmN1qk/
HfnUcbVRZyYmZ4qpPea6sjB/pTJ0euyQp0Mk8ck+5T"
crossorigin="anonymous"></script>
</body>
```

Ref: <http://getbootstrap.com/docs/4.1/getting-started/introduction/>

Bootstrap — Grid-based Layout

- ◆ **container | container-fluid**
— The most basic layout element class
 - ◆ `<div class="container">`
- ◆ Responsive break points — xs, sm, md, lg, xl (see the table in next page)
 - ◆ `<div class="container">`
 - `<div class="row">`
 - `<div class="col-sm"> One of three columns </div>`
 - `<div class="col-sm"> One of three columns </div>`
 - `<div class="col-sm"> One of three columns </div>`
 - `</div>`
 - `</div>`

Ref: <http://getbootstrap.com/docs/4.1/layout/grid/>

Bootstrap — Grid-based Layout

	Extra small <576px	Small ≥576px	Medium ≥768px	Large ≥992px	Extra large ≥1200px
Max container width	None (auto)	540px	720px	960px	1140px
Class prefix	.col-	.col-sm-	.col-md-	.col-lg-	.col-xl-
# of columns	12				
Gutter width	30px (15px on each side of a column)				
Nestable	Yes				
Column ordering	Yes				

Ref: <http://getbootstrap.com/docs/4.1/layout/grid/>

Bootstrap — Layout and Utilities

- ◆ More grid-based layout examples on:
<http://getbootstrap.com/docs/4.1/layout/grid/>
- ◆ Bootstrap includes many useful, gracefully designed components with interactive utilities
 - ◆ Interactions are through jQuery on JavaScript
- ◆ jQuery tutorial:
<https://www.w3schools.com/jquery/default.asp>

Other popular UI frameworks

◆ 34 best UI frameworks as of 2018

