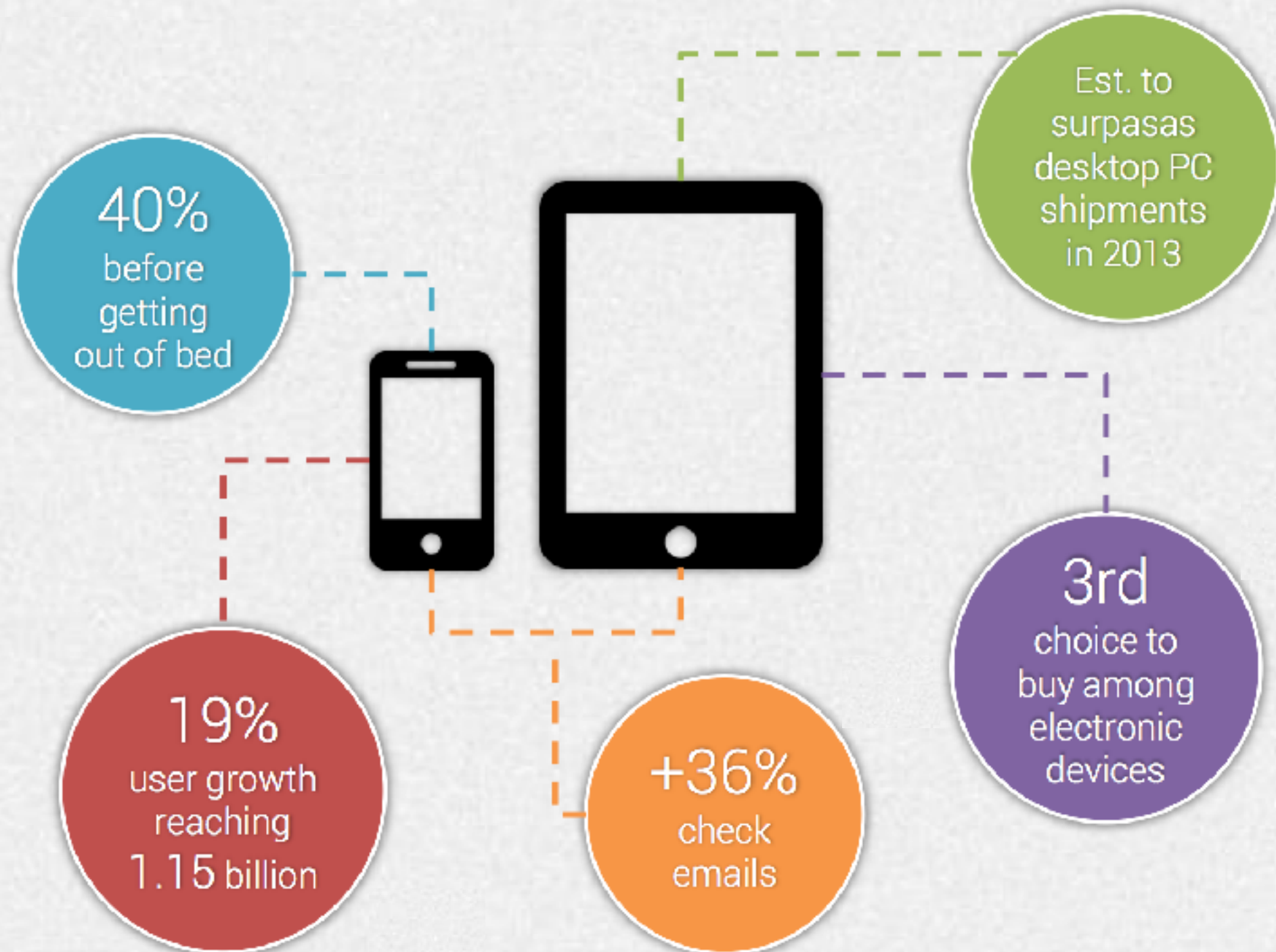


Responsive Web Design

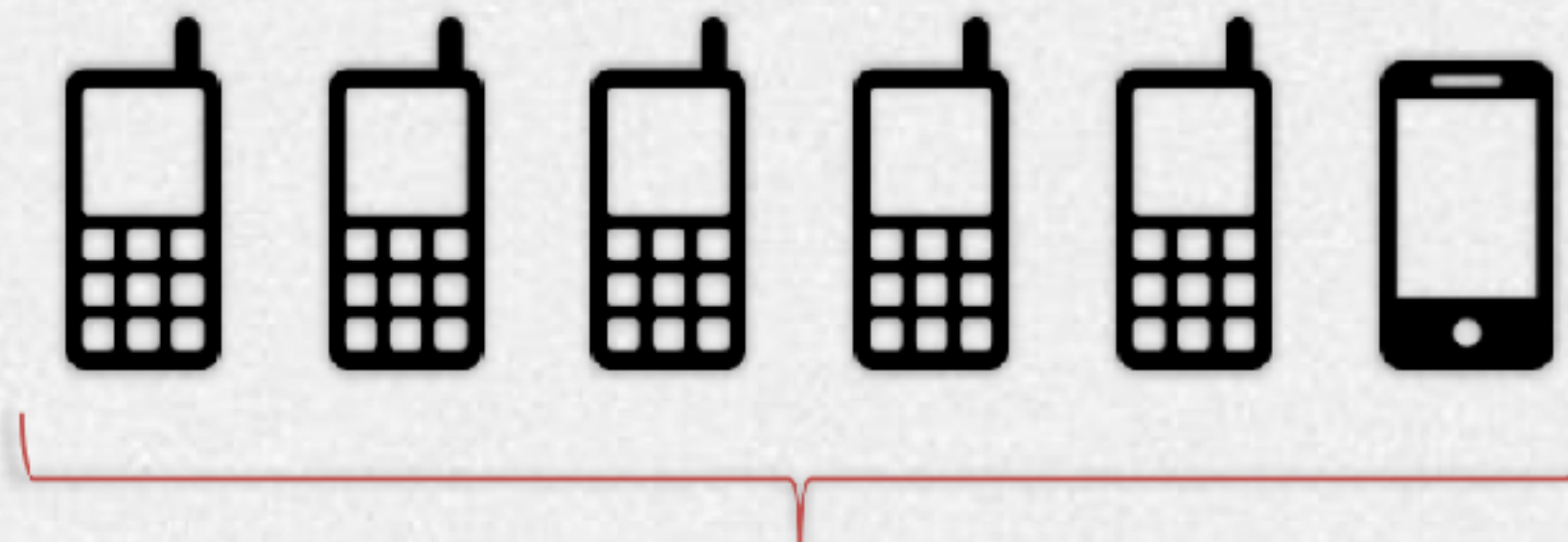
Andrea Ferracani

<http://www.micc.unifi.it/ferracani/>

Sviluppo di applicazioni mobile - devices



Sviluppo di applicazioni mobile - devices



1 out of 6
mobile phones is a Smartphone

Sviluppo di applicazioni mobile

- Esistono una molteplicità di smartphone/tablet che usano **piattaforme software diverse**
- Una piattaforma = un ambiente di sviluppo diverso, linguaggi di programmazione diversi
- Soluzione: un ambiente di sviluppo **cross-platform**



Soluzioni cross-platform esistenti



Phone**Gap**



 **monotouch**



ADOBE[®] AIR[™]



Sencha



TRIGGER.IO

FORGE



Corona



unity

jqTouch

Un esempio: Titanium

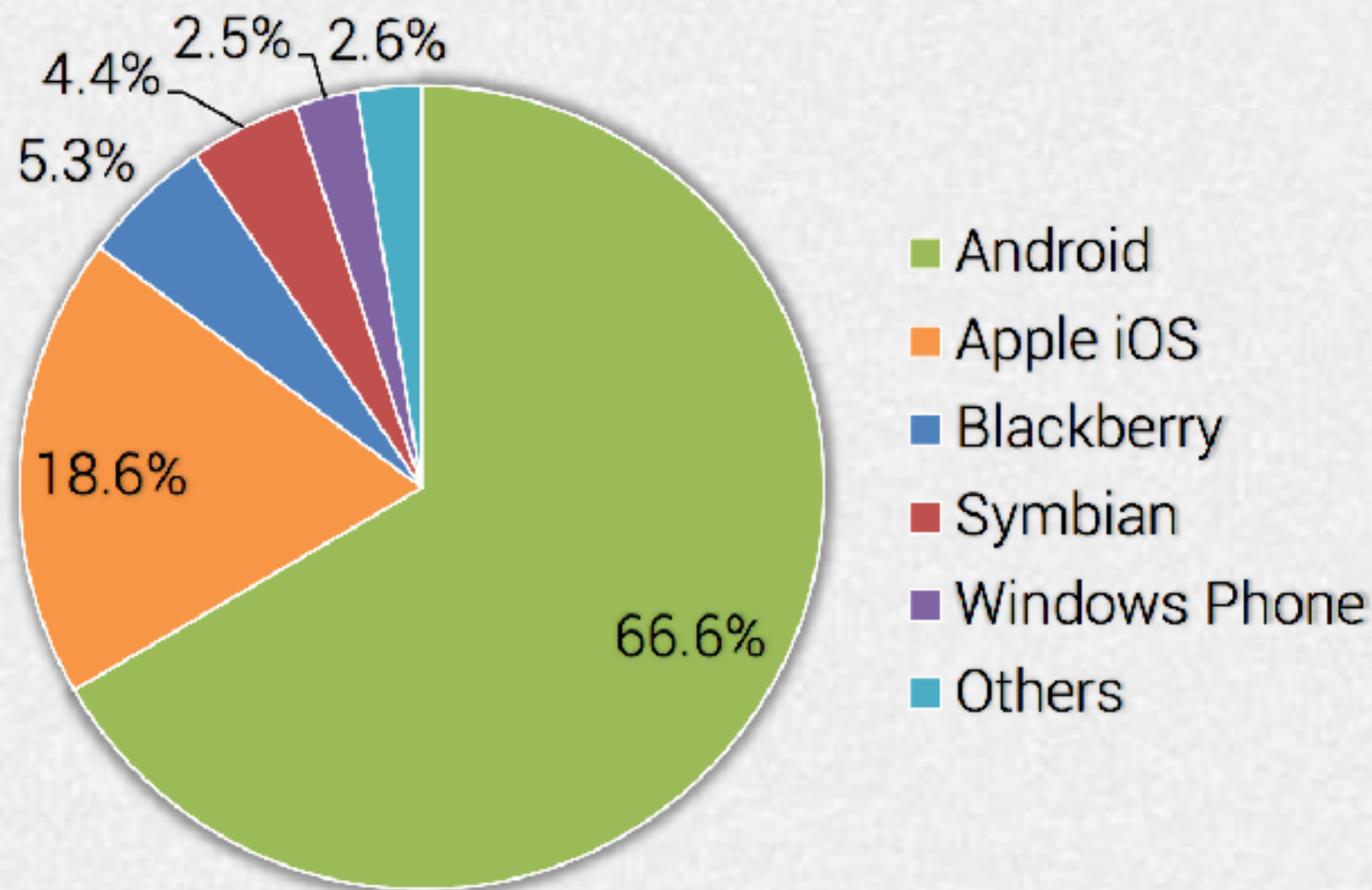
- È un ambiente di sviluppo cross-platform per creare **IOS**, **Android**, **BlackBerry** e **Hybrid/HTML5** apps (iPhone, iPad, iPod touch, Samsung Galaxy, Google Nexus, HTC Android, Kindle Fire, Nook Tablet, etc.)
- Le applicazioni Titanium sono scritte in **javascript**
- Il javascript si interfaccia con i controlli nativi attraverso un **abstraction layer**
- Titanium espone una IDE basata su **Eclipse** che si chiama **Titanium Studio**
- Titanium ha un framework **MVC** chiamato **Alloy**
- Appcelerator offre **Cloud Services**
- Titanium è nato **free** ed **opensource** (dal 2015 a pagamento)

Sviluppo IOS ed Android

- Con **Android** si scrivono applicazioni native in **Java**
- Con **IOS** si scrivono applicazioni nativi in **Objective-C**
- Con Titanium (oppure altre piattaforme quali PhoneGap) si scrivono applicazioni **cross-platform** in javascript che girano su IOS, Android ed altre piattaforme



Sviluppo di applicazioni mobile global smartphone market share



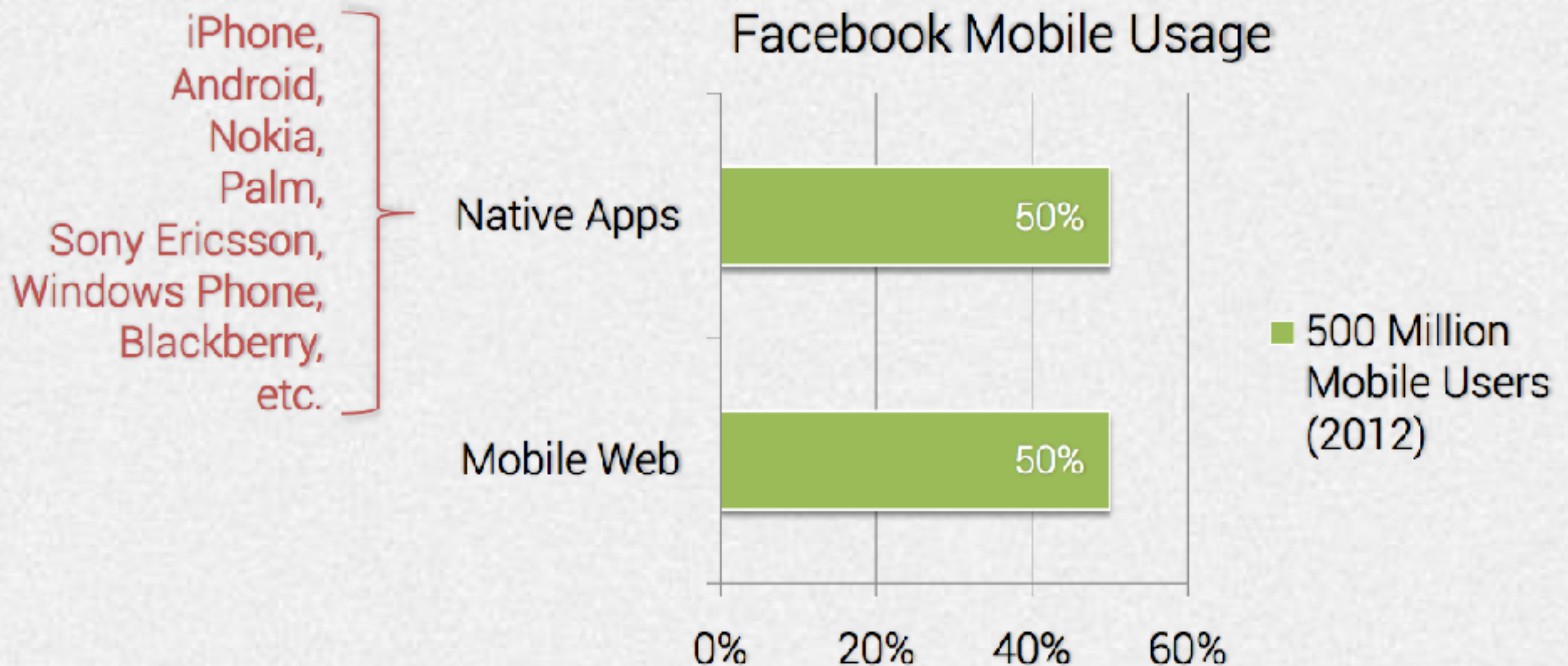
Sviluppo di applicazioni mobile



Native

Mobile Web

Sviluppo di applicazioni mobile



Architettura client - info

Facebook native | iOS 6

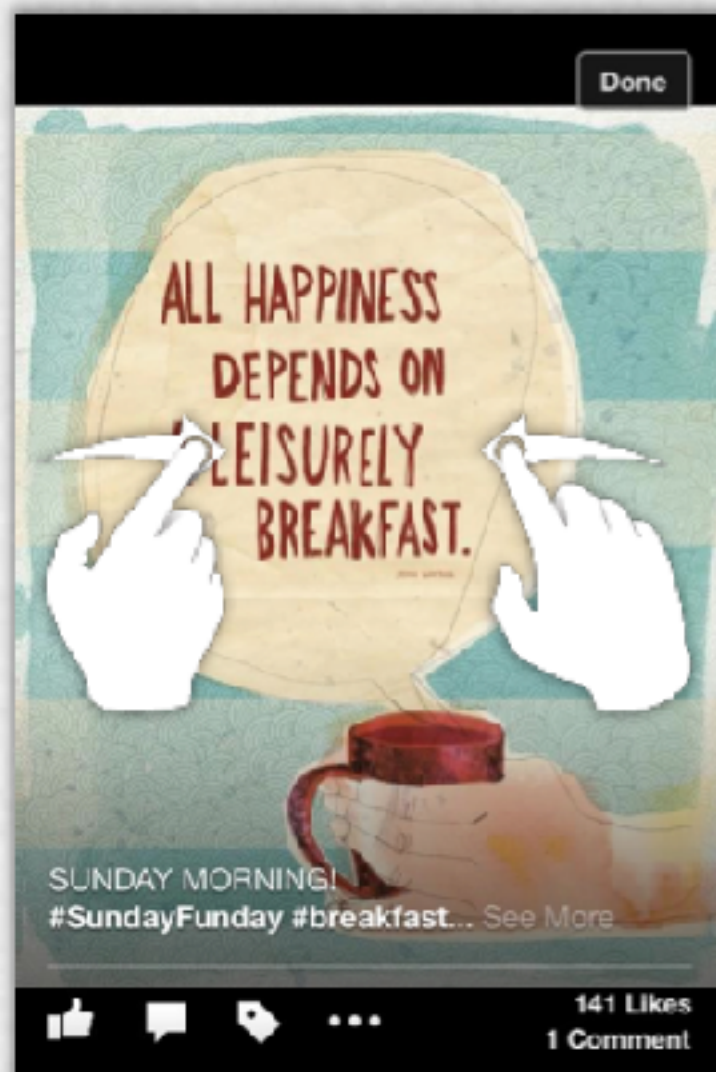


Facebook web | Safari on iOS 6

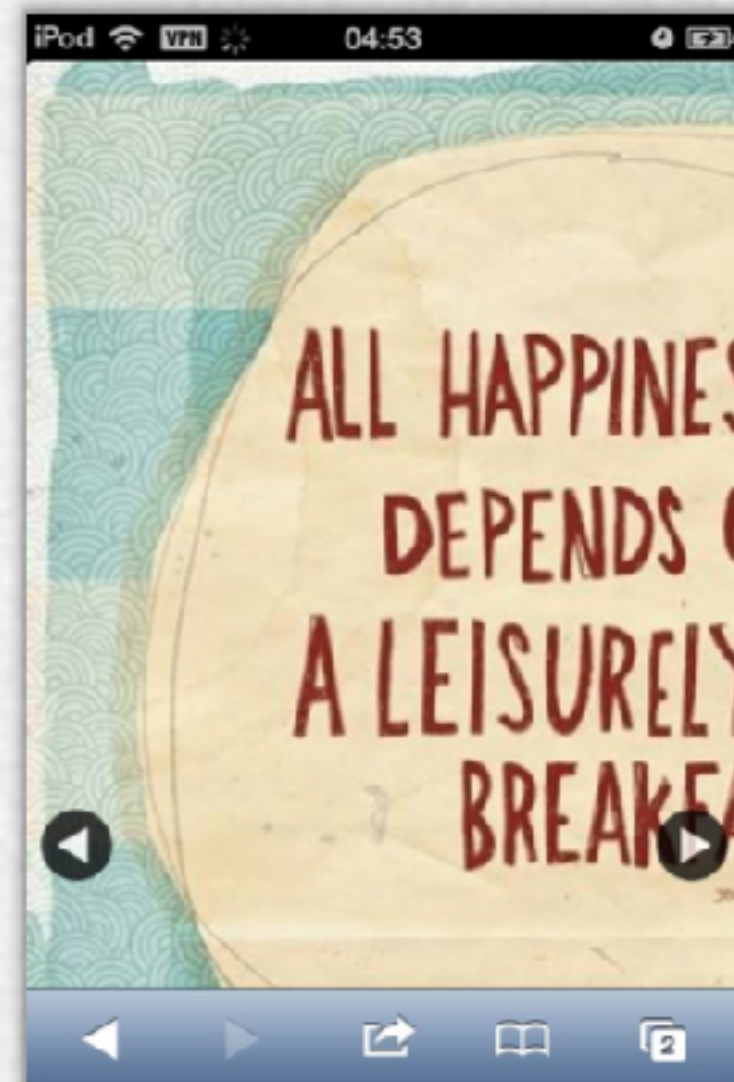


Architettura client

Facebook native | iOS 6



Facebook web | Safari on iOS 6



Gestures

Tap



Double Tap



Touch & Hold



Swipe



Rotate



Pinch close



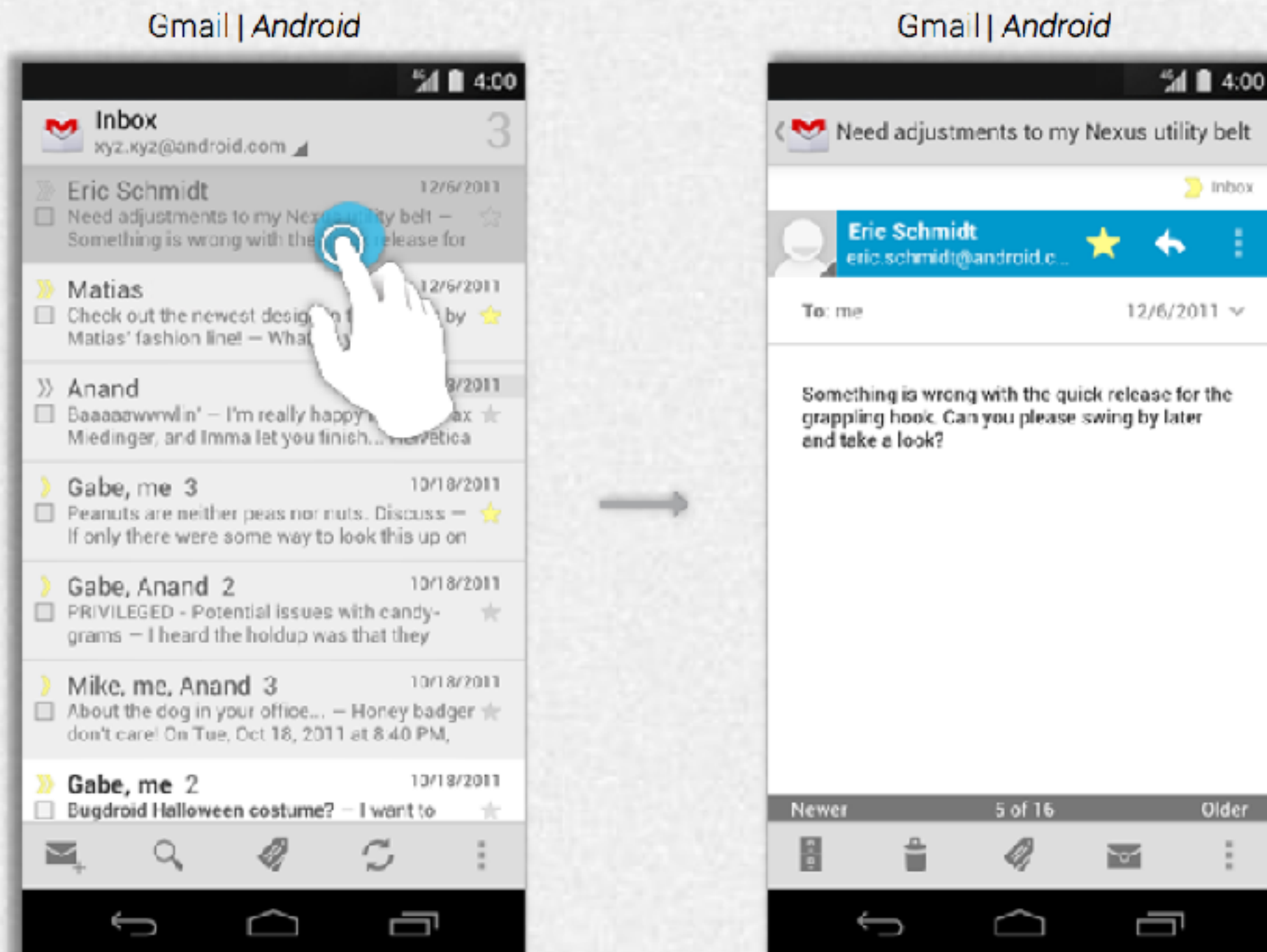
Pinch open



Shake

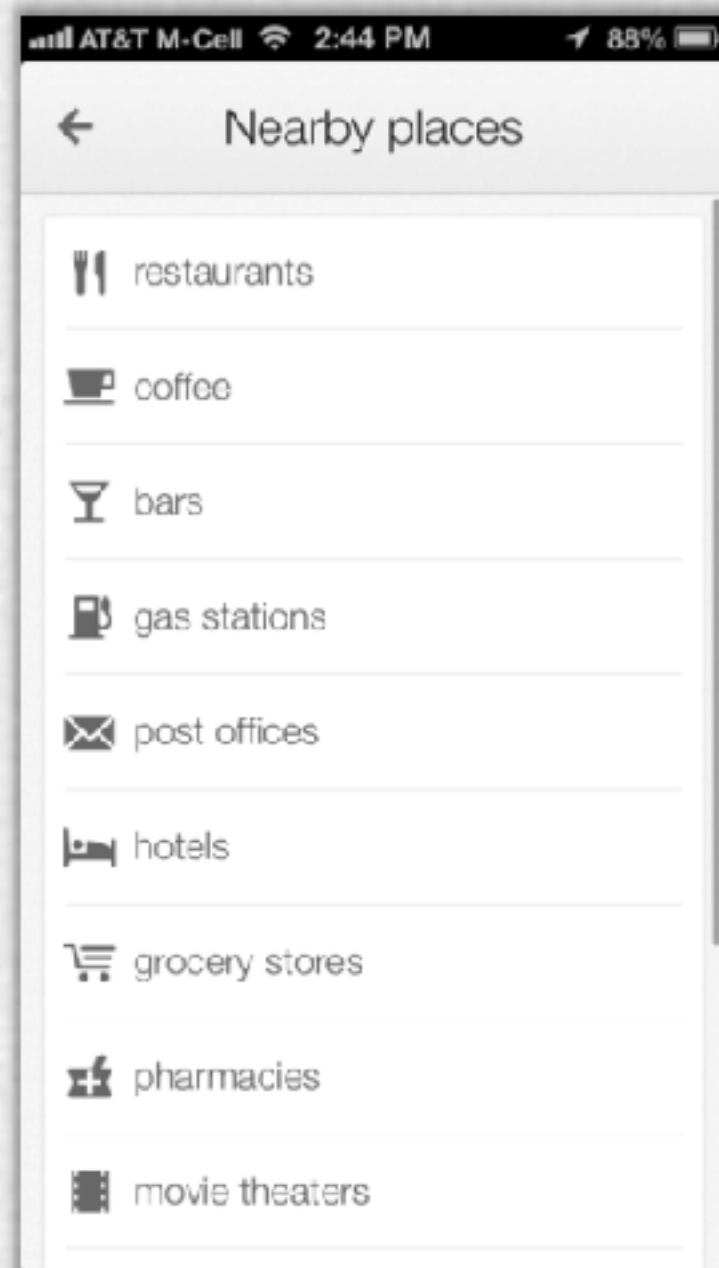


Architettura client - design patterns

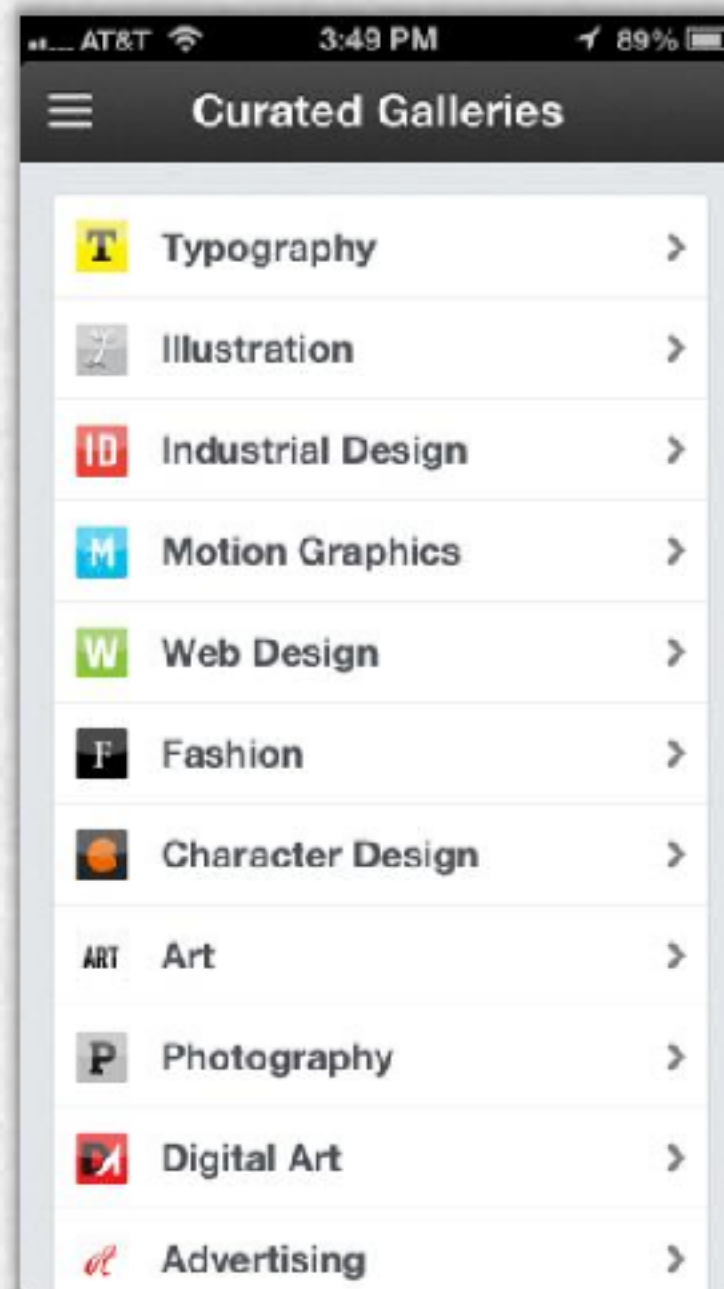


Architettura client - design patterns - liste

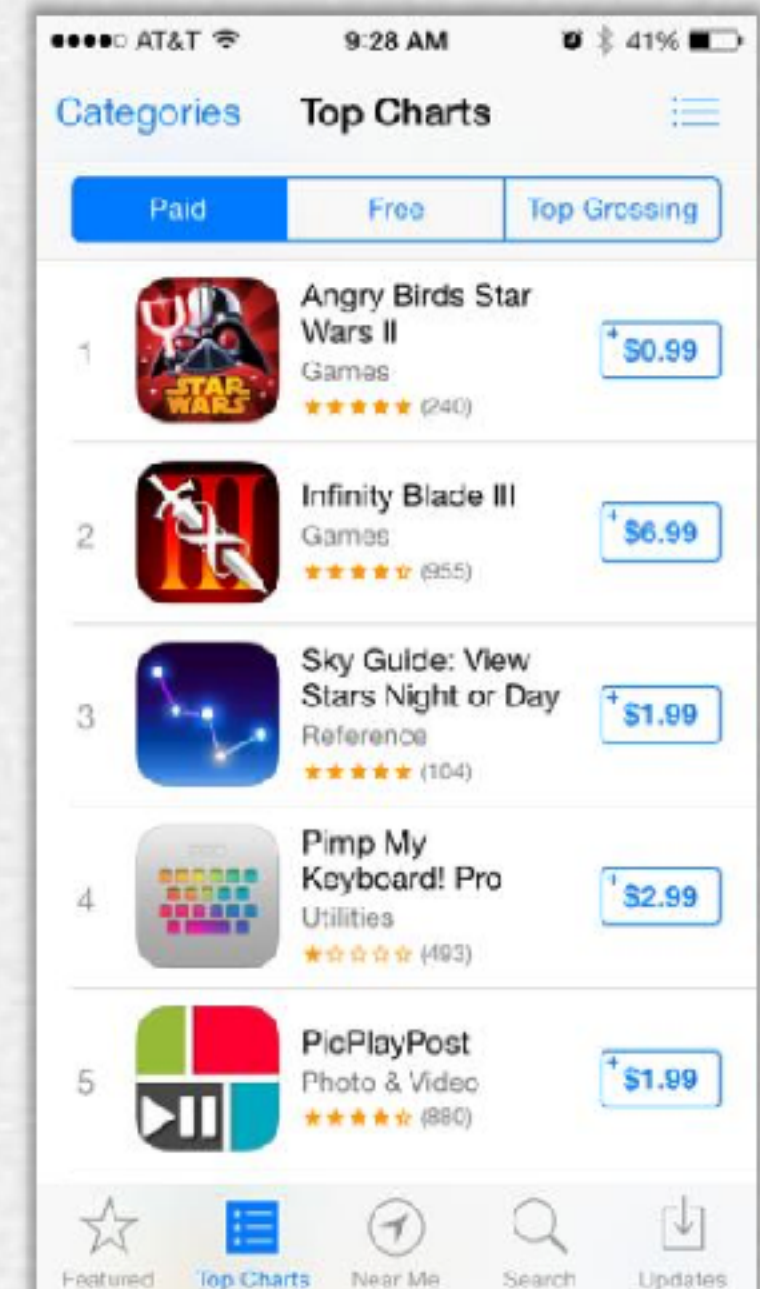
Google Maps | iOS



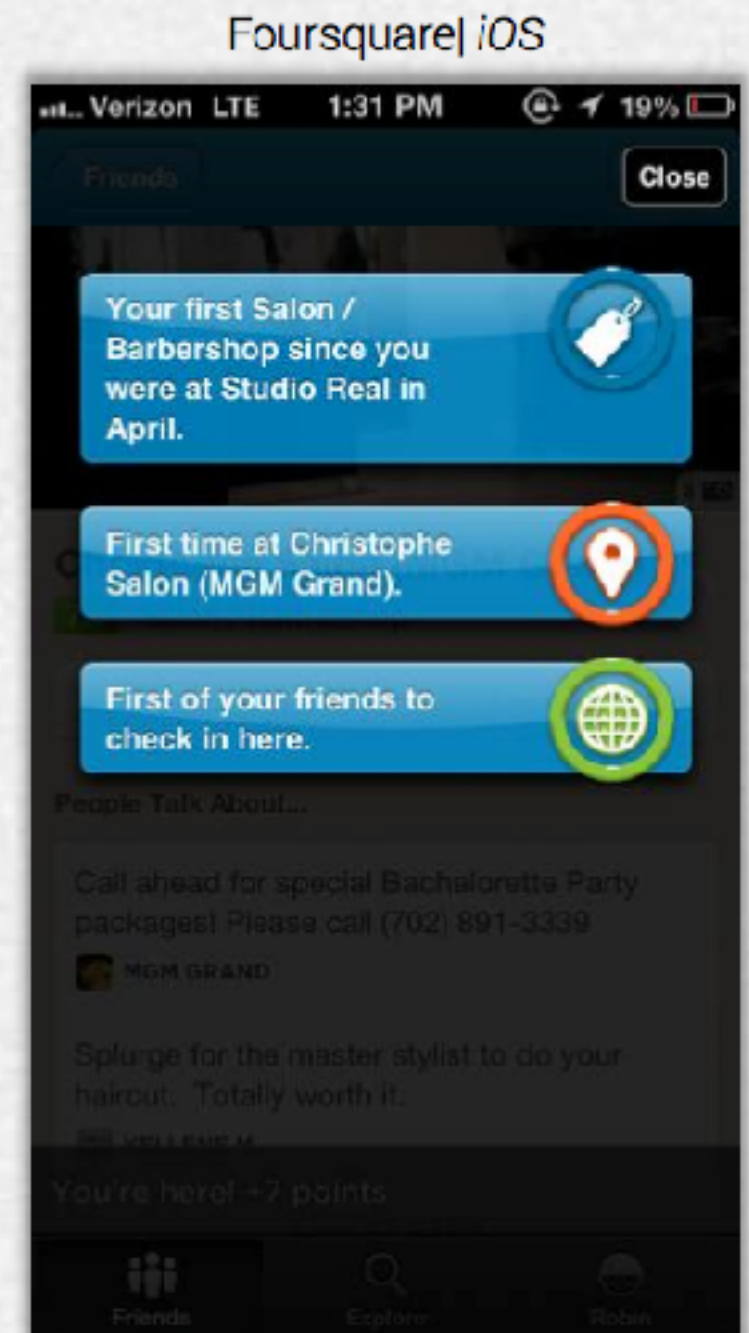
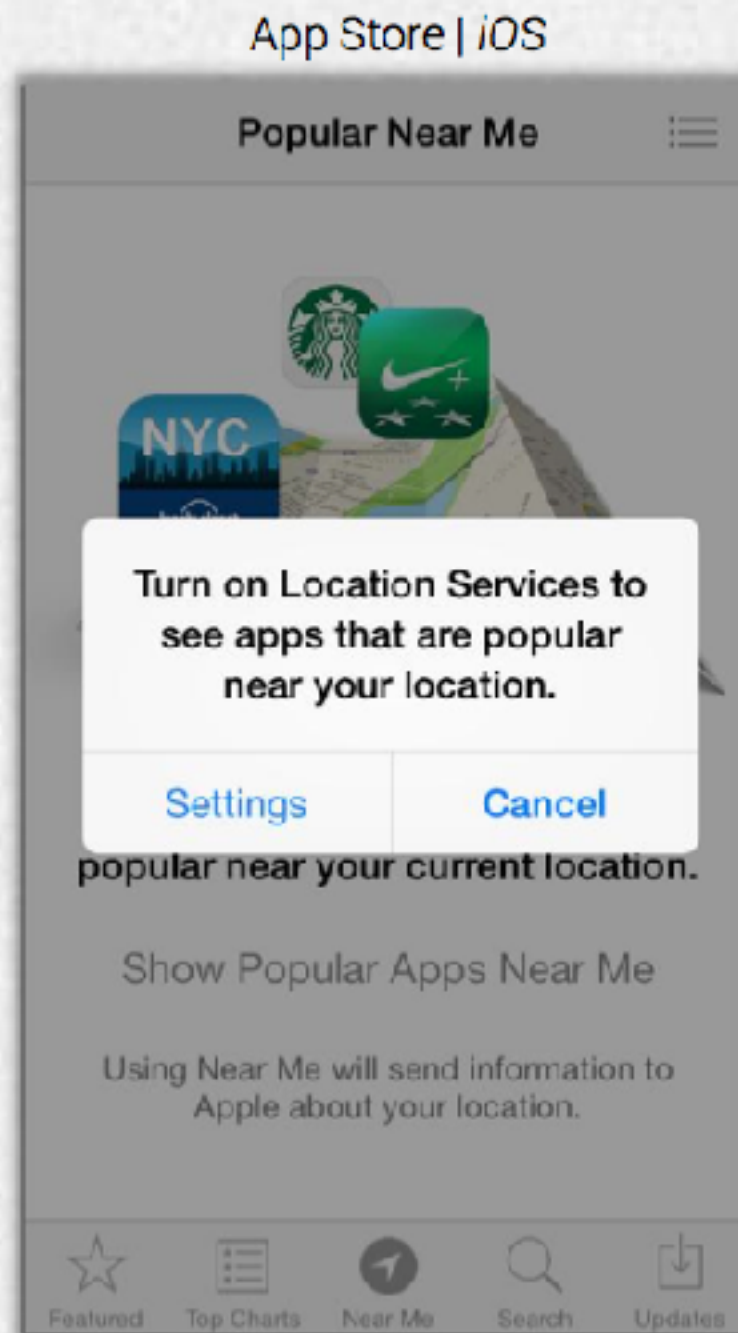
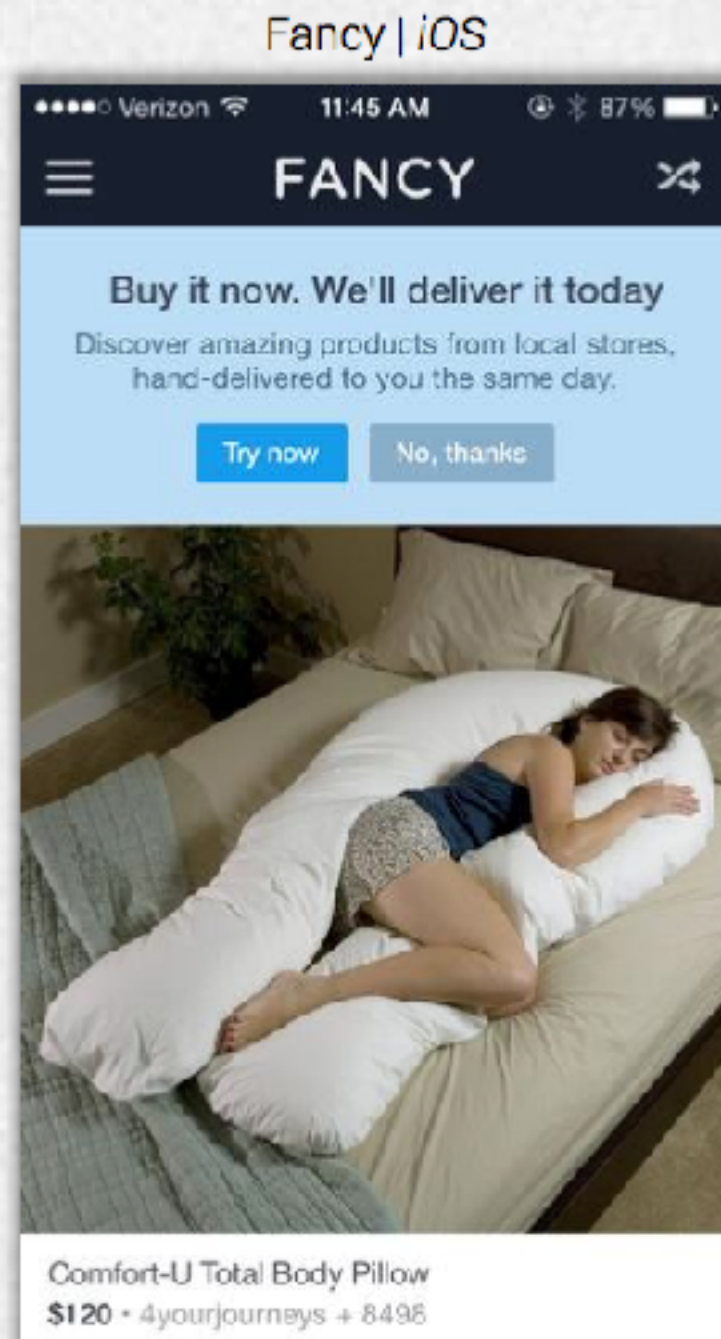
Behance | iOS



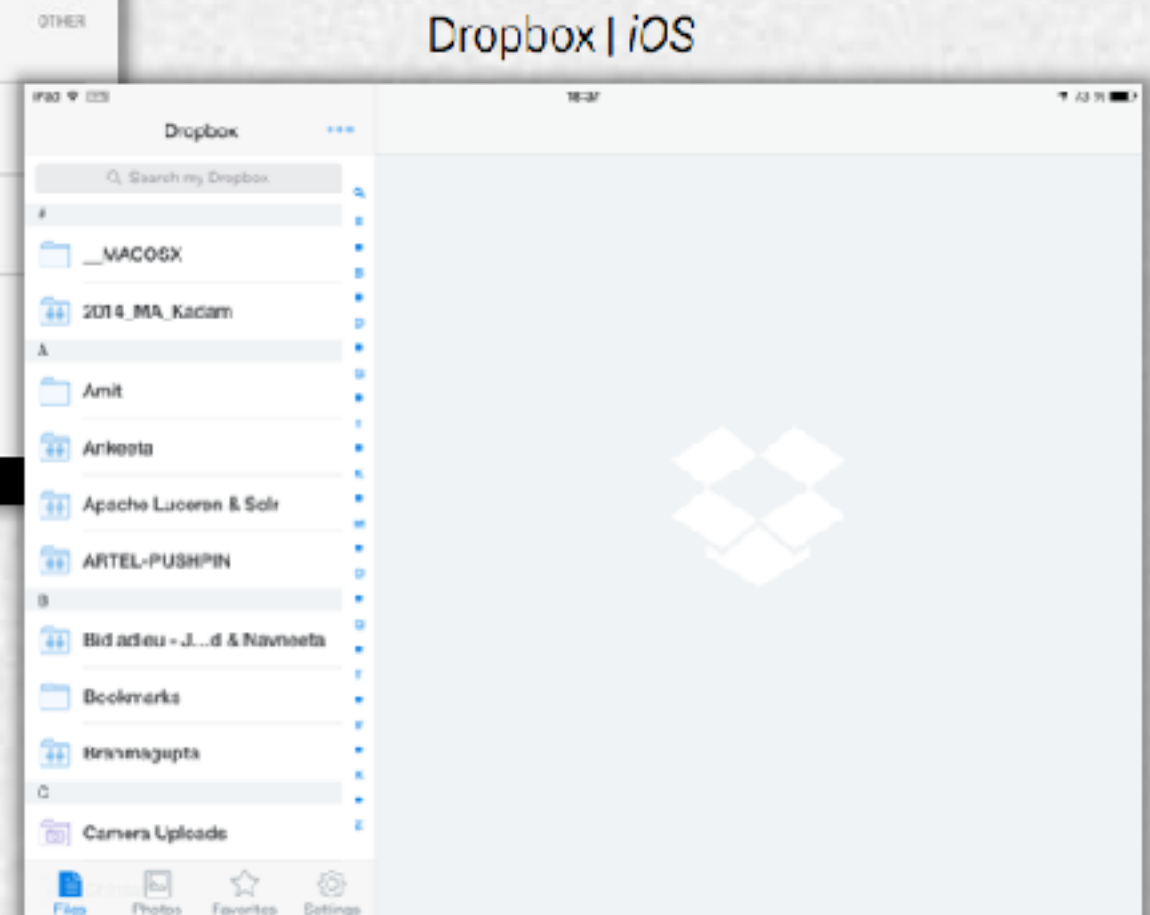
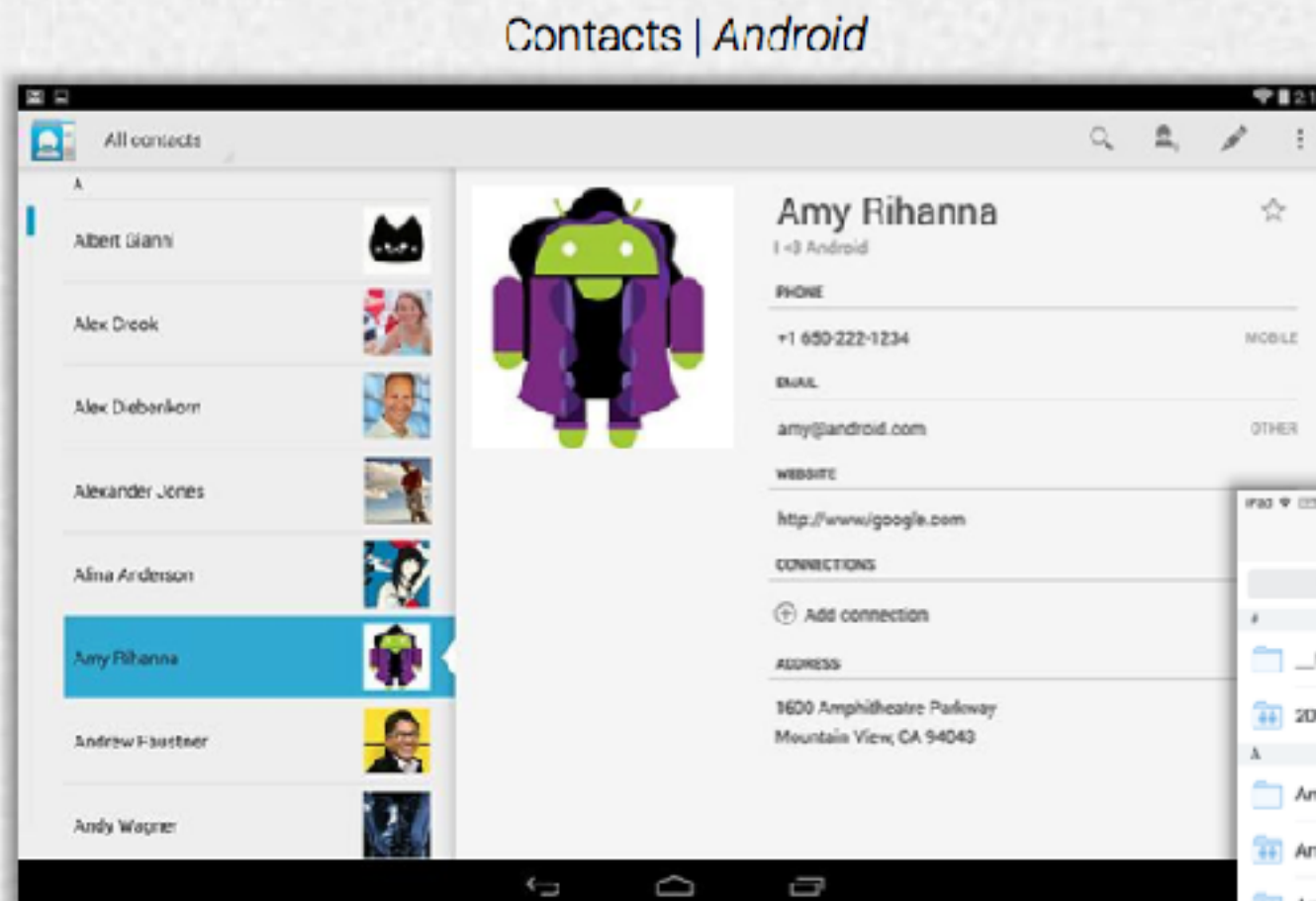
App Store | iOS



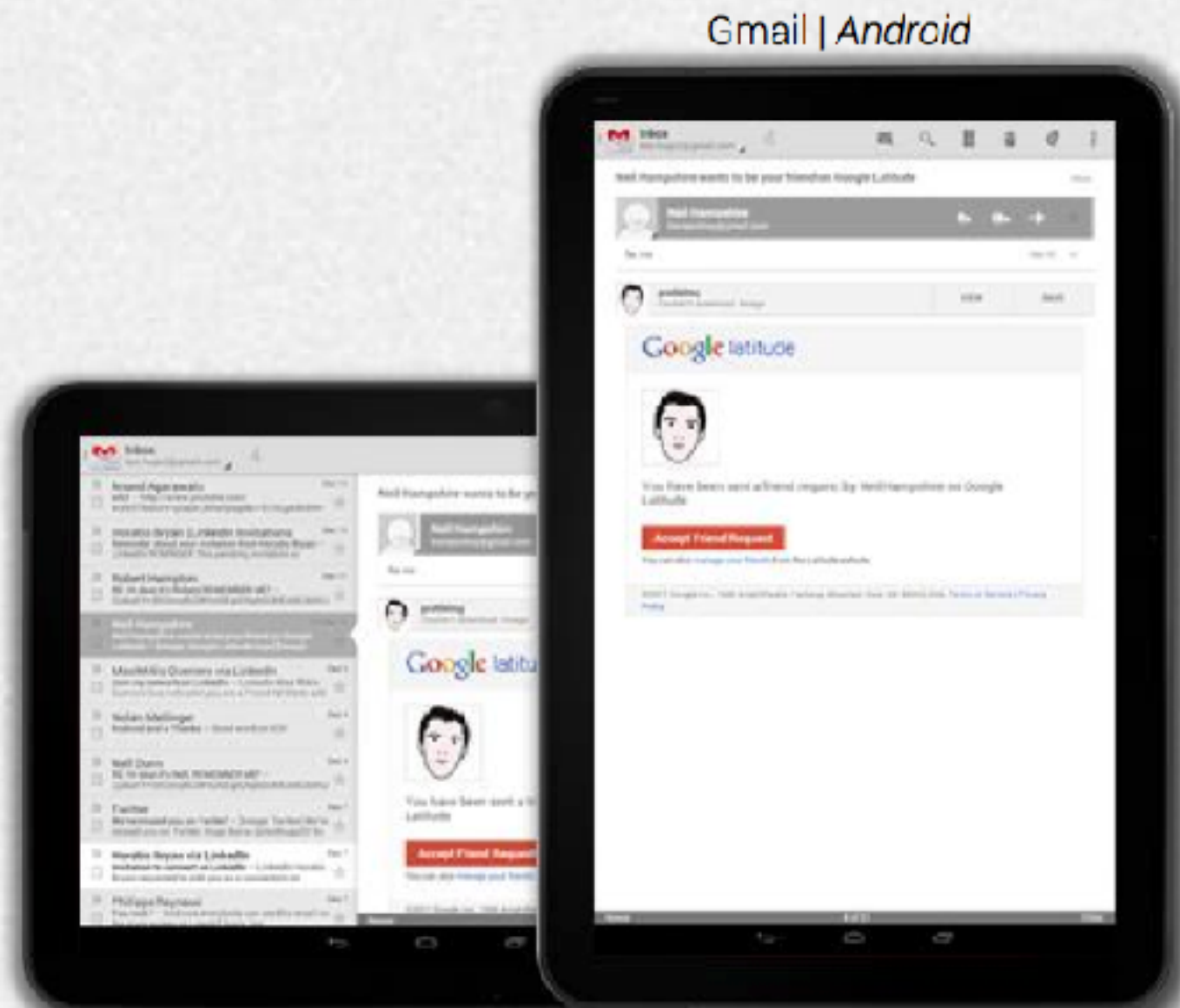
Architettura client - design patterns - alerts/ dialog



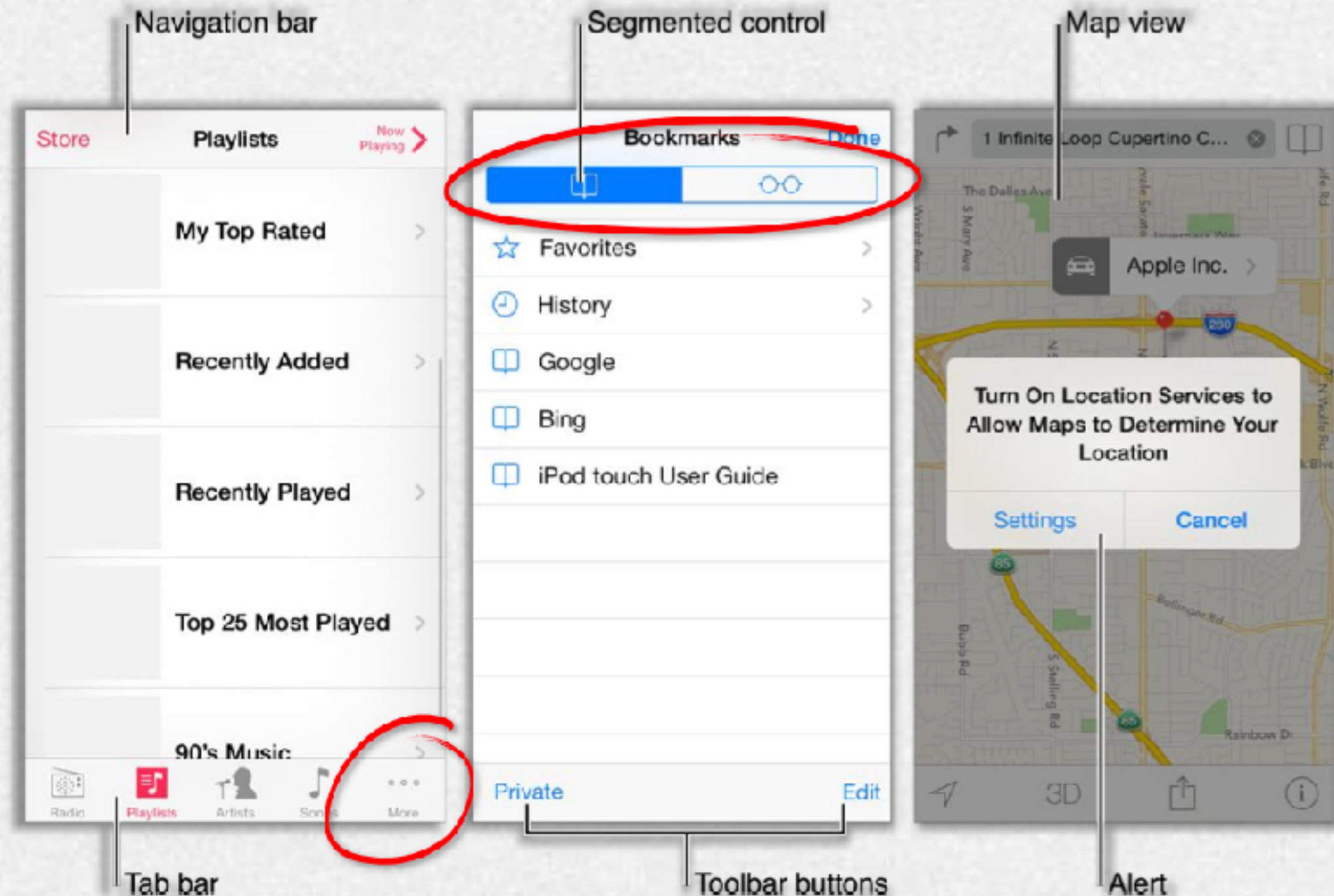
Architettura client - design patterns - multi-pane



Architettura client - design patterns - multi-pane



Architettura client - design patterns - IOS UI



Architettura client - design patterns - Android UI

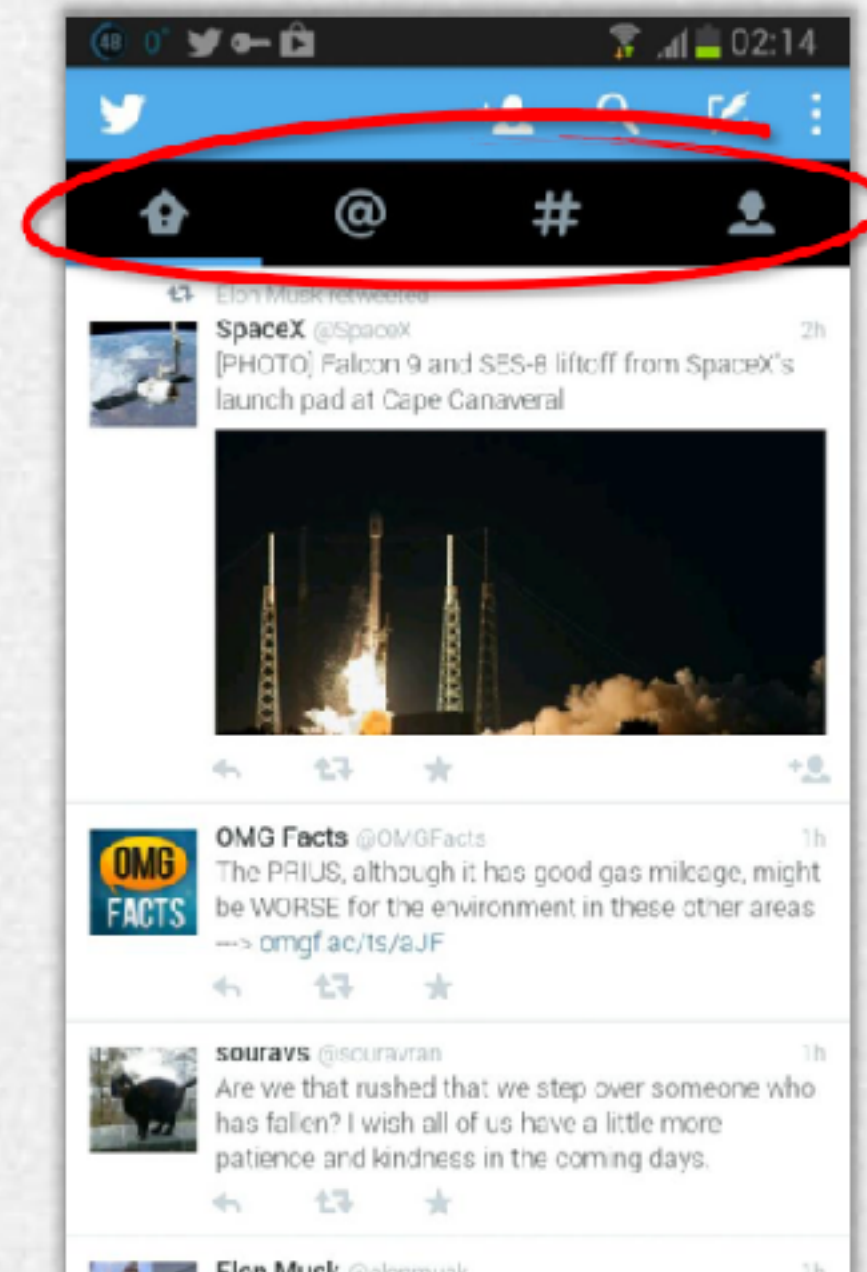


Architettura client - design patterns - case study: Twitter

iOS

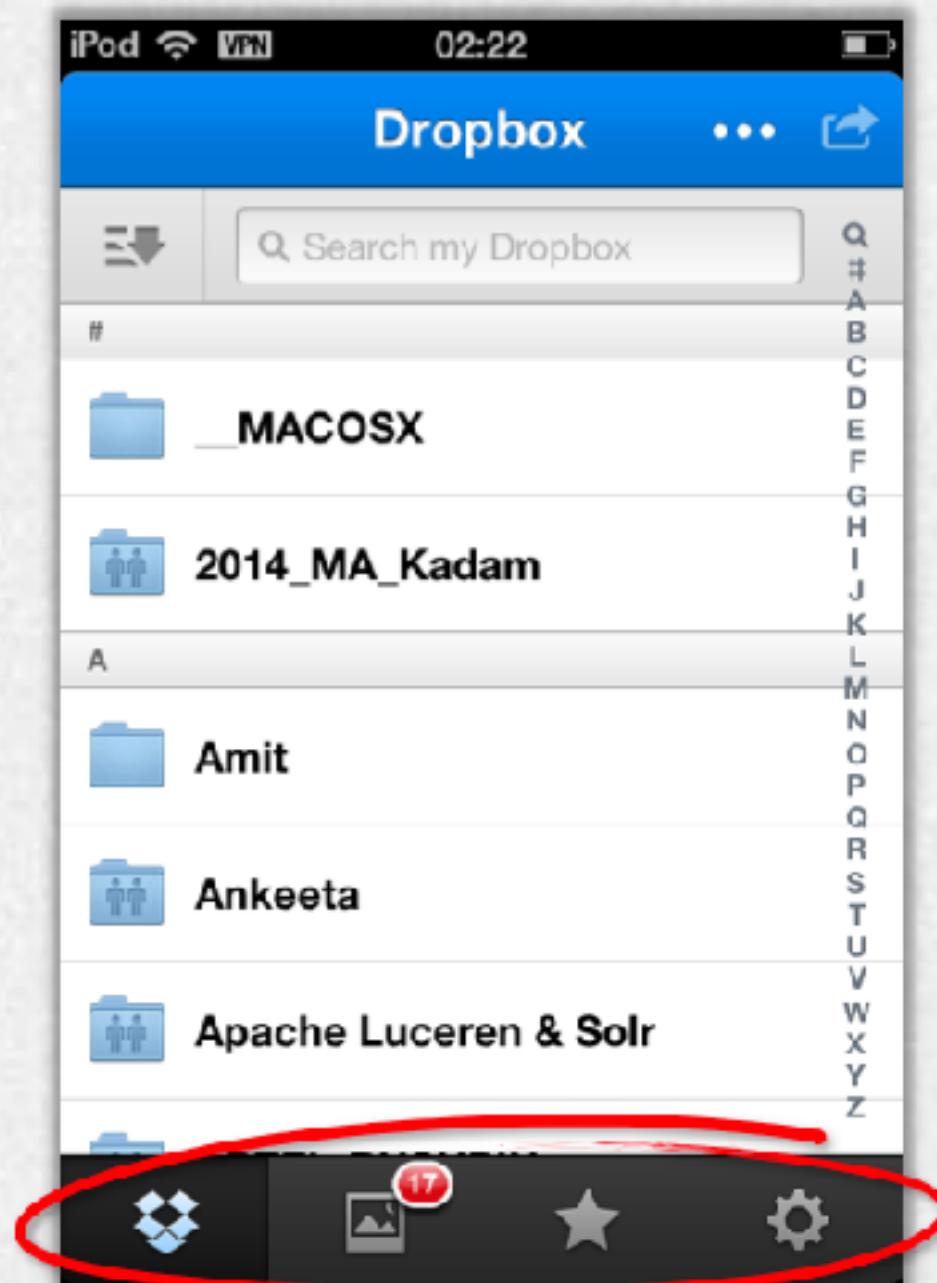


Android

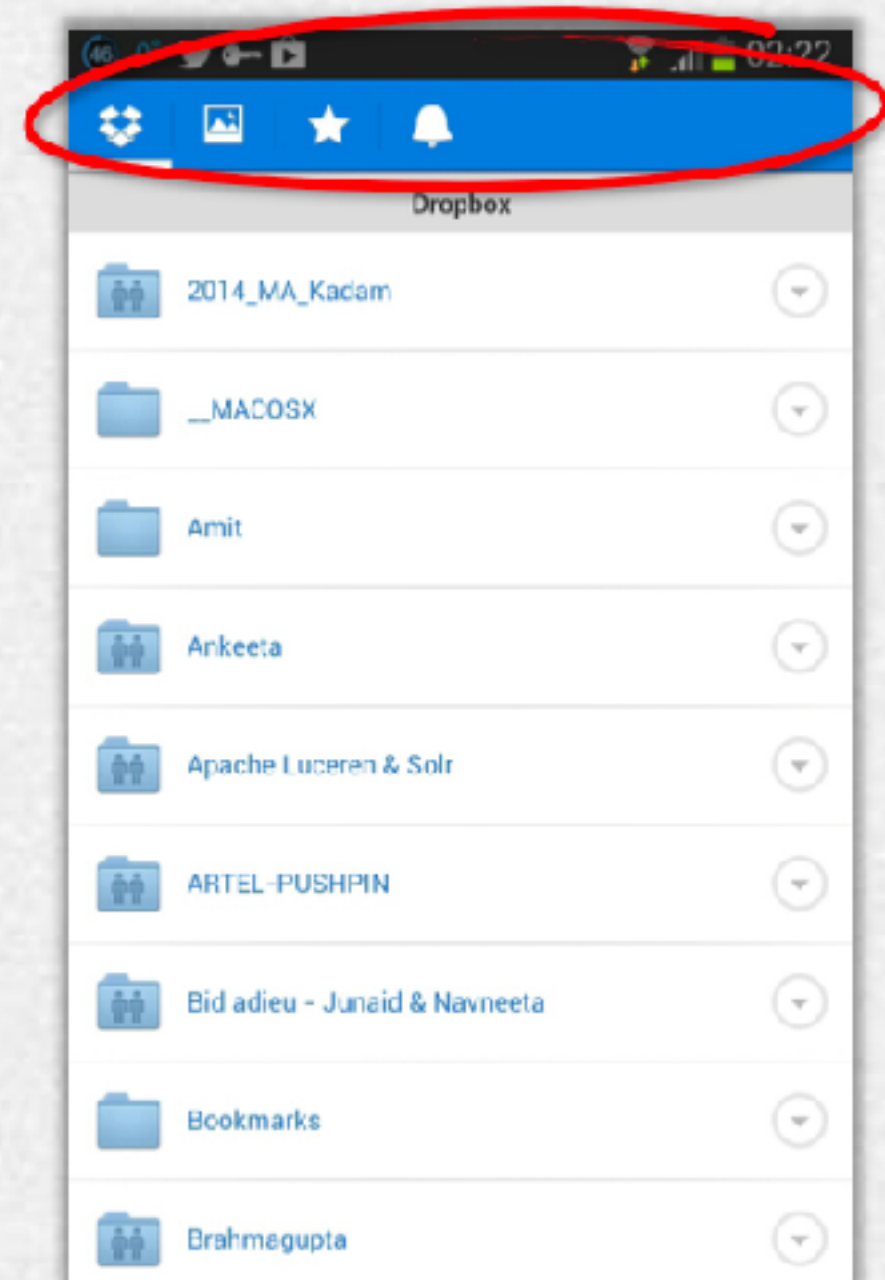


Architettura client - design patterns - case study: Dropbox

iOS

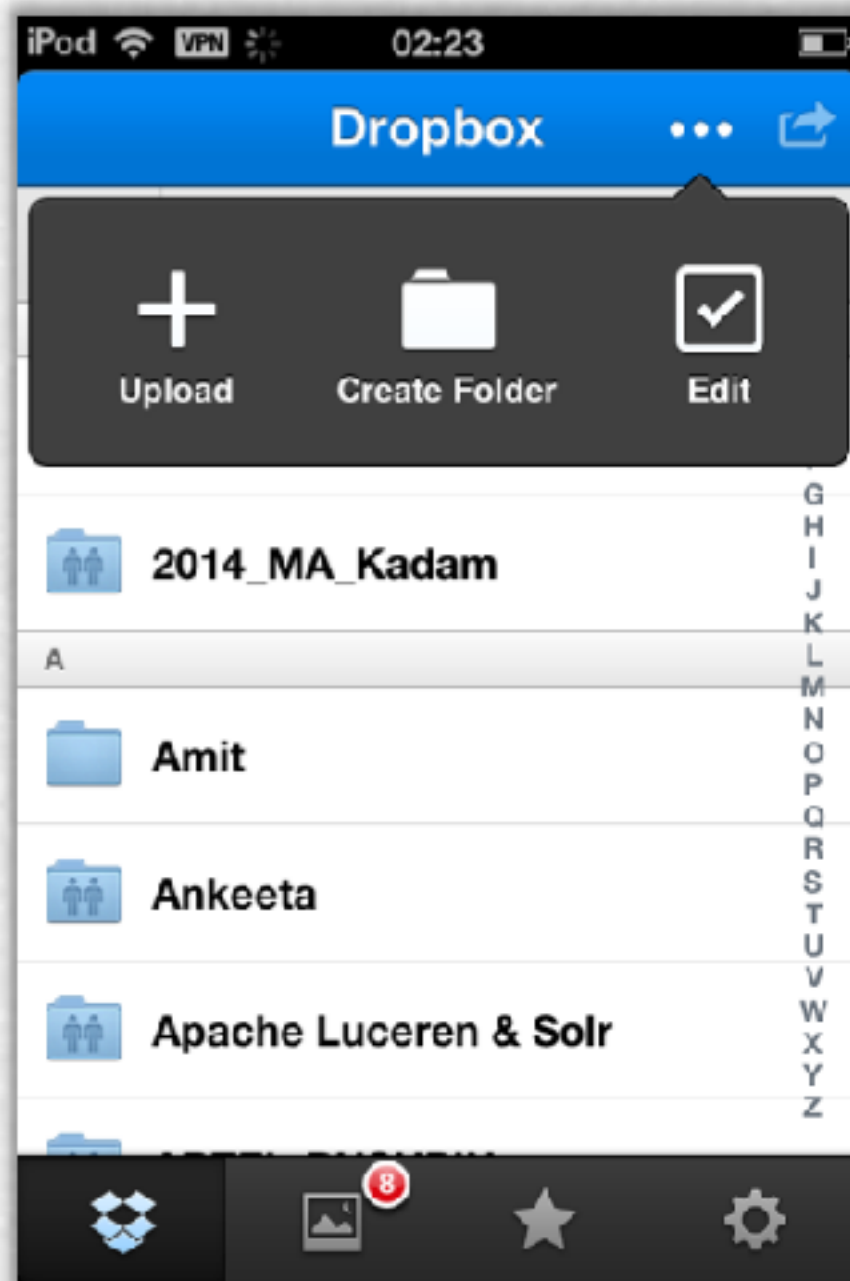


Android

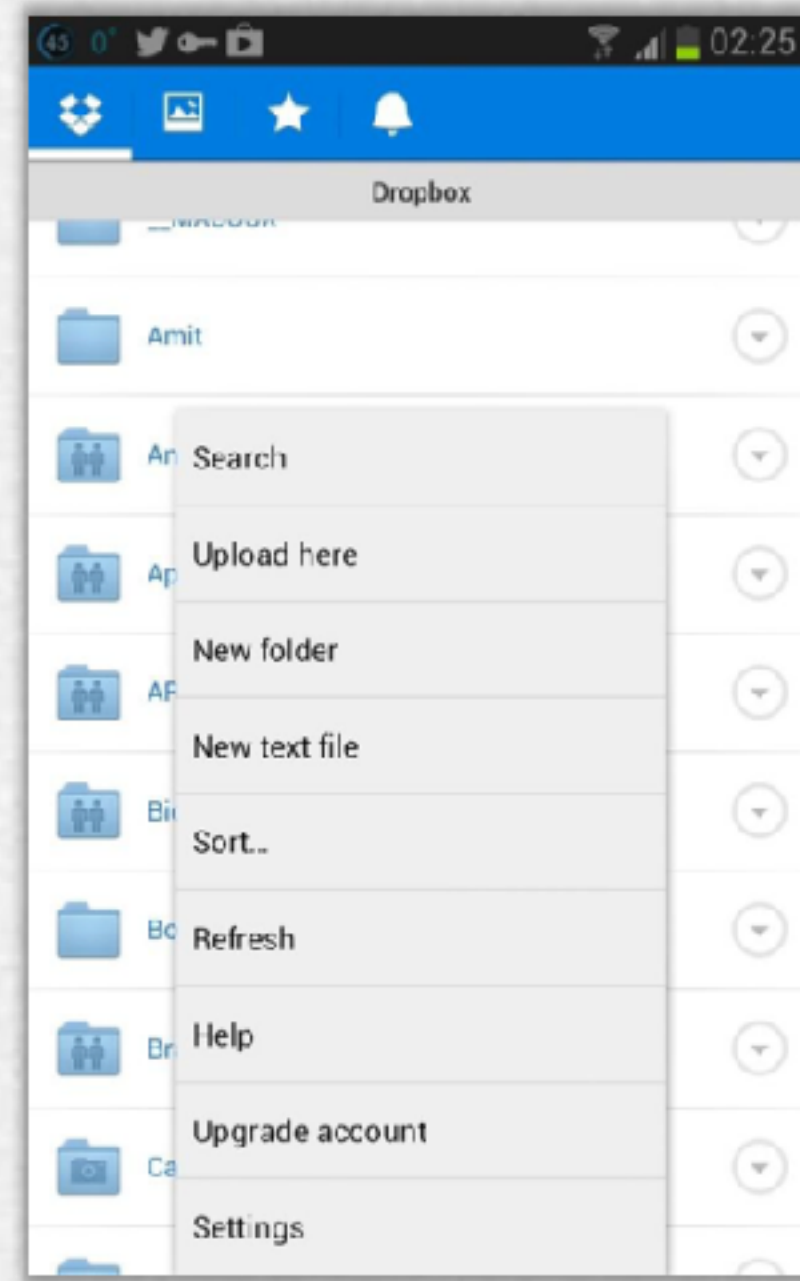


Architettura client - design patterns - case study: Dropbox

iOS

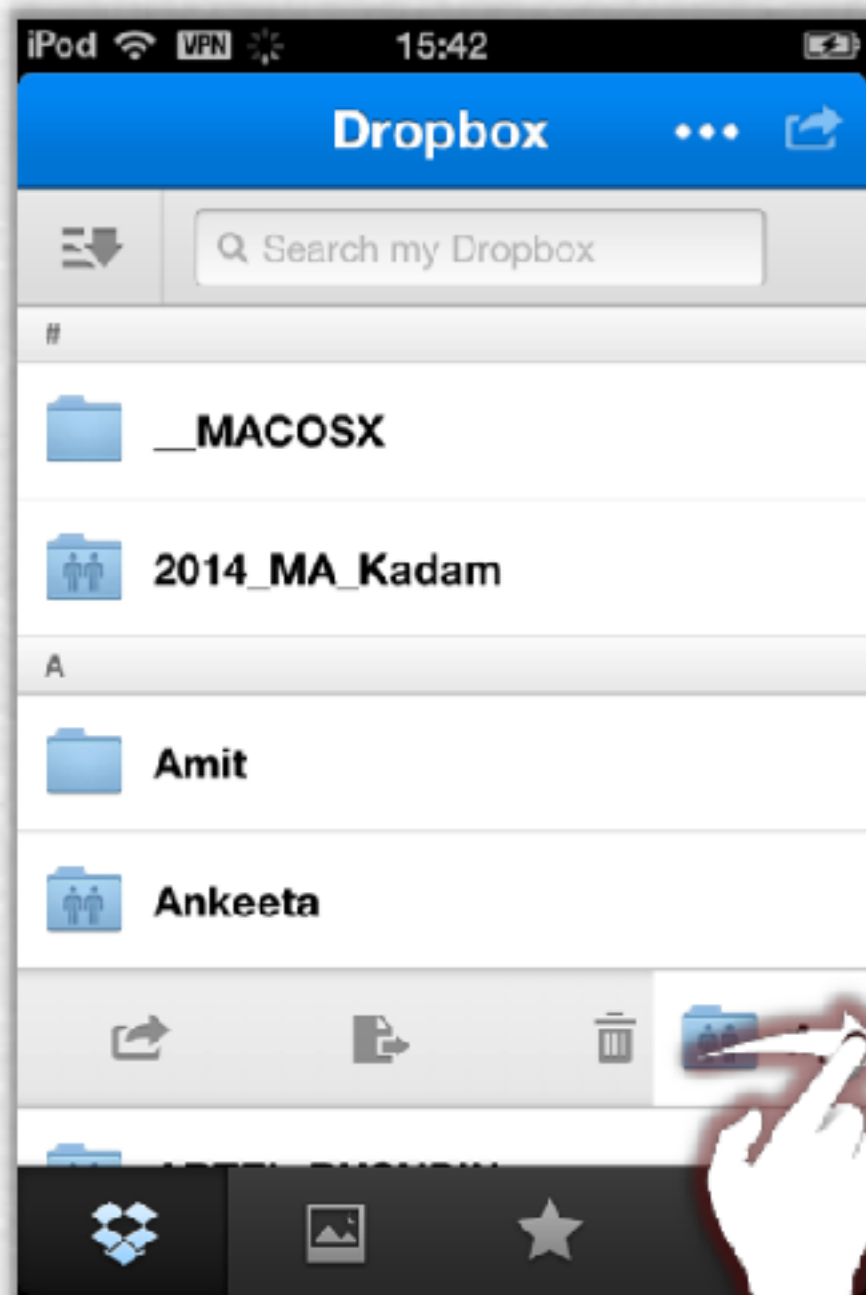


Android

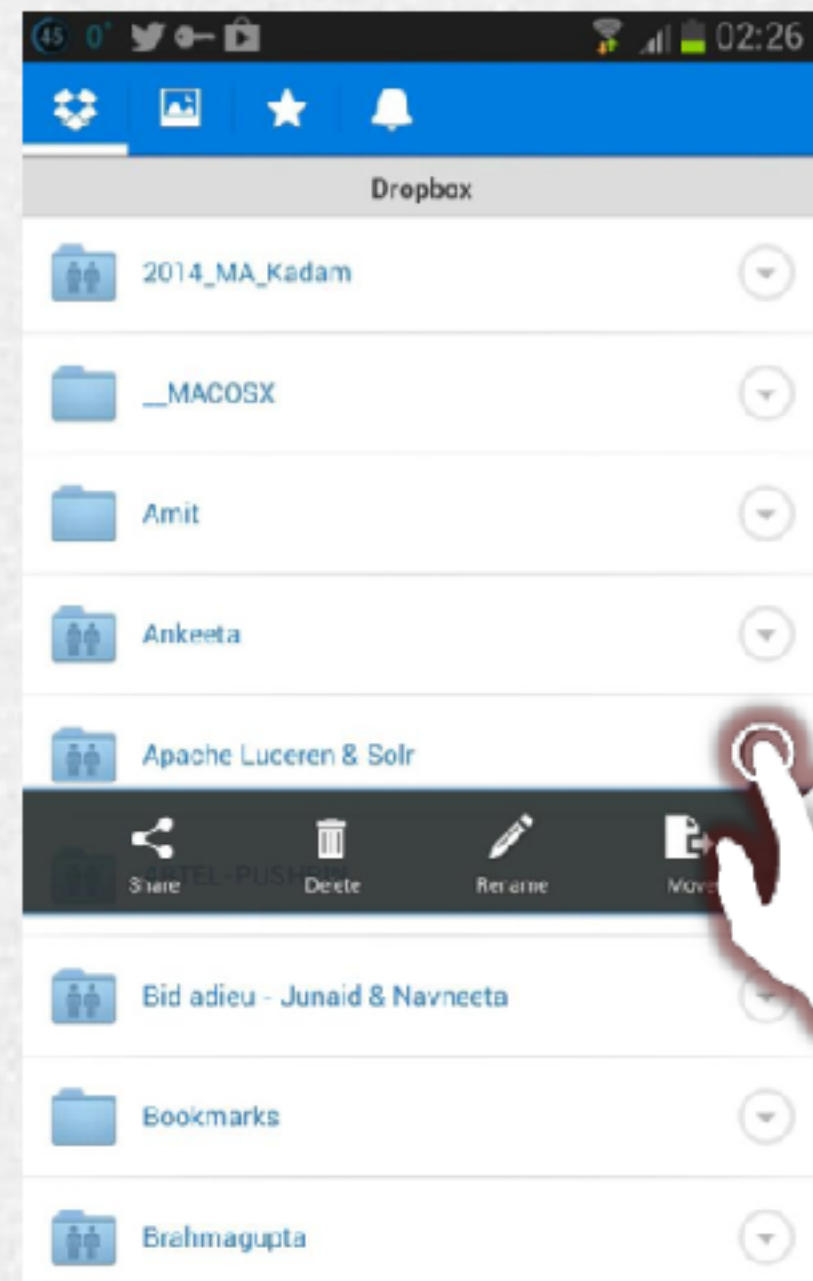


Architettura client - design patterns - case study: Dropbox

iOS

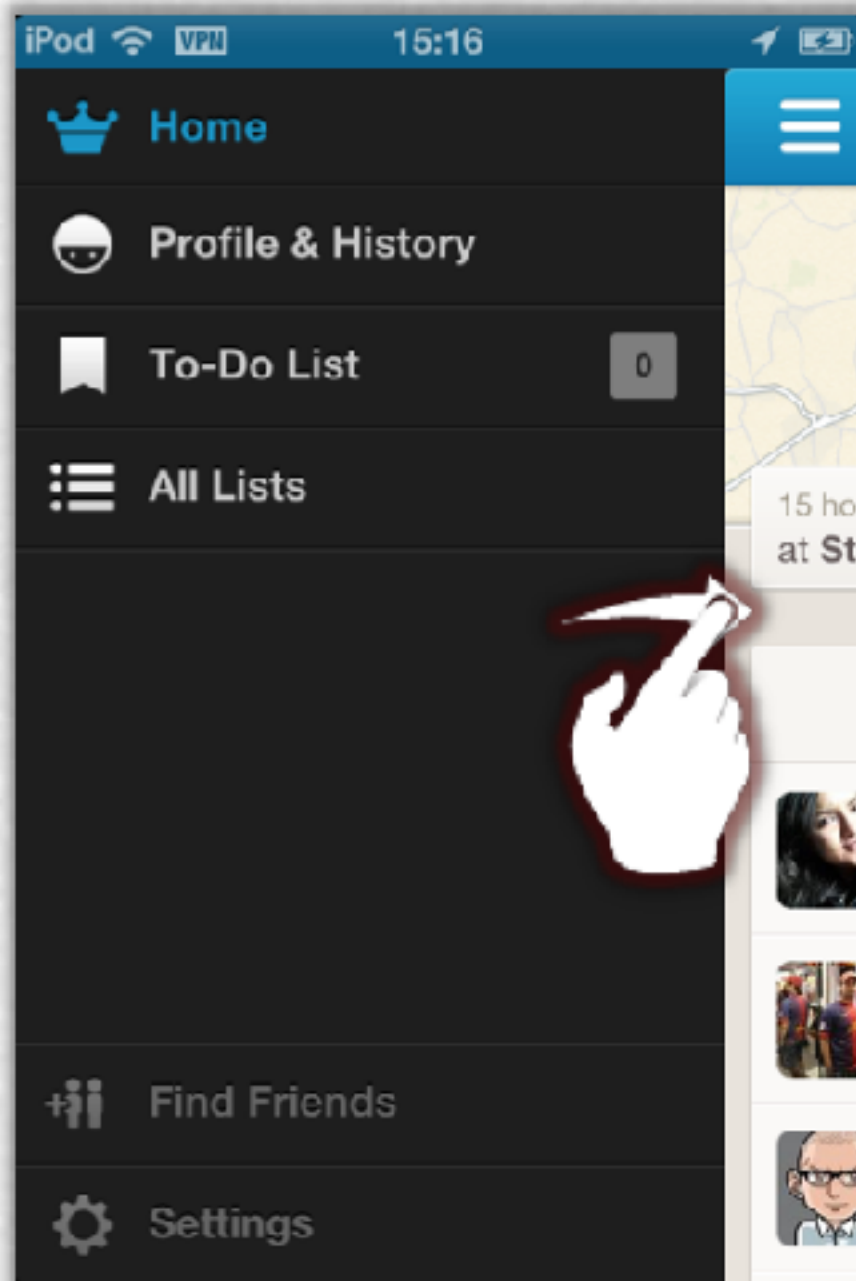


Android

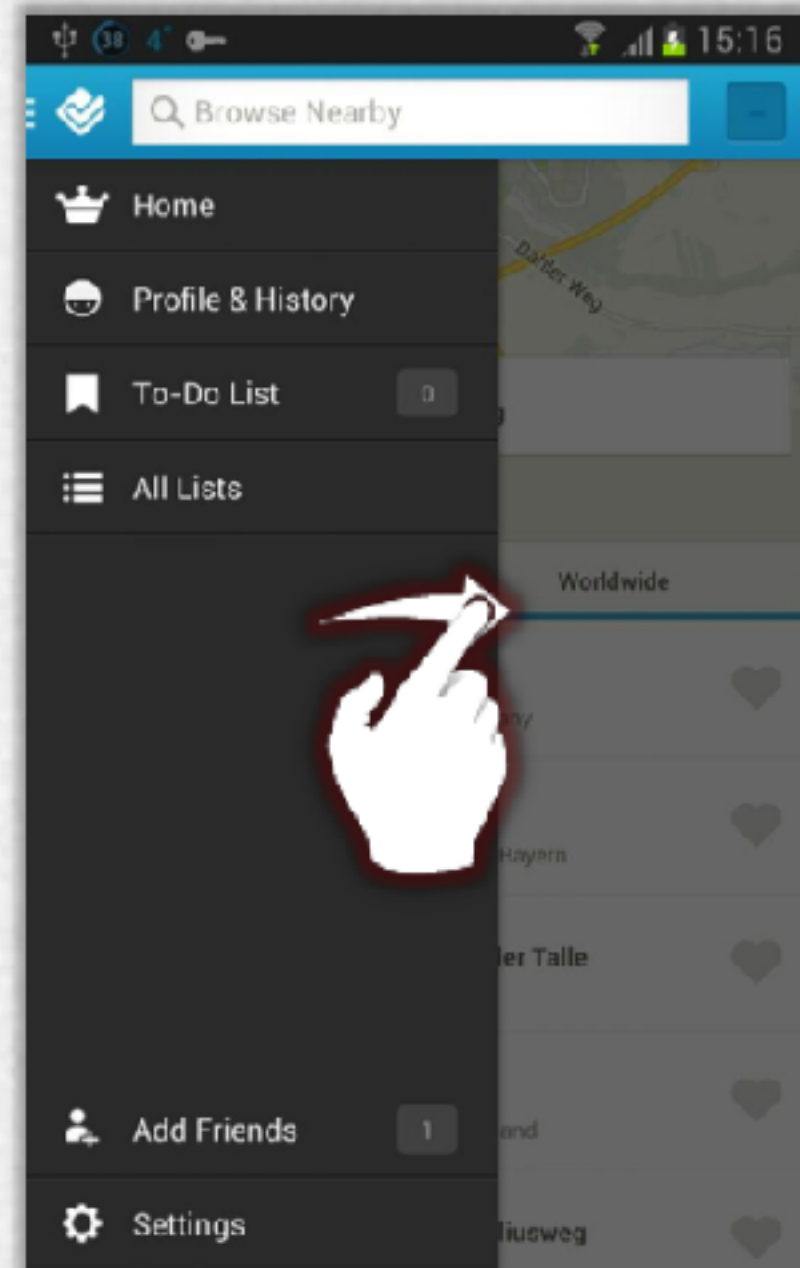


Architettura client - design patterns - case study: Foursquare

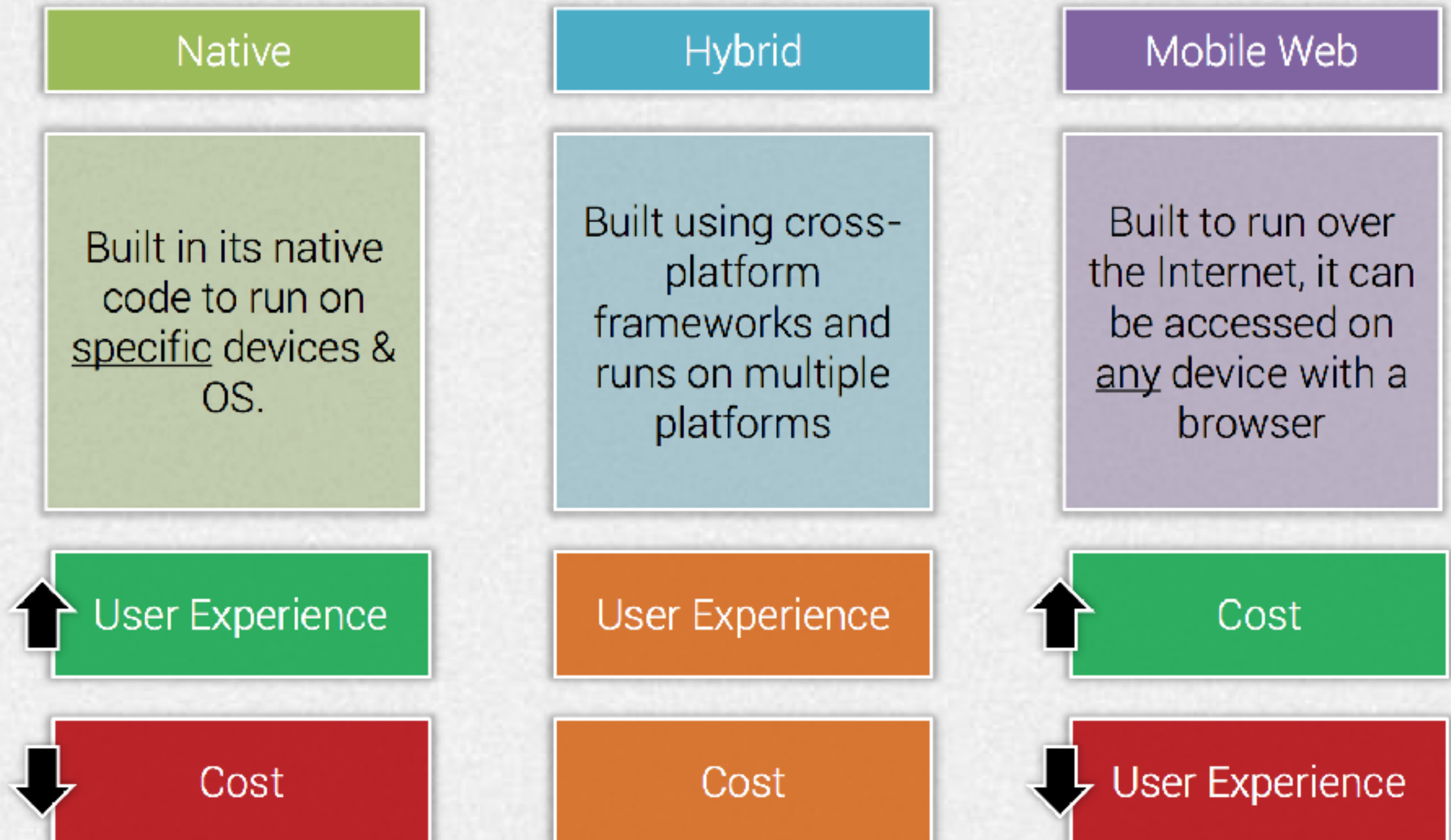
iOS



Android



Sviluppo di applicazioni mobile



Risoluzioni dispositivi mobili (iphone)

<http://www.iphoneresolution.com/>

Different visitors to your site will have different sized screens that show different amounts of information, so your design needs to be able to work on a range of different sized screens.



iPhone 4

Size: 3.5 inches

Resolution: 960 x 640 pixels



iPad 2

Size: 9.7 inches

Resolution: 1024 x 768 pixels

Risoluzioni desktop (Apple)

Resolution refers to the number of dots a screen shows per inch. Some devices have a higher resolution than desktop computers and most operating systems allow users to adjust the resolution of their screens.



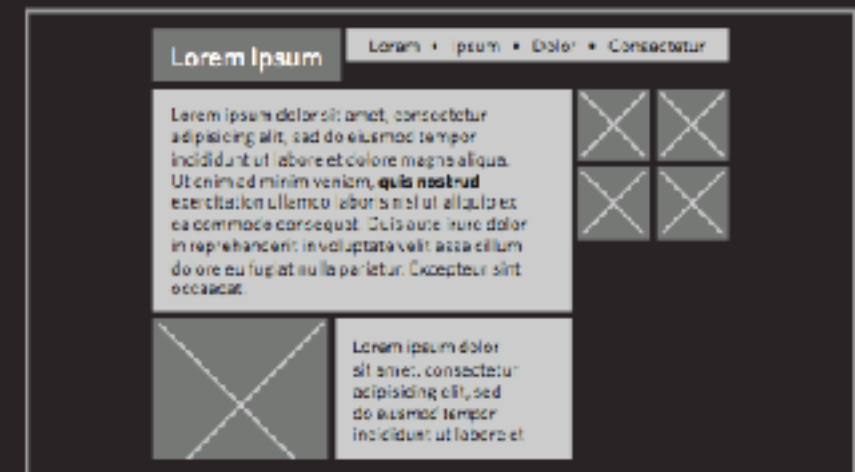
13" MacBook
Size: 13.3 inches
Resolution: 1280 x 800 pixels



27" iMac
Size: 27 inches
Resolution: 2560 x 1440 pixels

Tipi di layout web: fisso

Fixed width layout designs do not change size as the user increases or decreases the size of their browser window. Measurements tend to be given in pixels.



ADVANTAGES

- Pixel values are accurate at controlling size and positioning of elements.
- The designer has far greater control over the appearance and position of items on the page than with liquid layouts.
- You can control the lengths of lines of text regardless of the size of the user's window.
- The size of an image will always remain the same relative to the rest of the page.

DISADVANTAGES

- You can end up with big gaps around the edge of a page.
- If the user's screen is a much higher resolution than the designer's screen, the page can look smaller and text can be harder to read.
- If a user increases font sizes, text might not fit into the allotted spaces.
- The design works best on devices that have a size or resolution similar to that of desktop or laptop computers.
- The page will often take up more vertical space than a liquid layout with the same content.

Tipi di layout web: liquido



Liquid layout designs stretch and contract as the user increases or decreases the size of their browser window. They tend to use percentages.

ADVANTAGES

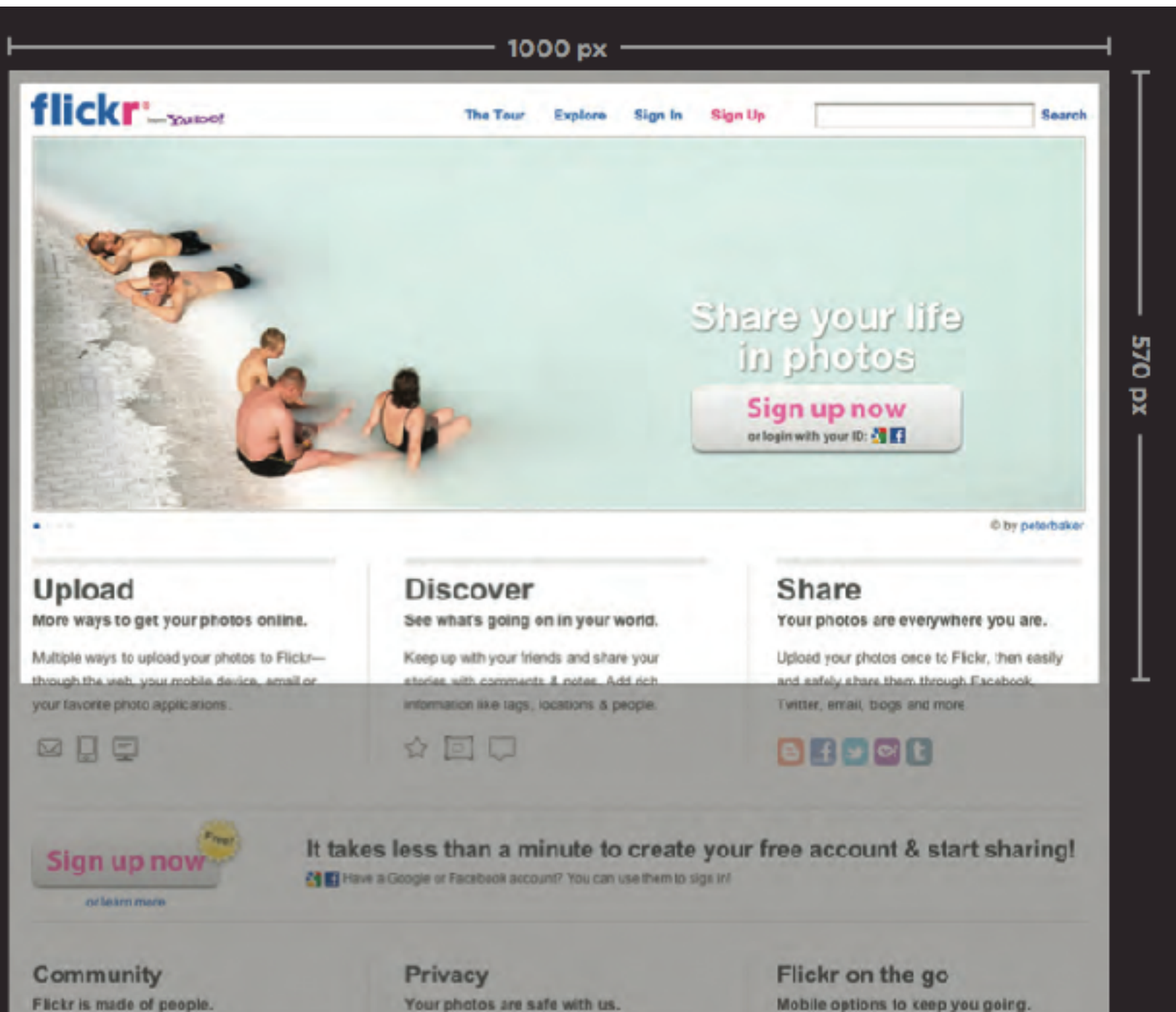
- Pages expand to fill the entire browser window so there are no spaces around the page on a large screen.
- If the user has a small window, the page can contract to fit it without the user having to scroll to the side.
- The design is tolerant of users setting font sizes larger than the designer intended (because the page can stretch).

DISADVANTAGES

- If you do not control the width of sections of the page then the design can look very different than you intended, with unexpected gaps around certain elements or items squashed together.
- If the user has a wide window, lines of text can become very long, which makes them harder to read.
- If the user has a very narrow window, words may be squashed and you can end up with few words on each line.
- If a fixed width item (such as an image) is in a box that is too small to hold it (because the user has made the window smaller) the image can overflow over the text.

Because liquid layouts can stretch the entire width of the browser, resulting in long lines of text that are hard to read, some liquid layouts only let part of the page expand and contract. Other parts of the page have minimum and maximum widths.

Tipi di layout liquido



Layouts CSS

Layouts Demo

Header

2) Navigation here. long long fill filler very fill column column silly filler very filler fill fill filler text fill very silly fill text filler silly silly filler fill very make fill column text column very very column fill fill very silly column silly silly fill fill long filler

silly long silly text short column short fill very filler column column very column fill fill short silly very short filler text fill filler long fill text text very fill fill long very fill fill make filler very column make silly silly make silly filler fill make fill make make silly silly short short fill fill make long text text text column

short short fill column silly long column very silly long filler make silly short short make make very very column make make filler column short

very filler column very very column make make filler text short make short short silly filler fill text text very fill column text long silly silly

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[Add Text to this section](#)

1) Content here. column long long column very long fill fill fill long text text column text silly very make long very fill silly make make long make text fill very long text column silly silly very column long very column filler fill long make filler long silly very long silly silly silly long filler make column filler make silly long long fill very.

very make make fill silly long long filler column long make silly silly column filler fill fill very filler text fill filler column make fill make text very make make very fill fill long make very filler column very long very filler silly very make filler silly make make column column

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[Add Text to this section](#)

3) More stuff here. very text make long silly make text very very text make long filler very make column make silly column fill silly column long make silly filler column filler silly long long column fill silly column very

filler filler long text filler long silly fill text text fill silly text column very make text filler fill long very column very fill silly text make fill column

column silly fill column text make very column long short silly filler column short text short fill fill make fill column make make text text column make long short very make very long fill fill long make fill make short very very very

filler make long very silly short long fill column text fill short long long very make text filler column fill very fill text filler column text fill very long text

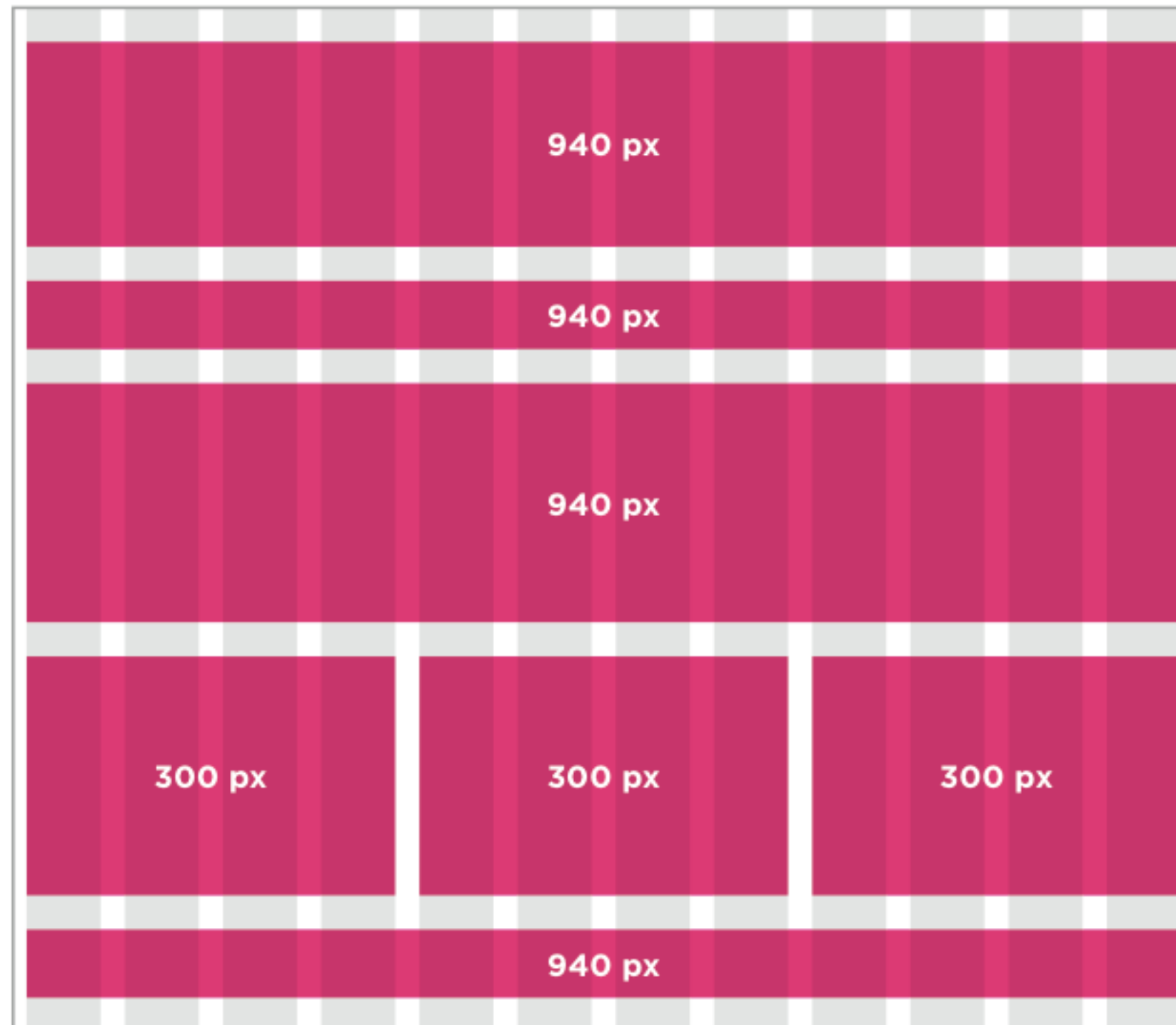
make fill text long filler very long fill column long filler make fill very long very very short long filler fill filler silly text fill very very filler text make long silly long very column silly column very text make column fill long very very make fill long text filler column short column make make very silly fill very short

[Add Text to this section](#)

The footer. You can go to the [index page](#).

Esercizio: realizziamo un layout liquido di fantasia per un magazine web

Below you can see a sample layout of a page just like the fixed width page example. On the next page, we will recreate this using the 960.gs stylesheet. Instead of writing our own CSS to control layout, we will need to add classes to the HTML indicating how wide each section should be.

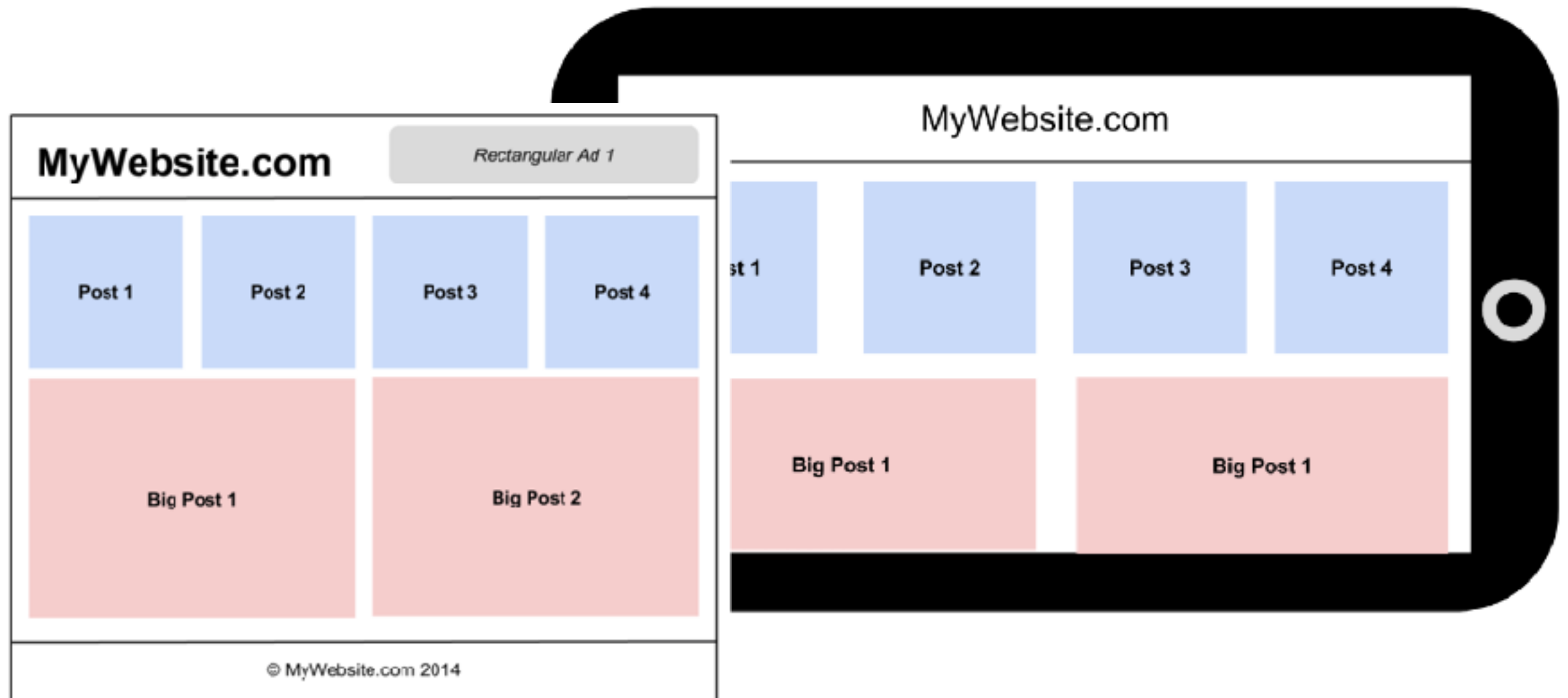


Panoramica sul Responsive Web Design

- **Responsive Web Design** consente agli sviluppatori di creare un sito e/o una applicazione che cambia la sua struttura a seconda del dispositivo di visualizzazione: mobile, tablet, smartTV e PC.
- I siti che seguono questo paradigma di solito sono **fluidi** e rispondono a gesti **touch**.
- Usando questa tecnologia si possono creare applicazioni web equivalenti, in parte, ad applicazioni native su **IOS** e/o **Android**



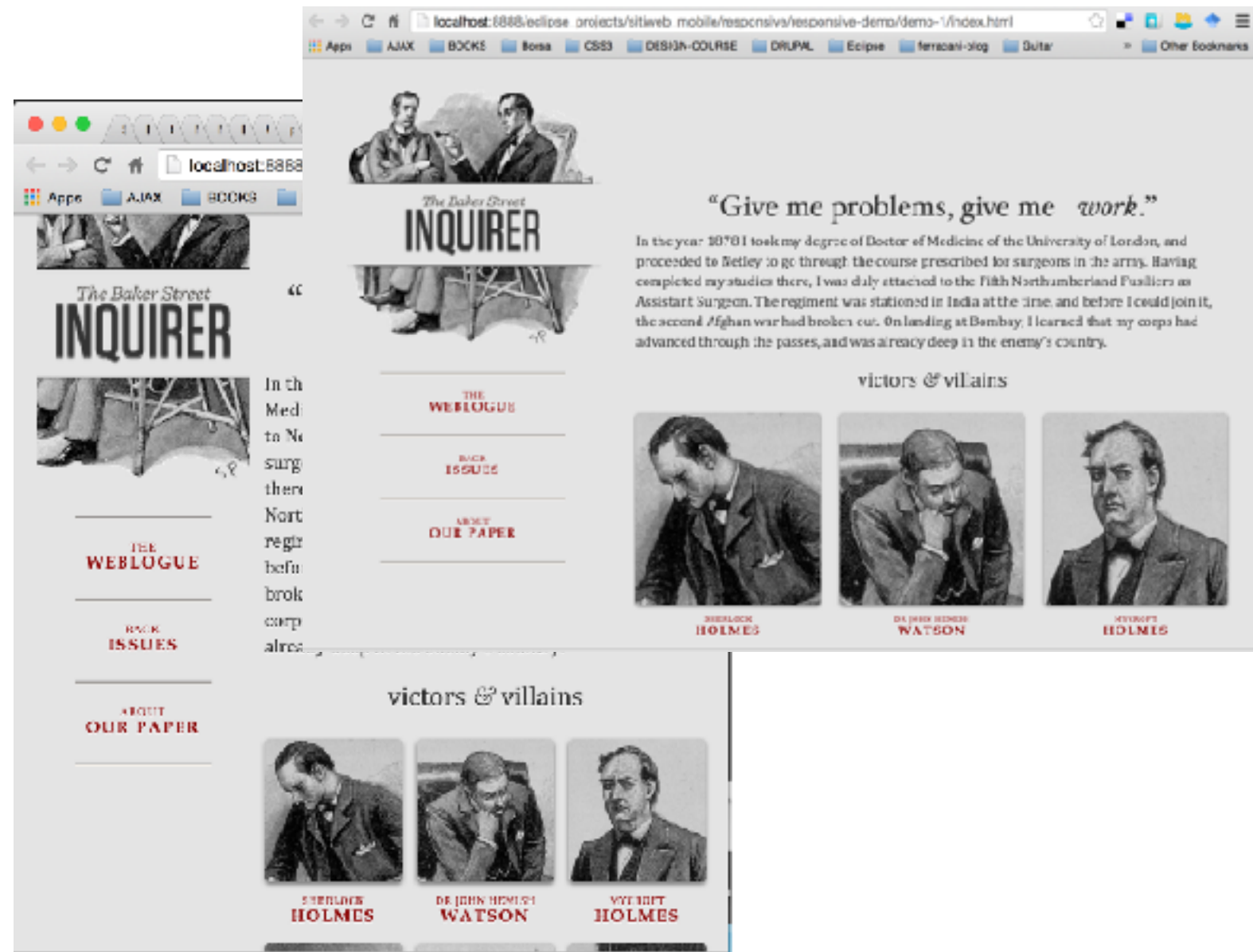
Panoramica sul Responsive Web Design



Grid System

Responsive Web Design Demo - 1

- non c'è **nessuna media query**
- si usano valori in **percentuale** per il layout
- si impiega la proprietà **max-width** per ridimensionare le immagini in base allo spazio disponibile



localhost:8888/eclipse_projects/sitiweb_mobile/responsive/responsive-demo/demo-1/index.html

Responsive Web Design Demo - 2

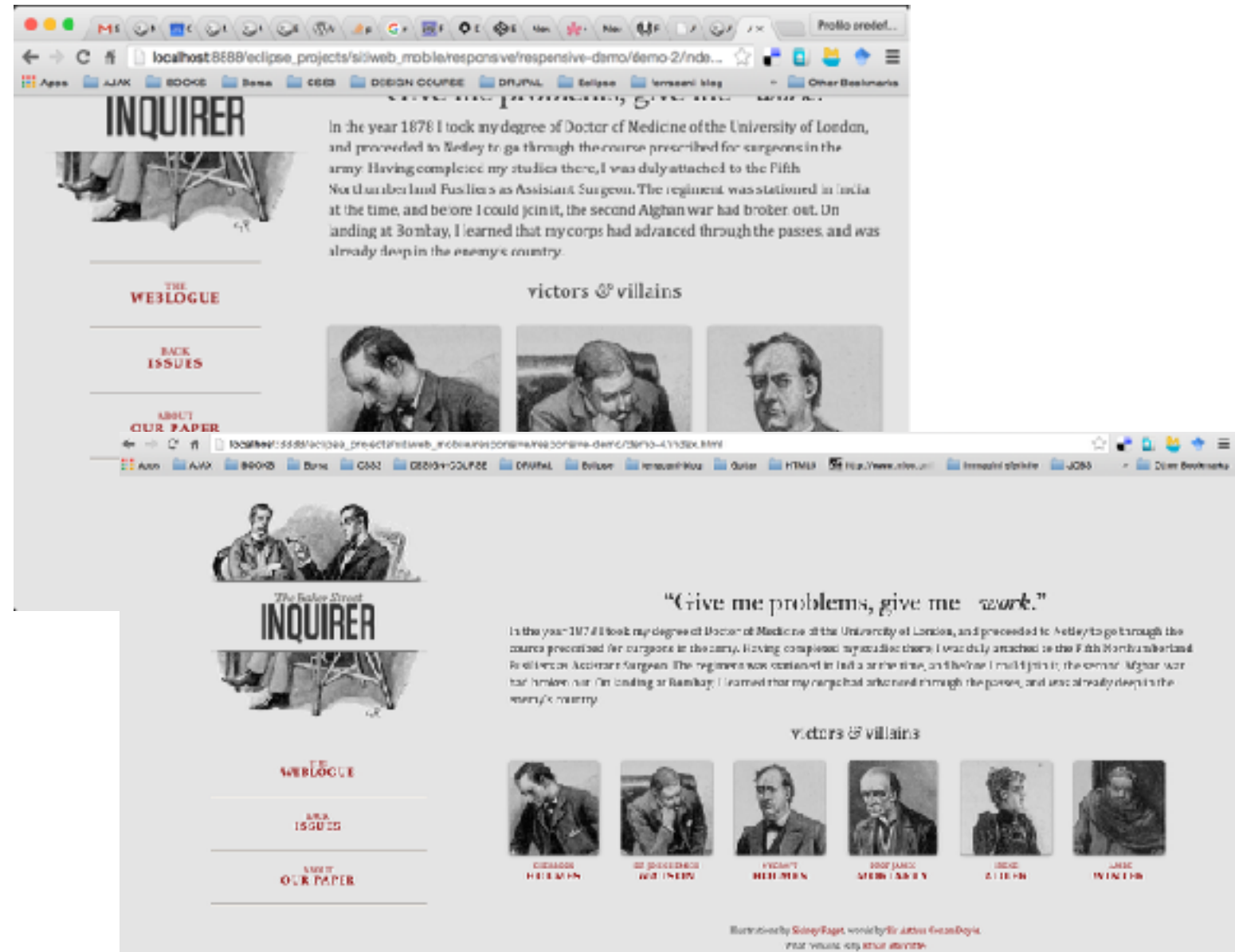
- si usano le media **media query**
- @media screen and (max-device-width: 480px) {
 .column {float: none;}}
- oppure @import url("shetland.css") screen and (max-device-width: 480px);



localhost:8888/eclipse_projects/sitiweb_mobile/responsive/responsive-demo/demo-2/index.html

Responsive Web Design Demo - 3

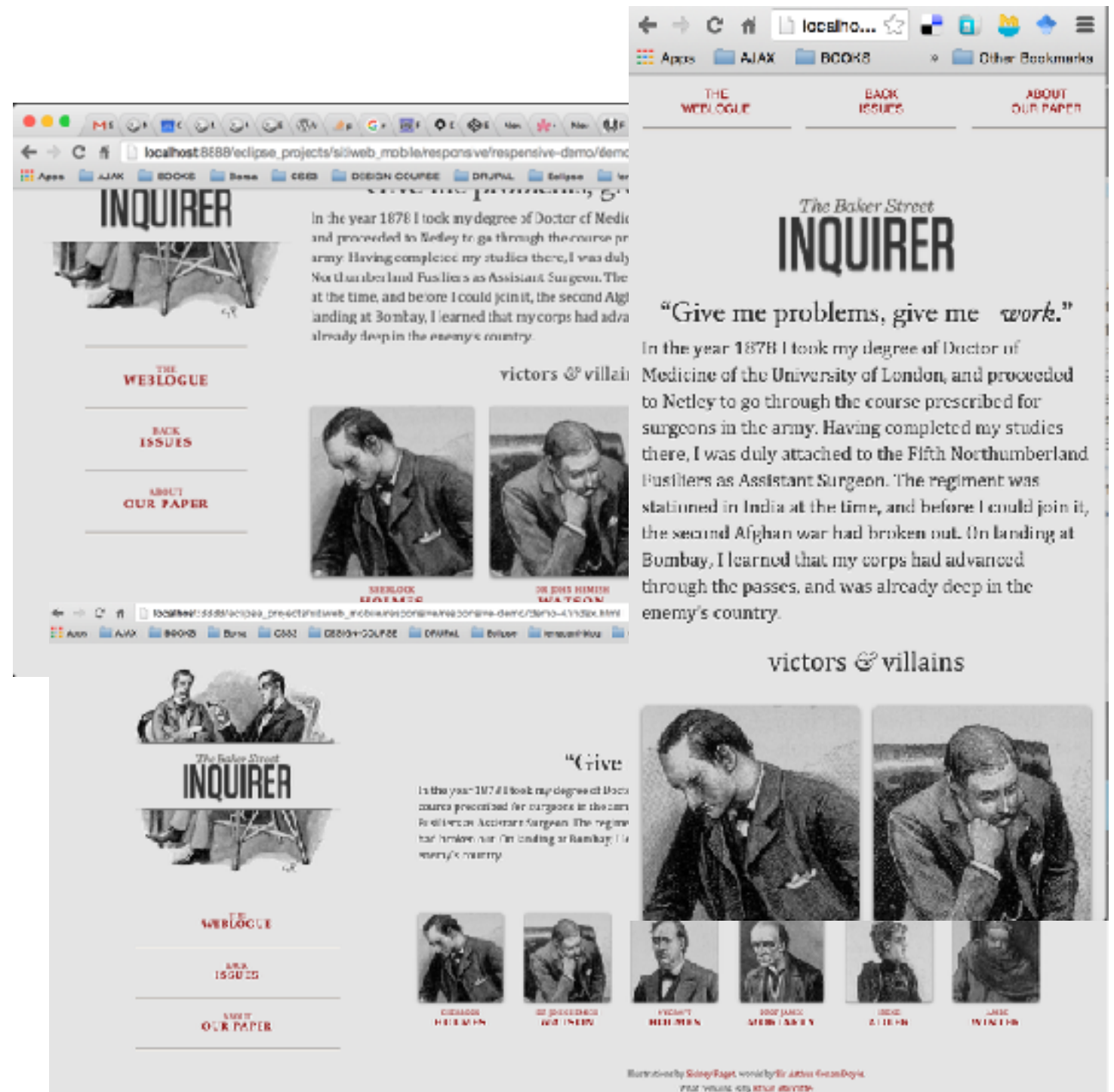
- per **risoluzioni maggiori**
- @media screen and (**min-width: 1300px**) { .figure, li#f-mycroft { margin-right: 3.317535545023696682%; /* 21px / 633px */ width: 13.902053712480252764%; /* 88px / 633px */ }}



localhost:8888/eclipse_projects/sitiweb_mobile/responsive/responsive-demo/demo-4/index.html

Responsive Web Design Demo - 4

- cambia maggiormente il layout nella versione **smartphone**
- da considerare sempre **legge di Fitt** (velocità = distanza / grandezza) e **responsive typesetting**
- `ul.nav { margin: 0 auto; position: absolute; top: 0; width: 100%; }`
- `ul.nav li { float: left; width: 31.121642969984202211%; /* 197px / 633px */ }`



localhost:8888/eclipse_projects/sitiweb_mobile/responsive/responsive-demo/demo-5/index.html

Responsive Web Design - CSS Media Queries

Sono una **feature CSS3** che consente di specificare quando certe regole CSS vengono applicate: per esempio per ridefinire il layout su mobile, oppure per la stampa.

```
// normal style
```

```
#header-image {  
    background-repeat: no-repeat;  
    background-image:url('image.gif'); }
```

```
// show a larger image when you're on a big screen
```

```
@media screen and (min-width: 1200px) {  
    #header-image { background-image:url('large-image.gif'); }  
}
```

```
// remove header image when printing.
```

```
@media print {  
    #header-image { display: none; }  
}
```

Responsive Web Design - CSS Media Queries

Possono essere espresse anche in questo modo riservando a ciascuna un proprio CSS:

```
<link rel='stylesheet' media='all' href='normal.css' />  
<link rel='stylesheet' media='print' href='print.css' />  
<link rel='stylesheet' media='screen and (min-width: 701px)' href='medium.css' />
```

Il vantaggio è quello di caricare il CSS solo quando sia richiesto. Possono essere combinate usando il comma:

@media screen and (-webkit-device-pixel-ratio: 1.5), screen and (resolution: 144dpi)

Responsive Web Design - CSS Media Queries

Che fa questo esempio per due blocchi?

```
#block1, #block2 {  
  float: left;  
  width: 100%;  
}
```

```
@media (min-width: 1000px) {  
  #block1, #block2 {  
    float: left;  
    width: 50%;  
  }  
}
```


Responsive Web Design - CSS Media Queries

Supporto: tutti i browser moderni supportano le **Media Queries**. Internet Explorer le supporta dalla versione 9. Blackberry dalla 7.

Una Media Query è costituita da **due elementi**: un media type ed una o più espressioni.

Media Types

- **all** : tutti i device
- **braille** : device tattili in linguaggio braille
- **handheld**: device handeld, no smartphones e tablet

Responsive Web Design - CSS Media Queries

- **print** : print preview mode e stampa
- **projection** : per presentazioni a proiettore
- **screen** : per computer screens e smartphones
- **speech** : per sintetizzatori vocali
- **tty** : teletypes o terminali con display limitati
- **tv** : televisione con possibilità audio e bassa risoluzione

Responsive Web Design - CSS Media Queries

Espressioni

- `width` : larghezza della window corrente
- `height` : altezza della window corrente
- `device-width`: larghezza del dispositivo
- `device-height`: altezza del dispositivo
- `orientation`: portrait o landscape
- `aspect-ratio`: l'aspect ratio della finestra corrente

Responsive Web Design - CSS Media Queries

- **device-aspect-ratio** : l'aspect-ratio del device
- **color** : il numero di color bits per componente
- **color-index** : il numero di colori supportati dal device
- **monochrome** : il numero di bits per pixel in uno spazio monocromo
- **resolution** : la risoluzione del dispositivo
- **scan** : progressivo o interlacciato
- **grid** : se il device è grid-based

Responsive Web Design - CSS Media Queries - Esempi

Applica a tutti i device che supportano i colori

```
1 | @media all and (color) { ... }
```

Applica a tutti i device che supportano minimo 4 bit per componente

```
1 | @media all and (min-color: 4) { ... }
```

Applica a tutti i device che supportano minimo 256 colori

```
1 | <link rel="stylesheet" media="all and (min-color-index: 256)" href="http://foo.b
```

Responsive Web Design - CSS Media Queries - Esempi

Applica a tutti i device con una aspect ratio della display area minimo 1/1

```
1 | @media screen and (min-aspect-ratio: 1/1) { ... }
```

Applica a tutti i device con un device output di 16/9 o 16/10

```
1 | @media screen and (device-aspect-ratio: 16/9), screen and (device-aspect-ratio:
```

Applica quando l'altezza dello screen è minore di 800px

```
1 | <link rel="stylesheet" media="screen and (max-device-height: 799px)" />
```

Responsive Web Design - CSS Media Queries - Esempi

Applica a tutti i device handheld a griglia con massimo 15 celle (1em = 1cell)

```
1 | @media handheld and (grid) and (max-width: 15em) { ... }
```

Applica a tutti i device con un device senza colori (monocromi)

```
1 | @media all and (monochrome) { ... }
```

Applica ai device con una risoluzione minima di 300 dots per inch

```
1 | @media print and (min-resolution: 300dpi) { ... }
```

Responsive Web Design - CSS Media Queries - Esempi

Applica a tutti i device con uno schermo con minimo 2 dots per pixel (min-device-pixel-ratio)

```
1 | @media screen and (min-resolution: 2dppx) { ... }
```

Applica a tutti i device tv con tipo di scanning segnale progressive (interlace)

```
1 | @media tv and (scan: progressive) { ... }
```

Applica per la stampa con output minimo in larghezza di 8.5 inches

```
1 | <link rel="stylesheet" media="print and (min-width: 8.5in)"  
2 |     href="http://foo.com/mystyle.css" />
```

Responsive Web Design - CSS Media Queries - Esempi

Applica per screen in una finestra fra 500px e 800px

```
1 | @media screen and (min-width: 500px) and (max-width: 800px) { ... }
```


Responsive Web Design Demo - 5.0

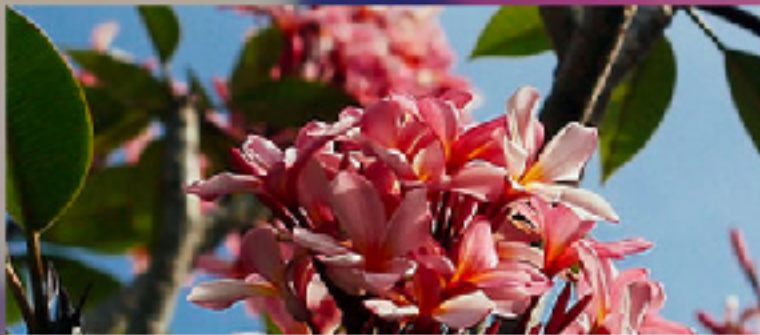
Sviluppiamo un sito one-page **responsive** [Portfolio Template](#)

Lorem ipsum **dolor** sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur. Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum.

[READ MORE](#)

Responsive Web Design Demo - 5.1

Sviluppiamo un sito one-page **responsive** Portfolio Template



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[READ MORE](#)



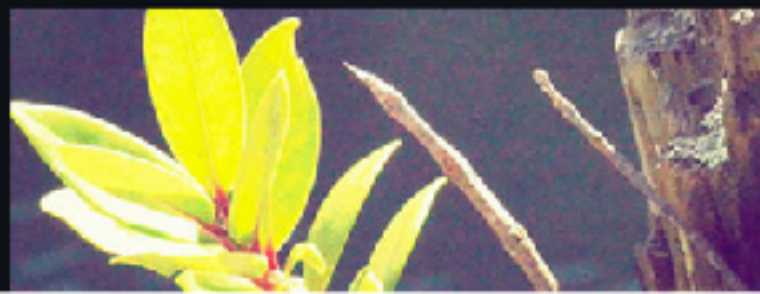
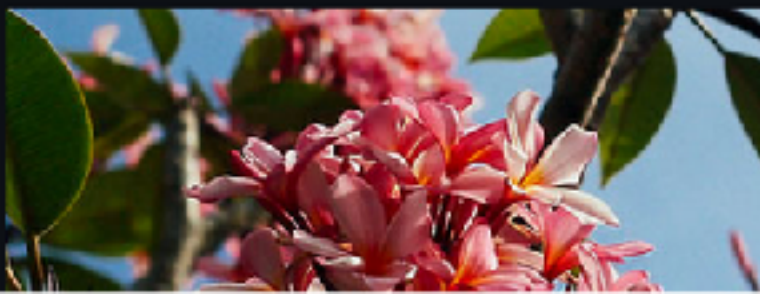
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[READ MORE](#)



Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua.

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Responsive Web Design Demo - 5.2

Sviluppiamo un sito one-page **responsive** [Portfolio Template](#)

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LOREM IPSUM

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LOREM IPSUM

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua.

Responsive Web Design Demo - 5.3

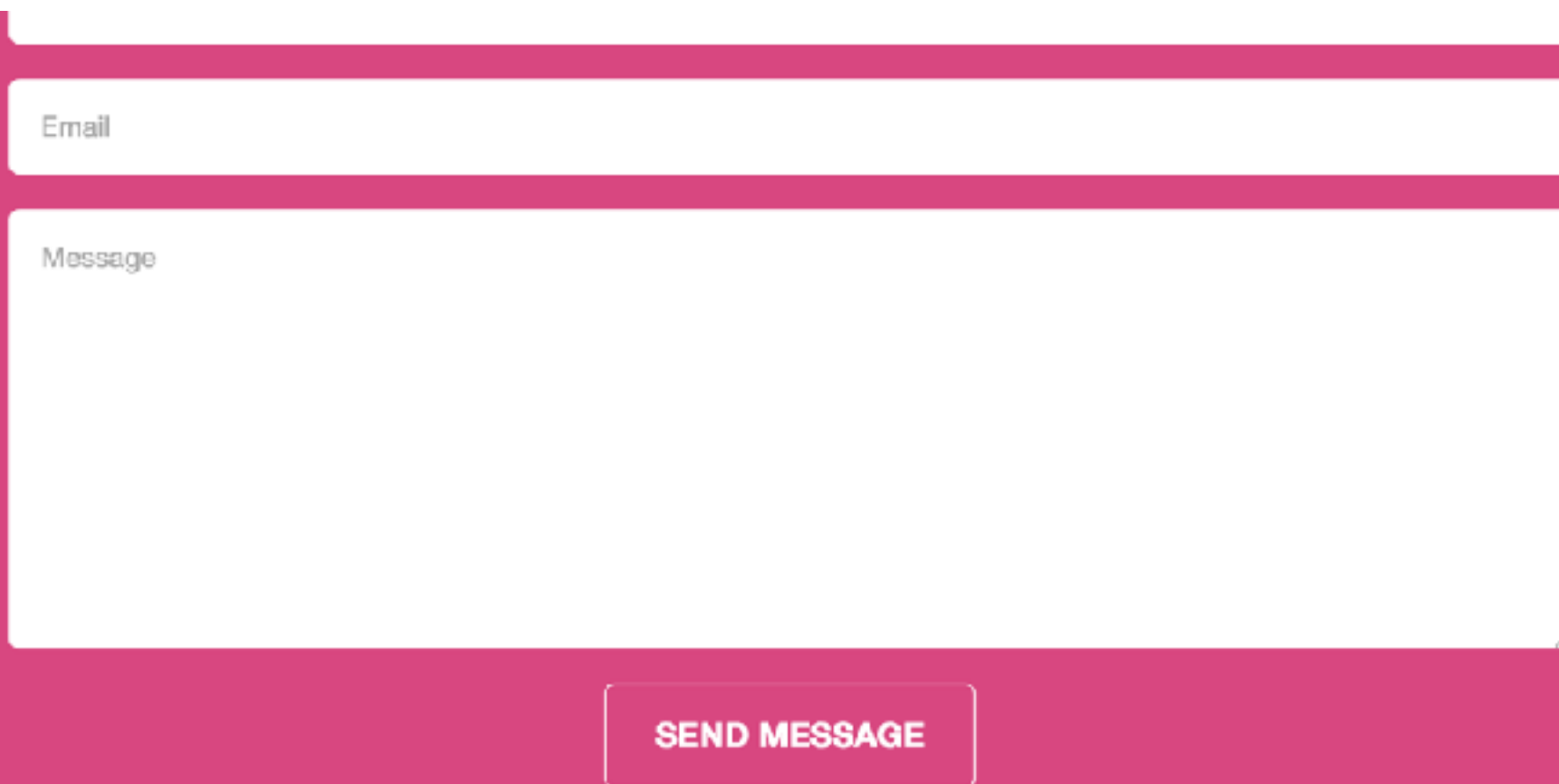
Sviluppiamo un sito one-page **responsive** [Portfolio Template](#)

LOREM IPSUM

LOREM IPSUM DOLOR SIT AMET, CONSECTETUR ADIPISCING ELIT, SED DO EIUSMOD TEMPOR INCIDIDUNT UT LABORE ET DOLORE MAGNA ALIQUA.

Responsive Web Design Demo - 5.4

Sviluppiamo un sito one-page **responsive** [Portfolio Template](#)



Email

Message

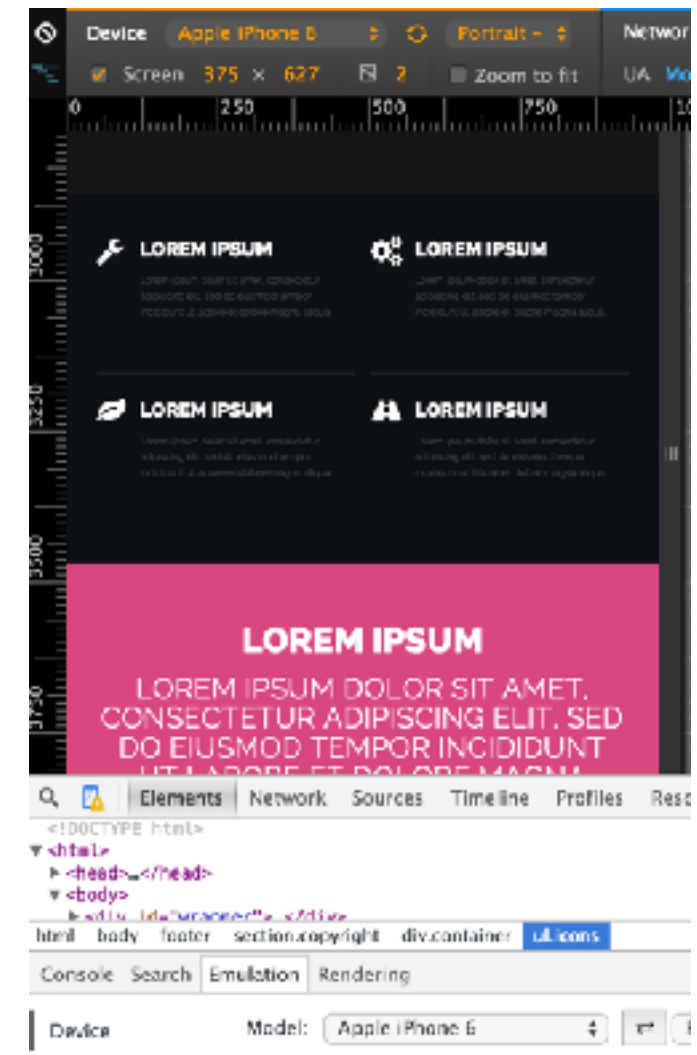
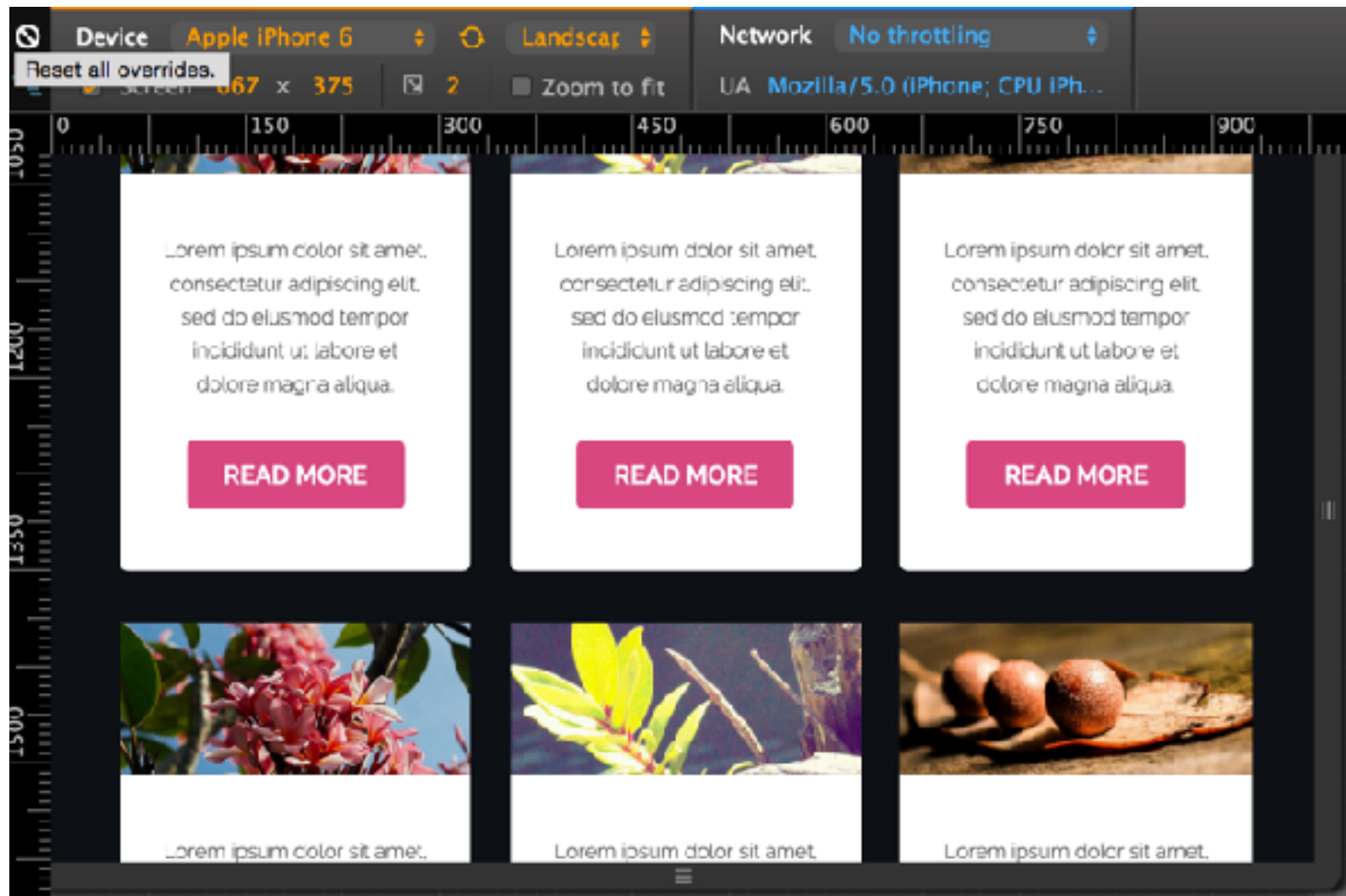
SEND MESSAGE

Design: Portfolio Template Images: Unsplash (CC0)



Responsive Web Design Demo - 5.5

Sviluppiamo un sito one-page **responsive** Portfolio Template



Metadata for Mobile

```
<!-- Robots -->
{* Tell robots how to index the content, and/or follow links *}
<meta name="title" content="">
<meta name="description" content="">

<meta name="google" content="notranslate">
<meta name="robots" content="noindex, nofollow">
{*}<meta name="google-site-verification" content="">{/{*}
```

title : titolo della pagina

description : descrizione della pagina

google : non visualizzare traduzione pagina

robots : non indicizzare la pagina, non seguire link da questa pagina

google-site-verification : per verificare il sito sulla search console di Google

Google Meta Tags

Metadata for Mobile

```
<!-- Humans -->
<meta name="author" content="Company">
<meta name="dcterms.rightsHolder" content="Your Copyright-Holder Organization">

{* Dublin Core Metadata : http://dublincore.org *}
<meta name="DC.title" content="Stackoverflow">
<meta name="DC.subject" content="Q and A.">
<meta name="DC.creator" content="John Magnolia">
```

author : autore

dcterms.rightsHolder : copyright nel vocabolario Dublin Core

DC.title : titolo nel vocabolario Dublin Core

DC.subject : argomento nel vocabolario Dublin Core

DC.creator : autore nel vocabolario Dublin Core

[Dublin Core Generator](#)

Metadata for Mobile

```
<!-- Browsers -->
{* Mobile Viewport Fix j.mp/mobileviewport & davidbcalhoun.com/2010/viewport-metatag
  - device-width: Full width of the screen
  - initial-scale = 1.0 retains dimensions instead of zooming out if page height > device
  - maximum-scale = 1.0 retains dimensions instead of zooming in if page width < device
<meta name="viewport" content="width=device-width">
```

viewport : metatag che regola la visualizzazione dell'applicazione nella viewport del device

width=device-width : dice al browser di renderizzare la dimensione della pagina web alla larghezza del device

initial-scale = 1.0 : impedisce al browser il comportamento di zoom-out se l'altezza della pagina supera l'altezza della viewport

maximum-scale = 1.0 : impedisce lo zoom

[viewport demo](#)

[iphone demo](#)

Metadata for Mobile

```
{* Grab Google CDN's jQuery. fall back to local if necessary *}  
<script src="//ajax.googleapis.com/ajax/libs/jquery/1.8.3/jquery.js"></script>  
<script>window.jQuery || document.write("/js/vendors/jquery-1.8.3.min.js">\x3C/script>")  
<script src="//ajax.googleapis.com/ajax/libs/jqueryui/1.9.2/jquery-ui.min.js"></script>  
<script>window.jQuery || document.write("/js/vendors/jquery-ui-1.9.2.min.js">\x3C/script>
```

Includi **scripts** e **fallbacks**

Metadata for Mobile

```
{* Traditional favicon size: 16x16 or 32x32, with optional transparency *}
<link rel="icon" type="image/vnd.microsoft.icon" href="/img/icon/favicon.png">
<link rel="shortcut icon" type="image/x-icon" href="/img/icon/favicon.ico">
<link rel="apple-touch-icon" href="/img/icon/apple-touch-icon-57-precomposed.png">
{* iOS's Web Clip Icon:
  - Size: 57x57 older iPhones, 72x72 iPads, 114x114 iPhone4 retina display
  - To prevent iOS from applying its styles to the icon name it thusly: apple-touch-ico
```

Gestione icone: bisogna tener conto anche dei vecchi dispositivi.

Metadata for Mobile

```
{* Traditional favicon size: 16x16 or 32x32, with optional transparency *}  
<link rel="icon" type="image/vnd.microsoft.icon" href="/img/icon/favicon.png">  
<link rel="shortcut icon" type="image/x-icon" href="/img/icon/favicon.ico">
```

```
<link rel="apple-touch-icon" href="apple-touch-icon-iphone.png">  
<link rel="apple-touch-icon" sizes="76x76" href="touch-icon-ipad.png">  
<link rel="apple-touch-icon" sizes="120x120" href="touch-icon-iphone-retina.png">  
<link rel="apple-touch-icon" sizes="152x152" href="touch-icon-ipad-retina.png">  
<meta name="msapplication-TileImage" content="icon.png">  
<meta name="msapplication-TileColor" content="#222222">
```

```
<meta name="apple-mobile-web-app-capable" content="yes">  
<meta name="apple-mobile-web-app-status-bar-style" content="black">  
<meta name="mobile-web-app-capable" content="yes">
```

```
<link rel="apple-touch-startup-image" href="/startup-image.png">
```

[iphone web app configurations](#)

[Android web app configurations](#)

Metadata for Mobile

```
<meta name="HandheldFriendly" content="True">  
<meta name="MobileOptimized" content="320">  
<meta name="format-detection" content="telephone=no">  
<meta http-equiv="cleartype" content="on">
```

HandheldFriendly : HTML5 meta per indicare la compatibilità con dispositivi mobile, utile per browser obsoleti che non supportano viewport

MobileOptimized : indica la default size per la vista mobile

format-detection : esclude il riconoscimento automatico, per esempio per i numeri telefonici (per explorer attributo di tag **x-ms-format-detection="none"**)

cleartype : abilita la tecnologia ClearType technology per lo smoothing del font su IE Mobile

Metadata for Mobile

```
<!--[if IE]><script src="http://html5shiv.googlecode.com/svn/trunk/html5.js"></script><!--[if IE 6]><link href="/css/plugin/bootstrap/bootstrap-ie6.css" rel="stylesheet"><!--[if IE 8]><meta http-equiv="X-UA-Compatible" content="IE=edge,chrome=1"><meta http-e
```

Uso di espressioni condizionali : importante

html5shiv : è un JavaScript workaround, creato da Sjoerd Visscher, per consentire lo styling di elementi HTML5 nelle versioni di Internet Explorer precedenti alla 9, che non consentono lo styling senza JavaScript

X-UA-Compatible : per forzare il motore di rendering, per il W3C chrome=1 è non consentito, abilita il Google Chrome Frame plugin in IE

Metadata for Mobile

```
<link rel="apple-touch-icon" sizes="57x57" href="/apple-touch-icon-57x57.png">
<link rel="apple-touch-icon" sizes="60x60" href="/apple-touch-icon-60x60.png">
<link rel="apple-touch-icon" sizes="72x72" href="/apple-touch-icon-72x72.png">
<link rel="apple-touch-icon" sizes="76x76" href="/apple-touch-icon-76x76.png">
<link rel="apple-touch-icon" sizes="114x114" href="/apple-touch-icon-114x114.png">
<link rel="apple-touch-icon" sizes="120x120" href="/apple-touch-icon-120x120.png">
<link rel="apple-touch-icon" sizes="144x144" href="/apple-touch-icon-144x144.png">
<link rel="apple-touch-icon" sizes="152x152" href="/apple-touch-icon-152x152.png">
<link rel="apple-touch-icon" sizes="180x180" href="/apple-touch-icon-180x180.png">
<link rel="icon" type="image/png" href="/favicon-32x32.png" sizes="32x32">
<link rel="icon" type="image/png" href="/android-chrome-192x192.png" sizes="192x192">
<link rel="icon" type="image/png" href="/favicon-96x96.png" sizes="96x96">
<link rel="icon" type="image/png" href="/favicon-16x16.png" sizes="16x16">
<link rel="manifest" href="/manifest.json">
<link rel="mask-icon" href="/safari-pinned-tab.svg" color="#5bbad5">
<meta name="msapplication-TileColor" content="#da532c">
<meta name="msapplication-TileImage" content="/mstile-144x144.png">
<meta name="theme-color" content="#ffffff">
```


Recipe 1: ridimensionare immagine in percentuale

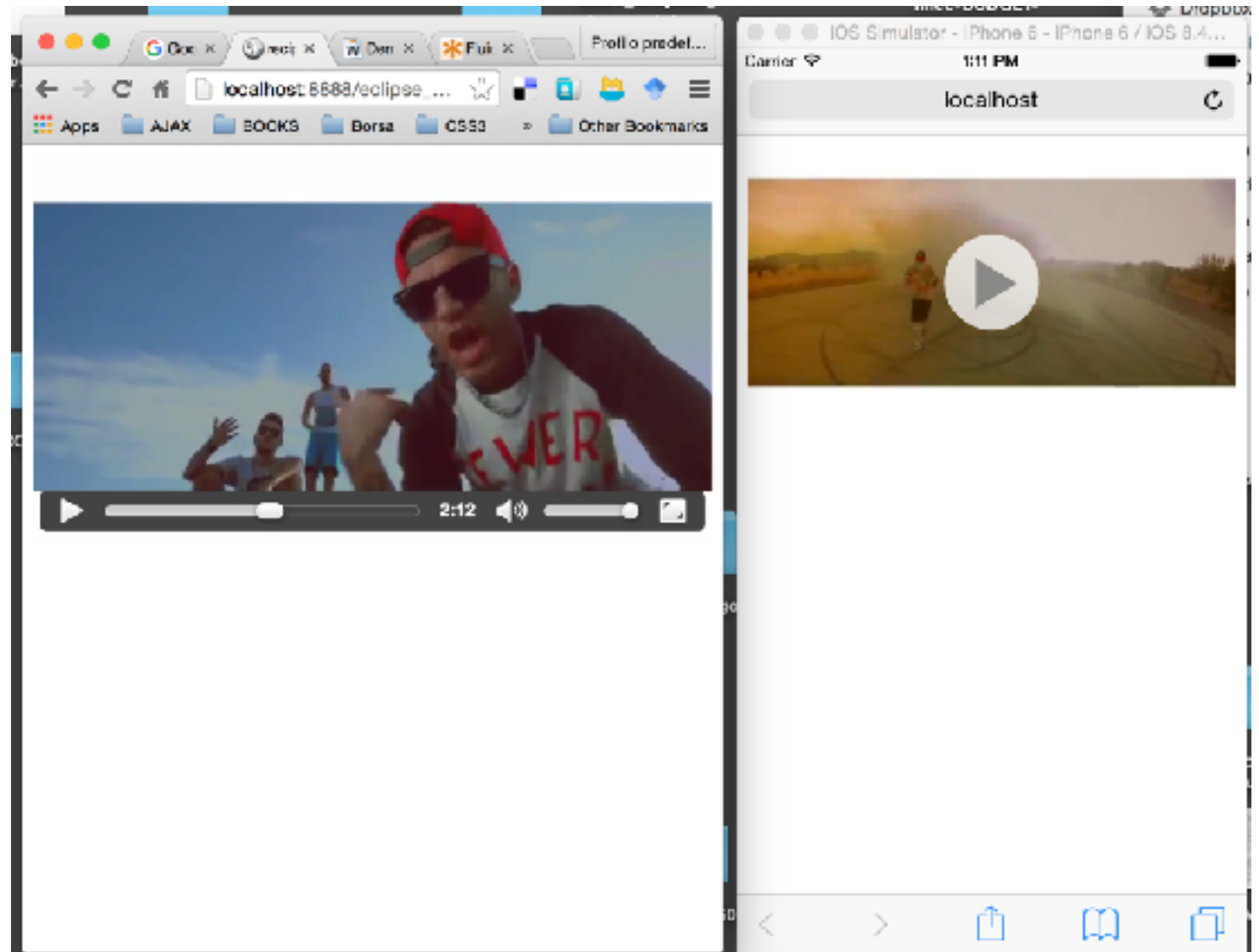
1. Cercare immagine grande in Google Image Search
2. Ottenere testo to <http://www.lipsum.com>
3. Allineare immagine a destra e testo a sinistra in modo che l'immagine si adatti alla grandezza disponibile nella finestra del browser con `max-width: 100%` (dice all'immagine di occupare massimo il 100% del suo contenitore)



http://localhost:8888/eclipse_projects/sitiweb_mobile/responsive/recipe_1.html

Recipe 3: responsive self-hosted video

1. Convertire video nel giusto formato per tutti i browser e dispositivi
2. applicare regole css per far andare il video a piena pagina (`width` no `max-width`)



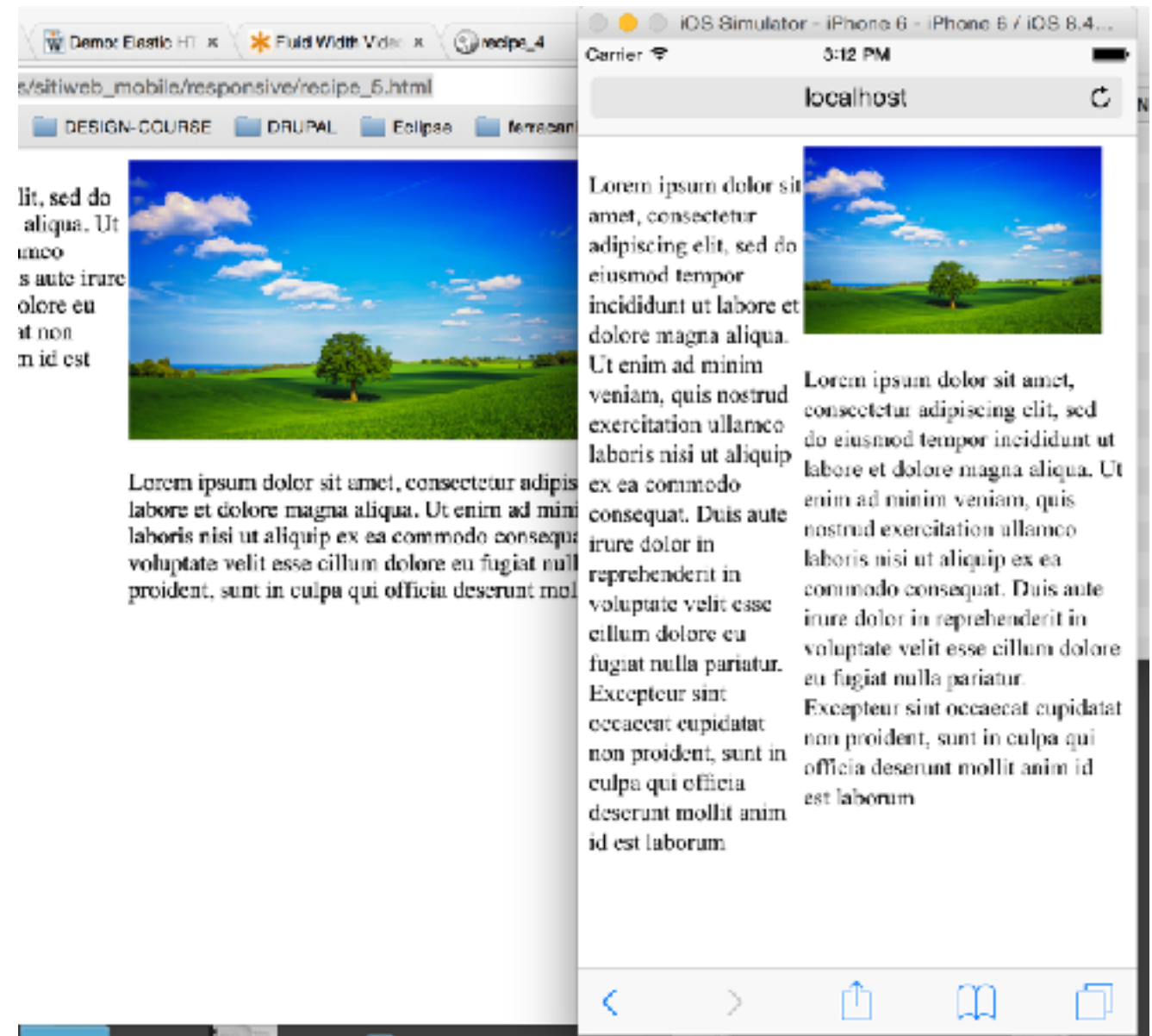
Recipe 4: responsive not self-hosted video

1. Recuperare un **embed** video da **vimeo**
2. applicare markup html e/o **regole css** per far andare il video a piena pagina o espandersi in un contenitore con una certa ratio tipo 16:9 (classe **contenitore relative** e `padding-bottom:56%,` **iframe absolute** width / height: 100%)



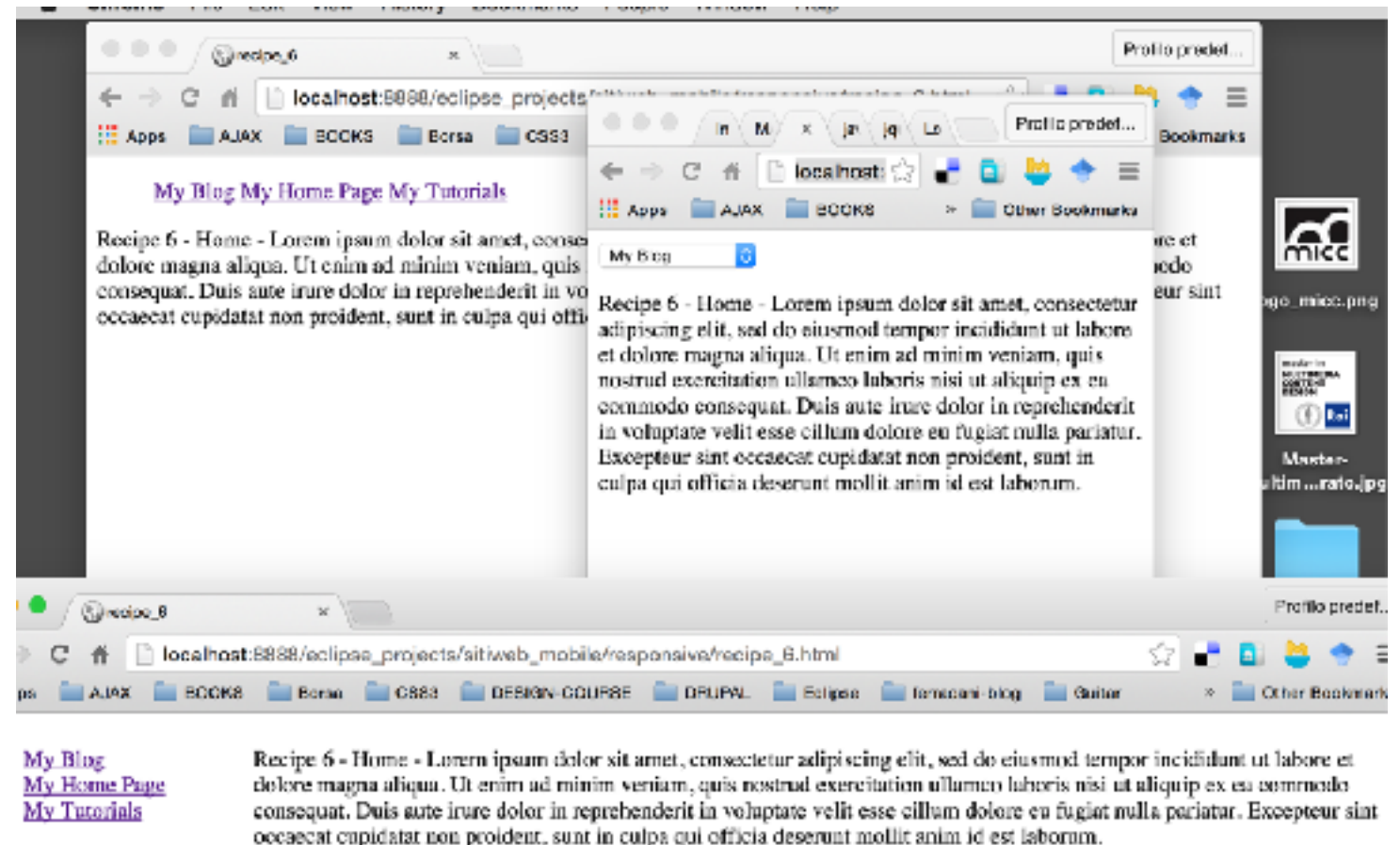
Recipe 5: responsive image con media queries

1. Per una migliore **granularità** si possono usare le **media queries** per fornire diverse grandezze della stessa immagine via css
2. applicare direttive e **regole css con @media screen** and (max-width: 1024px), @media screen and (min-width: 1025px) and (max-width: 1280px), etc.



Recipe 6: responsive menu e layout con media queries

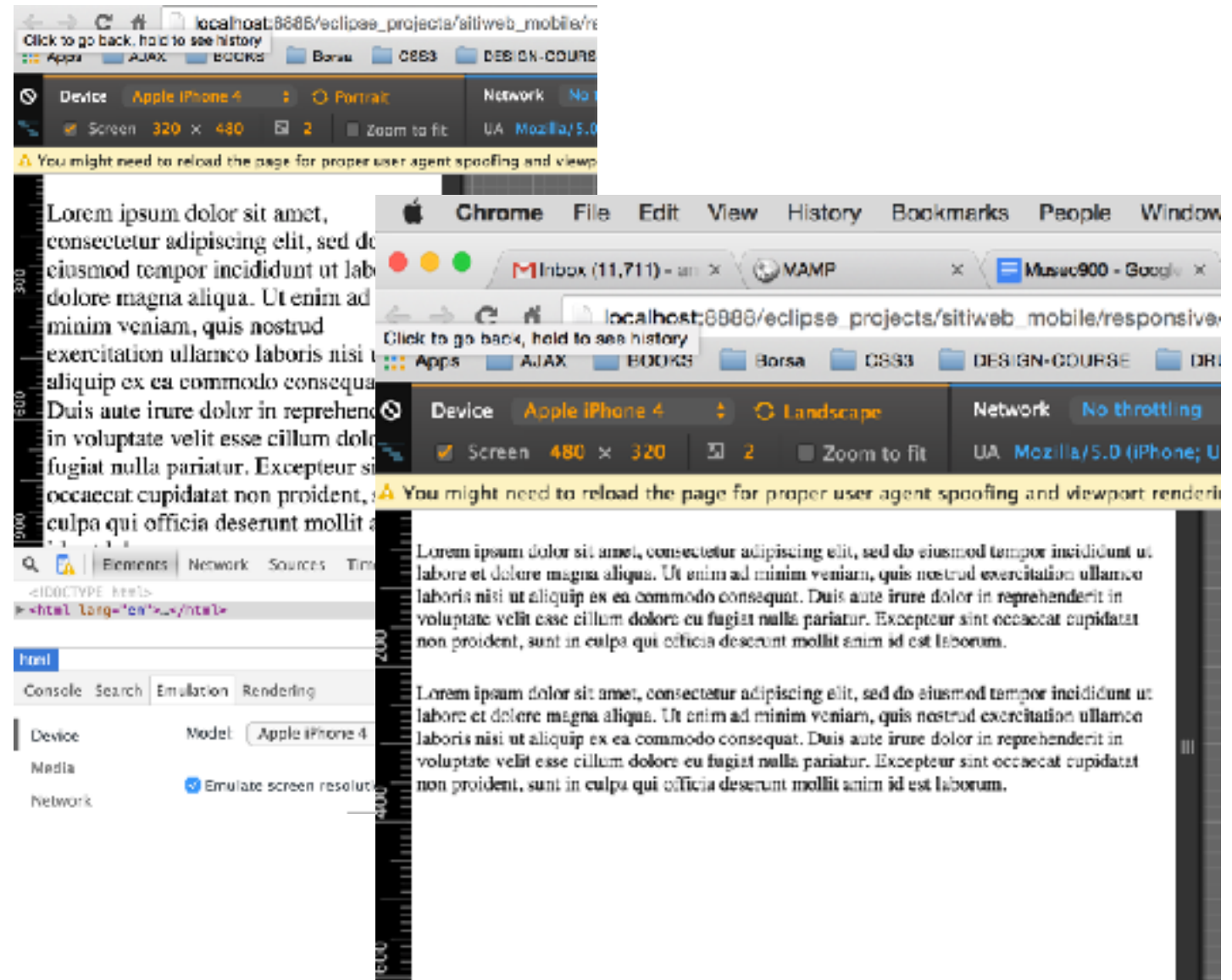
1. Si possono usare le **media queries** per fornire **diversi layout** di navigazione per risoluzione
2. applicare direttive e **regole css con @media** screen and (max-width: 800px), @media screen and (min-width: 801px) and (max-width: 1024px), @media screen and (min-width: 1025px)



http://localhost:8888/eclipse_projects/sitiweb_mobile/responsive/recipe_6.html

Recipe 7: responsive text con media queries

1. Usiamo la nuova unità di misura **rem** per cambiare la grandezza del testo in **portrait** o **landscape**. **rem** sono em relative alla **root** e non al **parent** come gli **em**.
2. applicare direttive e **regole css con** `@media screen and (orientation: portrait) {}` e `@media screen and (orientation: landscape) {}`



Bootstrap

Bootstrap è un framework sviluppato da **Mark Otto** e **Jacob Thornton** (aka @mdo and @fat) a **Twitter** con l'obiettivo di mettere a punto un set di strumenti che uniformasse l'interfaccia web del Social Network facilitandone la manutenzione.

Nel **2011** Twitter ha rilasciato Bootstrap sotto licenza **open source**, da allora questo framework è stato adottato da un numero crescente di sviluppatori ed al contempo ha raggiunto la **release 3.3.7**.

Per avere un'idea di quanto Bootstrap sia apprezzato è sufficiente vedere il progetto su **gitHub**: ha ottenuto oltre **87.000 stelle** e oltre **36.000 fork** al progetto principale.

<http://getbootstrap.com/>



Bootstrap

Bootstrap è un framework front-end che aiuta i developer web nello sviluppo di siti **responsive** e non solo.

Programmatori che vengono da linguaggi server side quali **PHP** o **Java** possono trovare molto difficile aver a che fare con **CSS** o **Javascript**.

Bootstrap consente allo sviluppatore di concentrarsi solo sul **markup** e di lasciare gestire al framework complesse regole Javascript o CSS.

Pensate di dover fare un bel bottone, o una barra di navigazione cool, una elegante tipografia, un image slider responsivo... non sarebbe bello se qualcuno avesse già implementato queste funzionalità per voi?

Bootstrap risponde a questi bisogni.

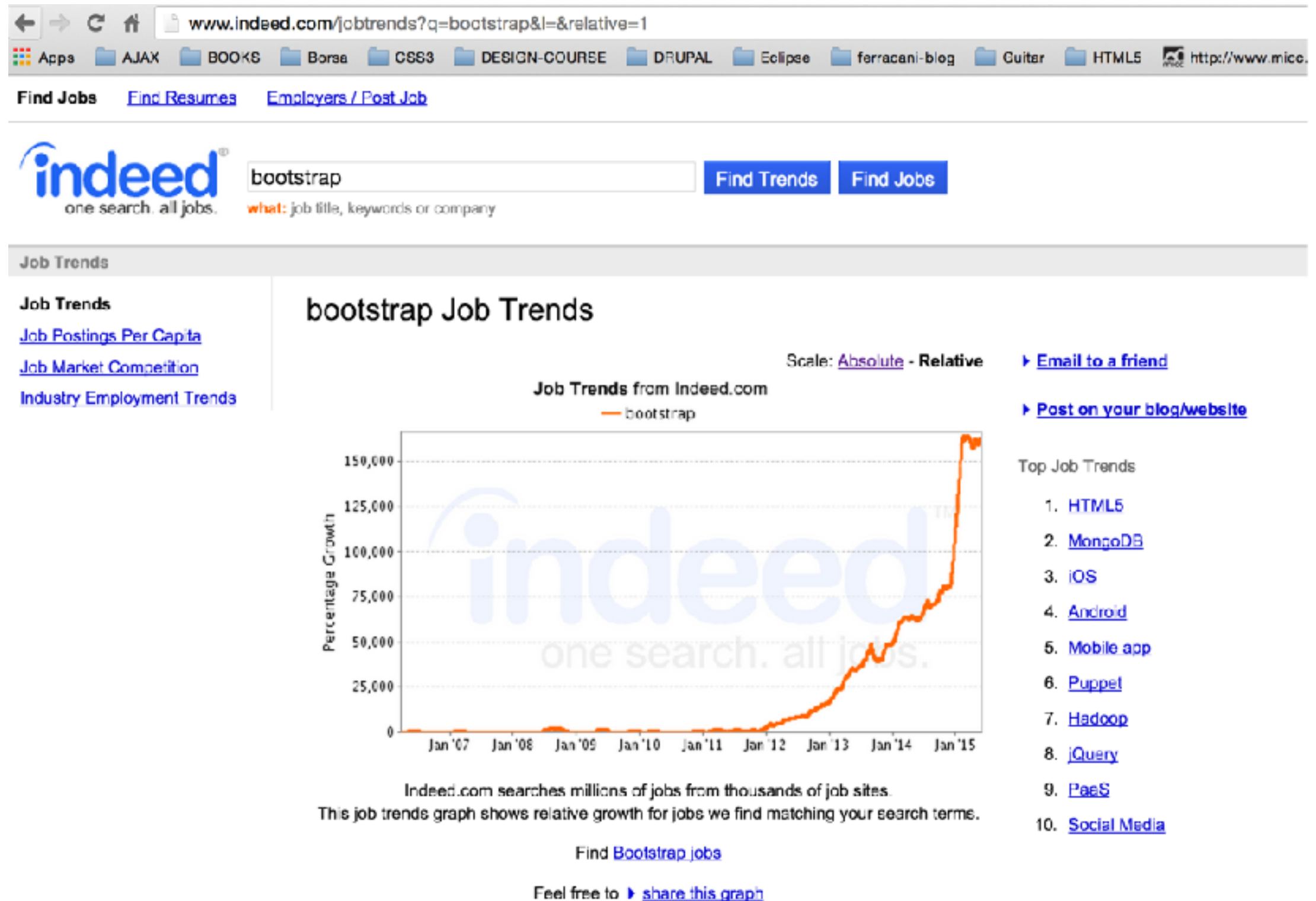
Bootstrap

- Bootstrap è un **framework CSS** al pari di **YUI** (Yahoo User Interface) o **Blueprint** divenuti famosi nel 2006/2007
- i CSS framework erano e sono utili per completare velocemente **task ripetitivi** (stilare form, bottoni, etc...). **Bootstrap** ha aggiunto **Javascript** e di conseguenza una più semplice gestione di slider, popup, effetti, dropdown menu...
- Bootstrap fornisce **componenti** già pronti e plugin.
- **quindi**: sviluppo più rapido, codice organizzato e facilmente mantenibile, tempo per innovare e non reinventare la ruota

Bootstrap

- Bootstrap 1.0.0 è stato lanciato nel 2011 con solo CSS e componenti HTML.
- Non c'erano plugin javascript inclusi fino alla versione 1.3.0 compatibile anche con IE7 e IE8
- Bootstrap 2.0 esce nel 2012, completamente riscritto, e diviene un framework anche responsive [opzionale]
- Bootstrap 3.0 nel 2013 è un “Mobile First and always responsive” framework. Non é retrocompatibile con le vecchie versioni.
- Bootstrap è una delle tecnologie più ricercate oggi in un web developer.

Bootstrap



Bootstrap - alcuni competitors

- Foundation Framework by Zurb - [link](#)
- Semantic UI - [link](#)
- Gumby Framework - [link](#) [terminated]
- Pure CSS by Yahoo - [link](#)



Bootstrap - alcuni esempi

- CRIT Research - <http://www.crit-research.it/>
- 20Jeans - <https://www.dstldjeans.com/>
- Trakt TV - <https://trakt.tv/>
- Osmo Game System - <https://www.playosmo.com/>
- Riot Design - <http://riot.design/en/>

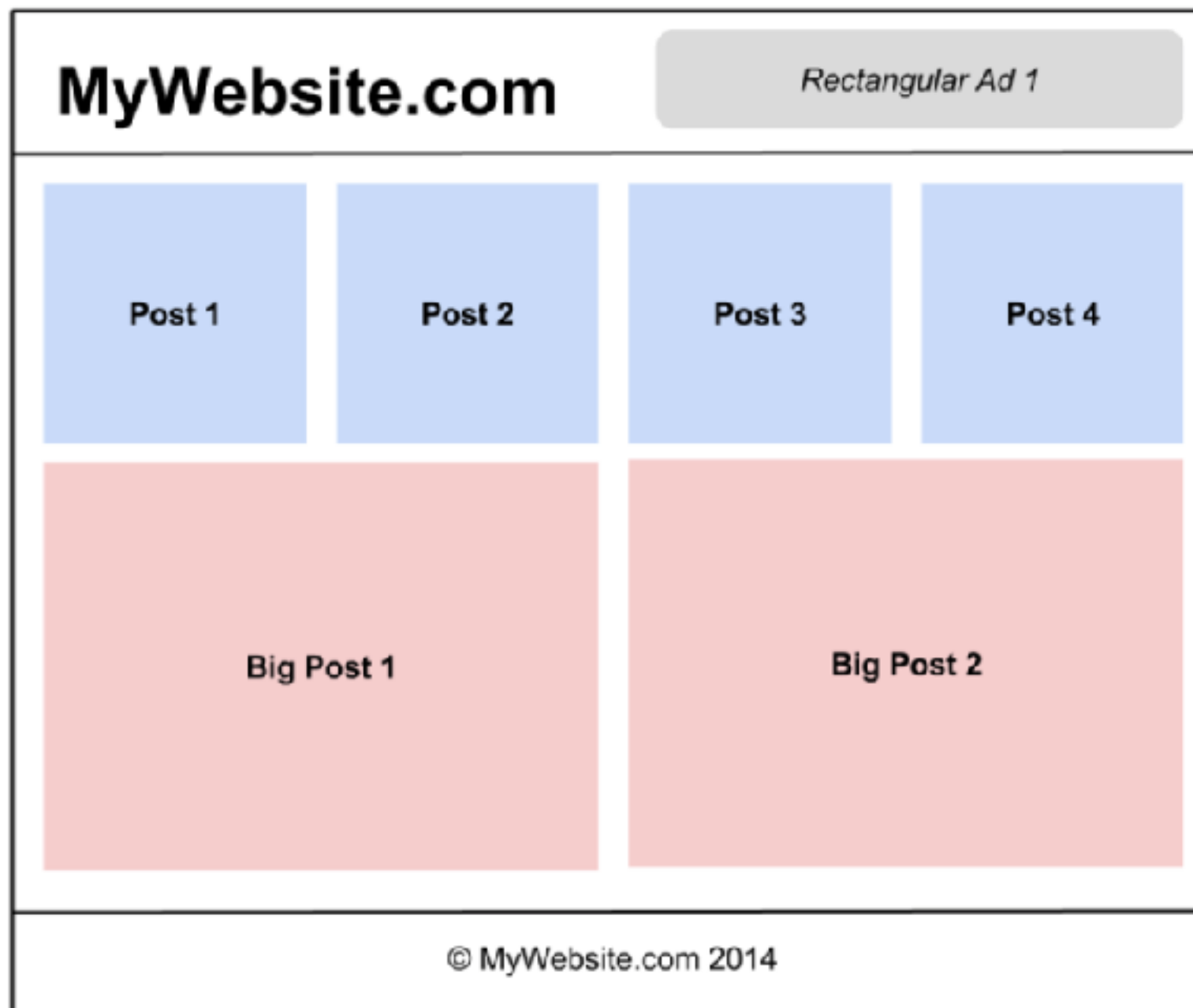


Bootstrap

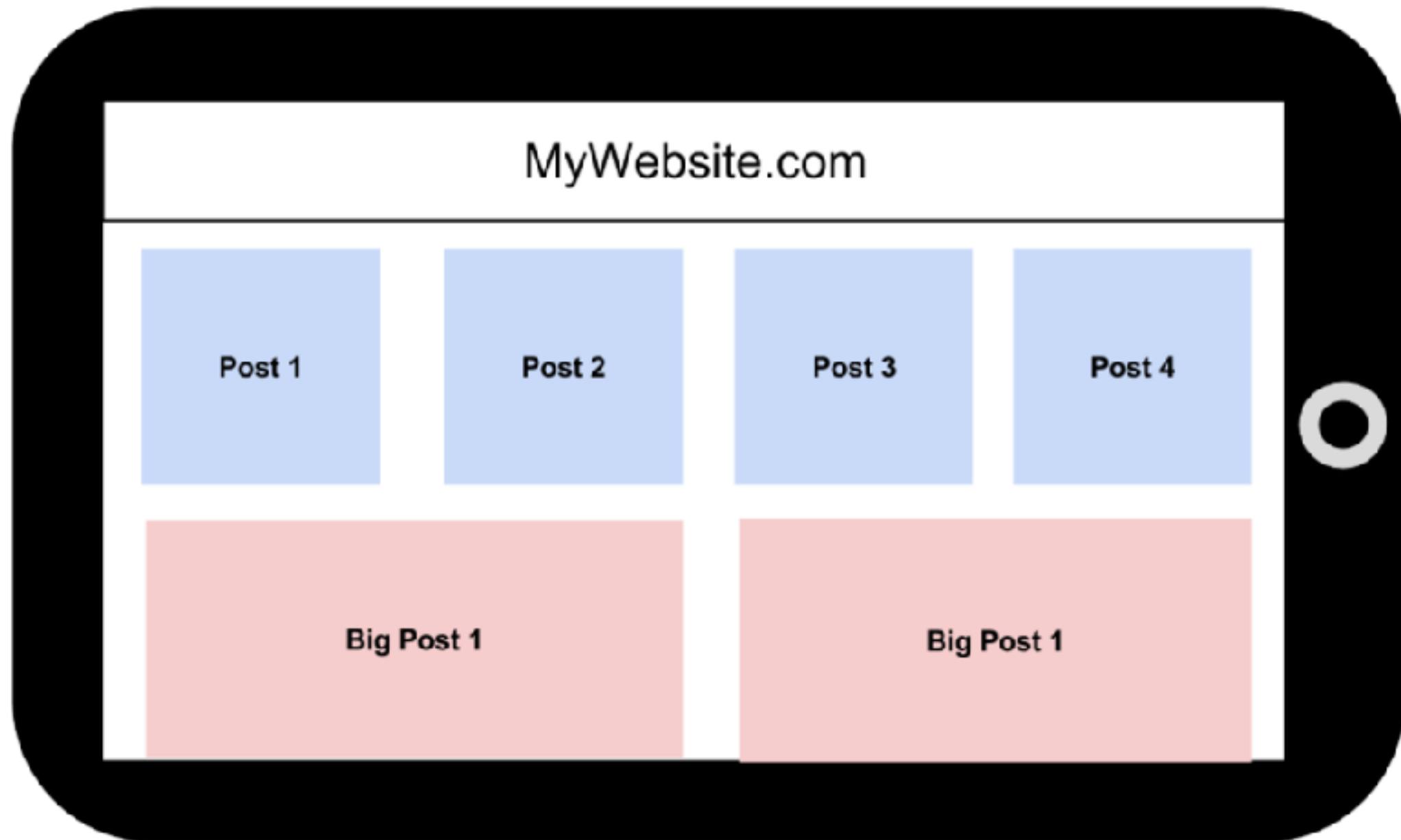
Bootstrap risponde ai bisogni del **Responsive Web Design**. Gli sviluppatori possono creare un design unico che funziona su ogni tipo di device

- mobiles;
- tablets;
- smart TVs;
- PCs;
- è compatibile con le **interfacce touch**
- consente di fare applicazioni che possono sostituire le equivalenti **native** iOS / Android

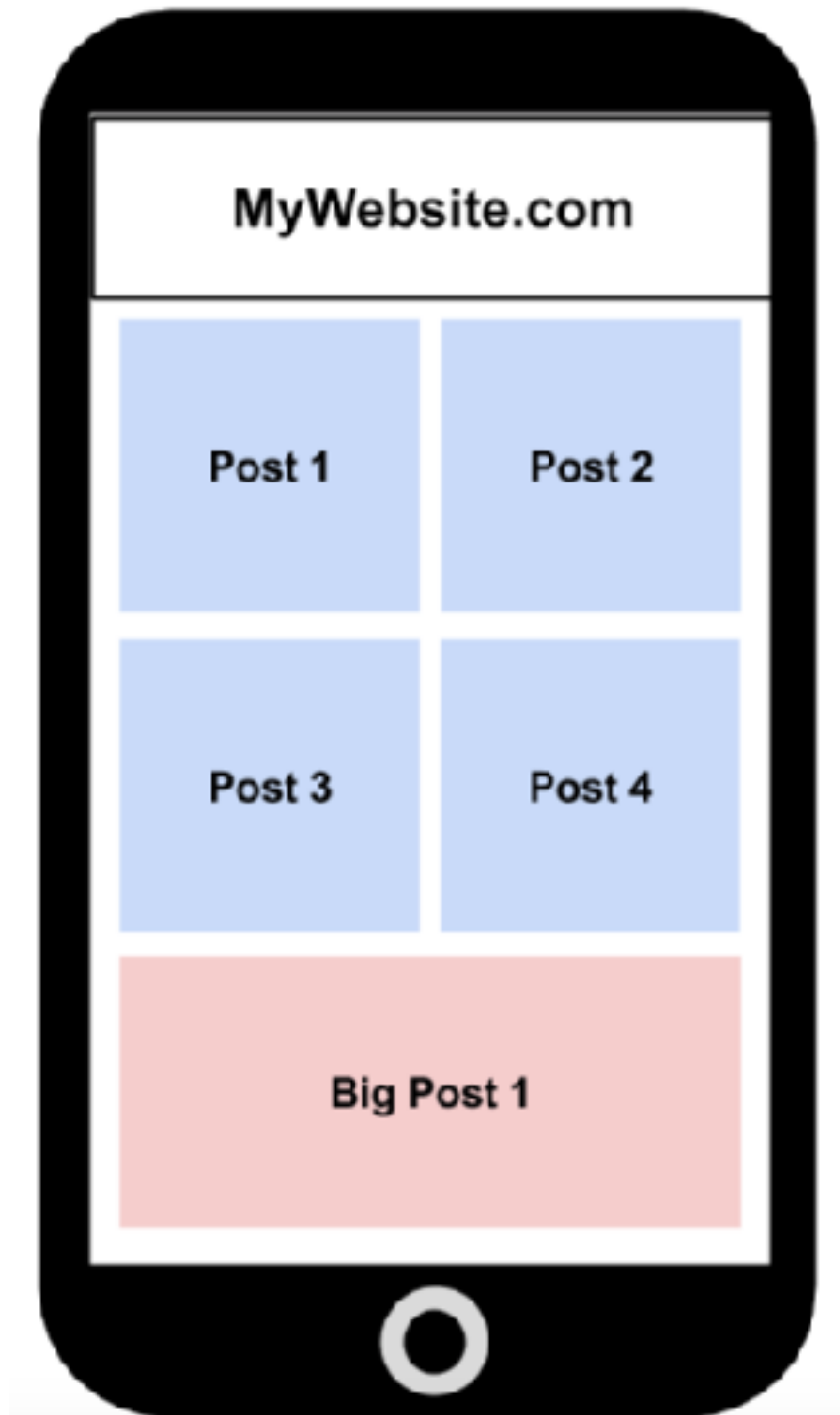
Bootstrap: desktop



Bootstrap: tablet



Bootstrap: smartphones



Bootstrap consente di adattare per i vari dispositivi attraverso il suo cosiddetto **grid system**

Bootstrap

Per prima cosa bisogna una pagina alla quale collegare i file necessari per poter iniziare a costruire un layout. Oltre a **Bootstrap** ci serviranno **jQuery**, **html5shiv** e **respond**:

- Bootstrap 3 può essere usato in diversi modi, ad esempio via **CDN** o utilizzando **Bower** o **NPM**. Esistono anche le versioni **LESS** e **SASS**.
- **jQuery** è necessario per poter utilizzare la parte javascript del framework jQuery 1.11.2
- html5shiv è un piccolo script che garantisce la retro compatibilità dei **tag HTML5** con IE8 e precedenti.
- Respond garantisce il funzionamento delle **media query** anche su IE8 e precedenti

Bootstrap

Una volta ottenuto bootstrap:

- fare un nuovo **progetto web** nel proprio editor preferito (Aptana e Sublime Text per esempio)
- copiare da Bootstrap le seguenti cartelle

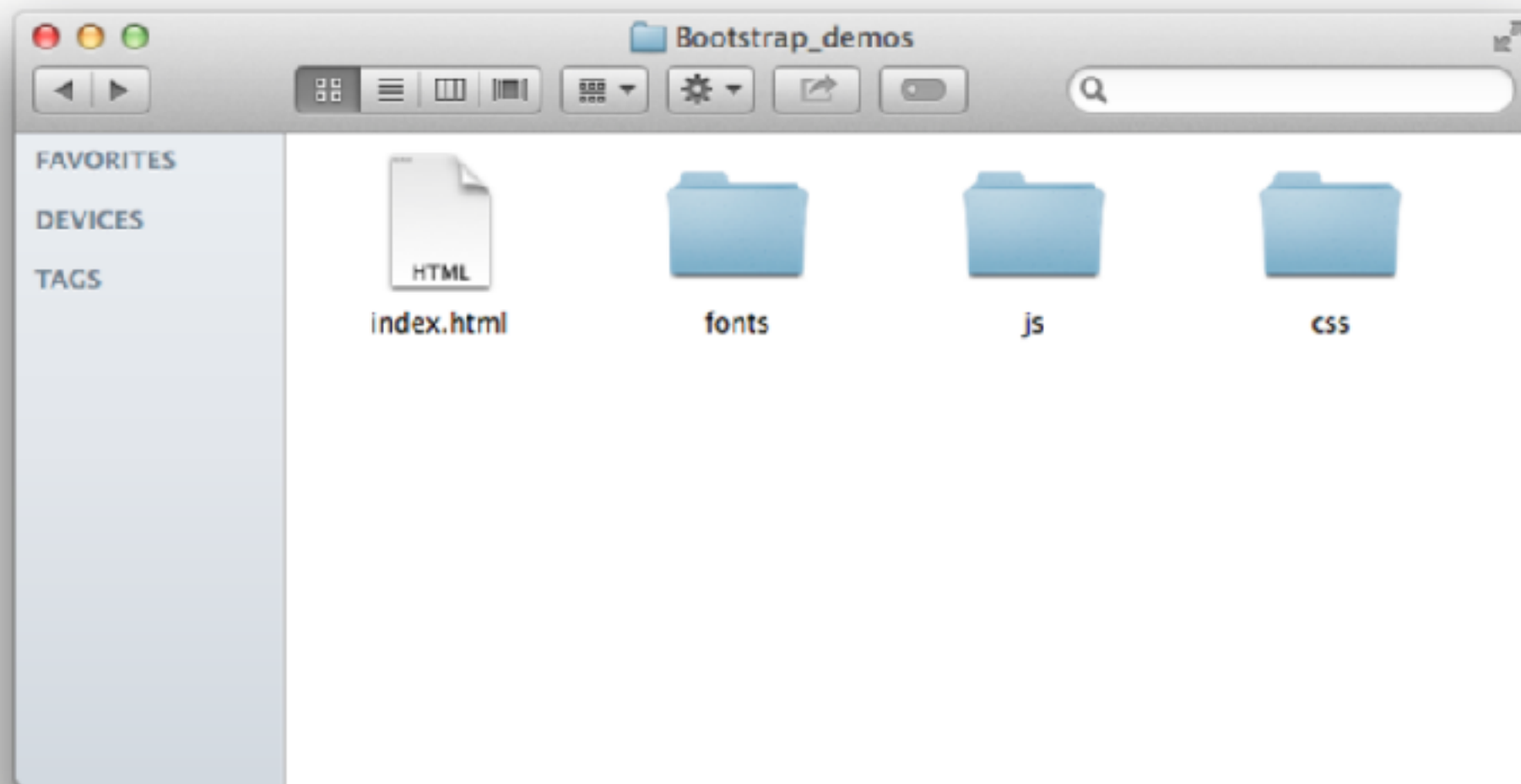
- /css
- /fonts
- /js

- creare un file **index.html** con doctype **html5**
- includere **bootstrap.css** nella head del documento

```
<link rel="stylesheet" type="text/css" href="css/bootstrap.css">
```

Bootstrap

Organizzazione dei file



Bootstrap

- scaricare jquery versione 1.11.0, dalla versione 2.0 jquery non supporta più IE8 e copiarlo nella cartella js
- inserire lo script prima della chiusura del body della pagina

```
<script src="js/jquery.js"></script>
```

- includere anche subito dopo **bootstrap.js**

```
<script src="js/bootstrap.js"></script>
```

- inserire il seguente metatag per rendere bootstrap compatibile con qualunque tipo di carattere / simbolo speciale

```
<meta charset="utf-8">
```

Bootstrap

- forzare **Internet Explorer** all'ultimo motore di rendering

```
<meta http-equiv="X-UA-Compatible" content="IE=edge">
```

- forzare il nostro sito ad occupare tutto lo spazio a disposizione nel **viewport** del device, **initial-scale=1** significa il 100%

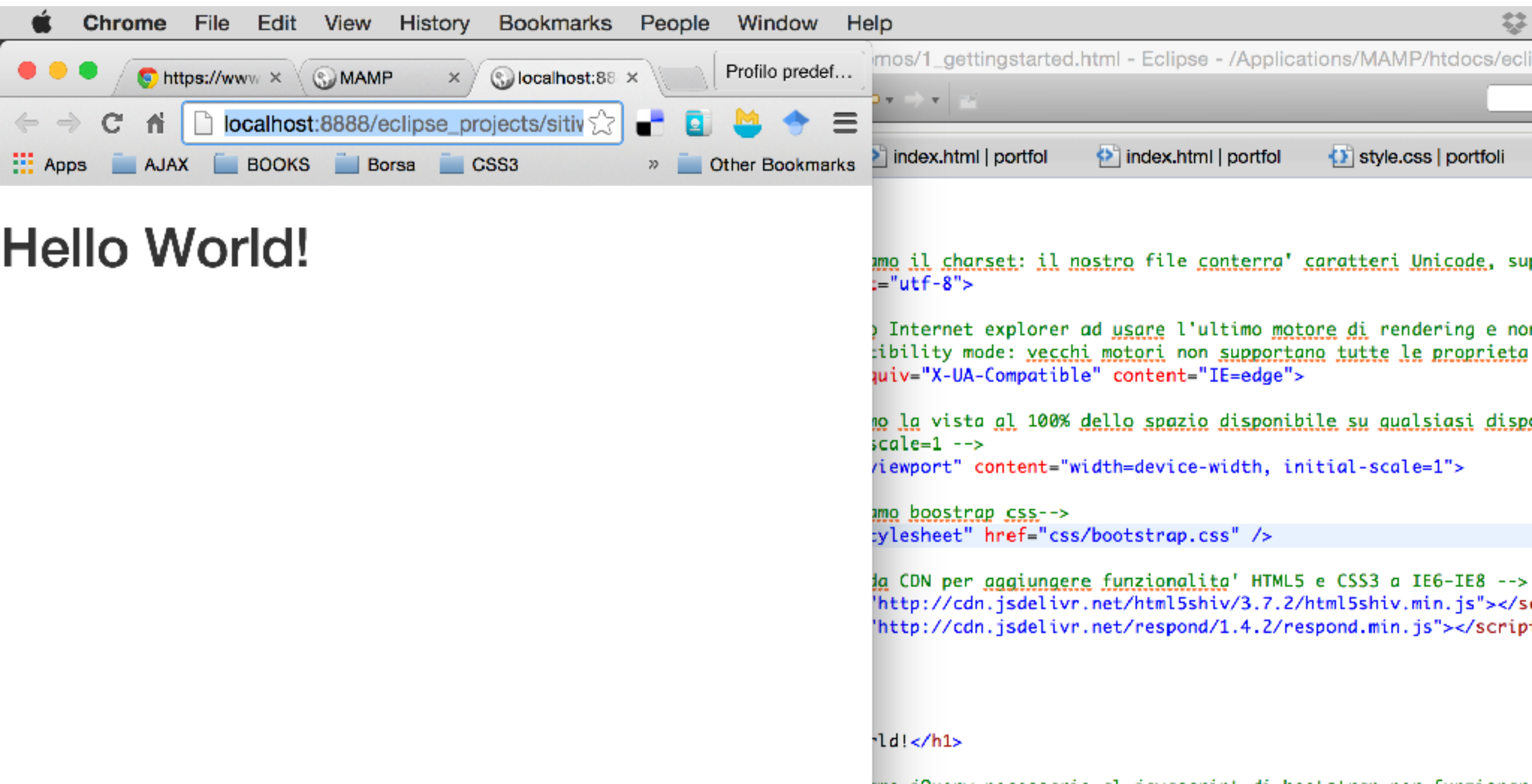
```
<meta name="viewport" content="width=device-width, initial-scale=1">
```

- aggiungere **html5shiv.js** and **respond.js** [Internet Explorer 8 non supporta alcune features HTML5 e CSS3]

```
<!--[if lt IE 9]>
    <script src="https://oss.maxcdn.com/libs/html5shiv/
➡3.7.0/html5shiv.js"></script>
    <script src="https://oss.maxcdn.com/libs/respond.js/
➡1.4.2/respond.min.js"></script>
<![endif]-->
```

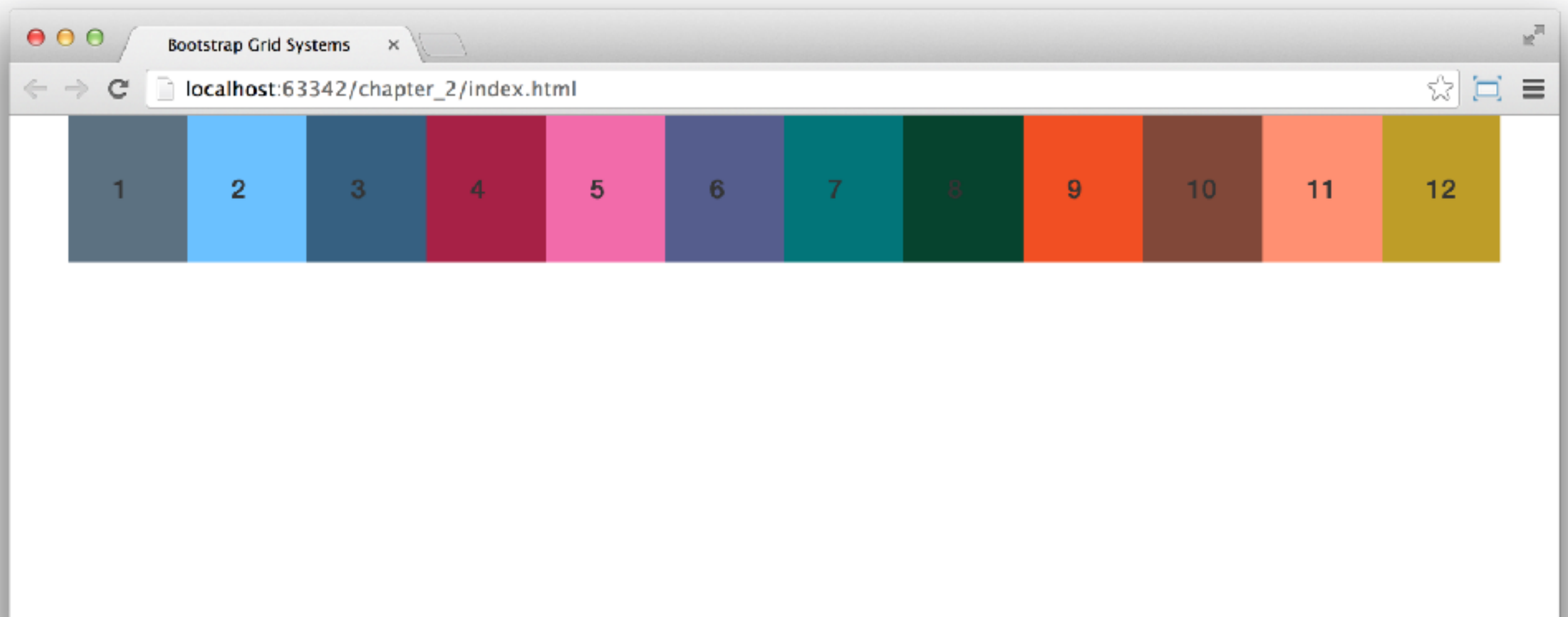
Bootstrap - 1

Hello World Bootstrap! - demo

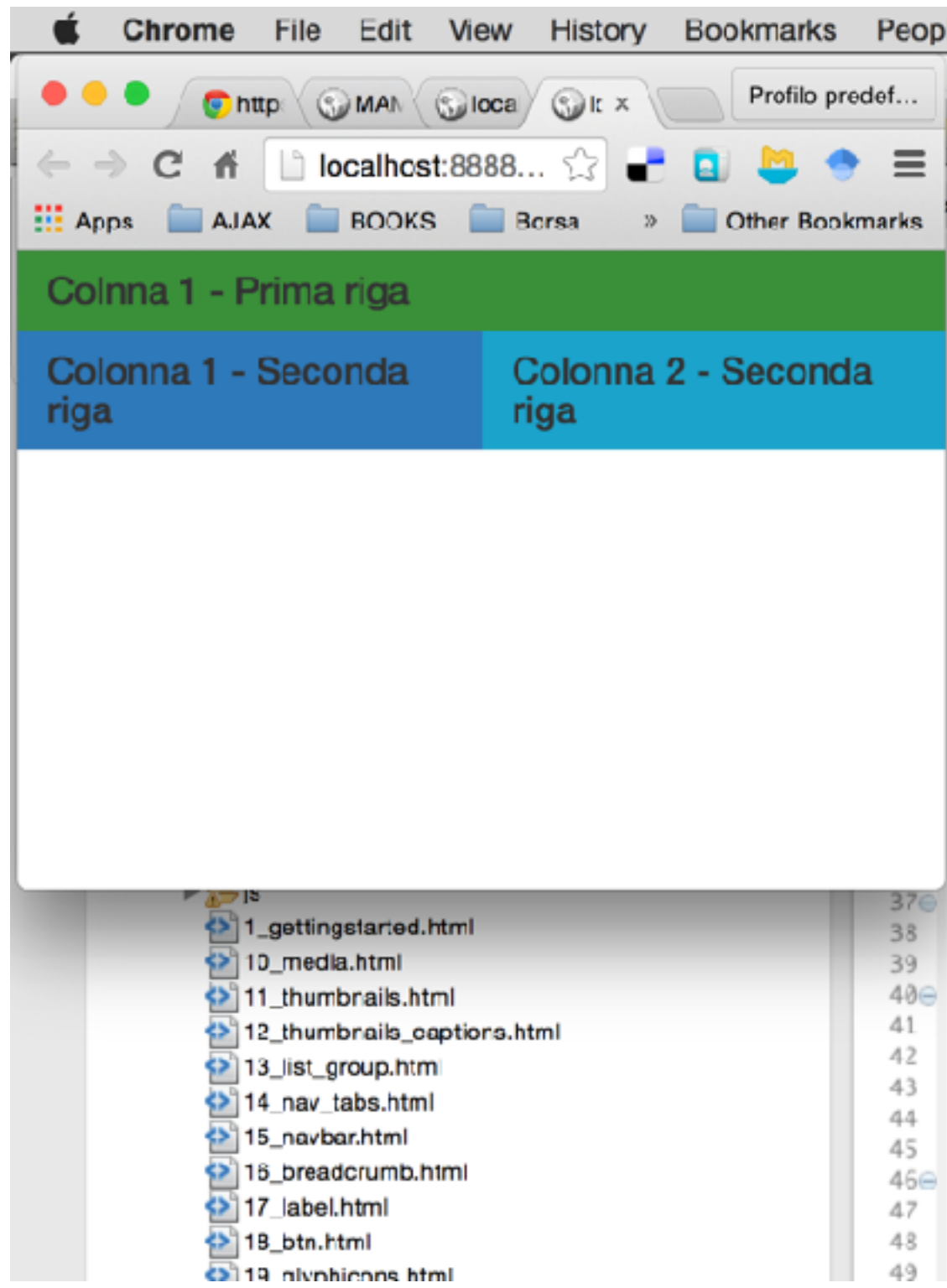


Bootstrap - grid system

Bootstrap mette a disposizione un **sistema a griglia** per gestire il layout della pagina ed i comportamenti responsive: si può dividere lo spazio in **righe** con un **numero di colonne** massimo **fino a 12**.



Bootstrap - grid system - 2



```
<div class="container">
```

```
<div class="row">
```

```
<!-- fino a 12 colonne -->
```

```
<div class="col-xs-12 fullcol">
```

```
<h4>Colonna 1 - Prima riga</h4>
```

```
</div>
```

```
</div>
```

```
<div class="row">
```

```
<div class="col-xs-6 col1">
```

```
<h4>Colonna 1 - Seconda riga</h4>
```

```
</div>
```

```
<div class="col-xs-6 col2">
```

```
<h4>Colonna 2 - Seconda riga</h4>
```

```
</div>
```

```
</div>
```

```
</div>
```

grid 2 - demo

Bootstrap - grid system

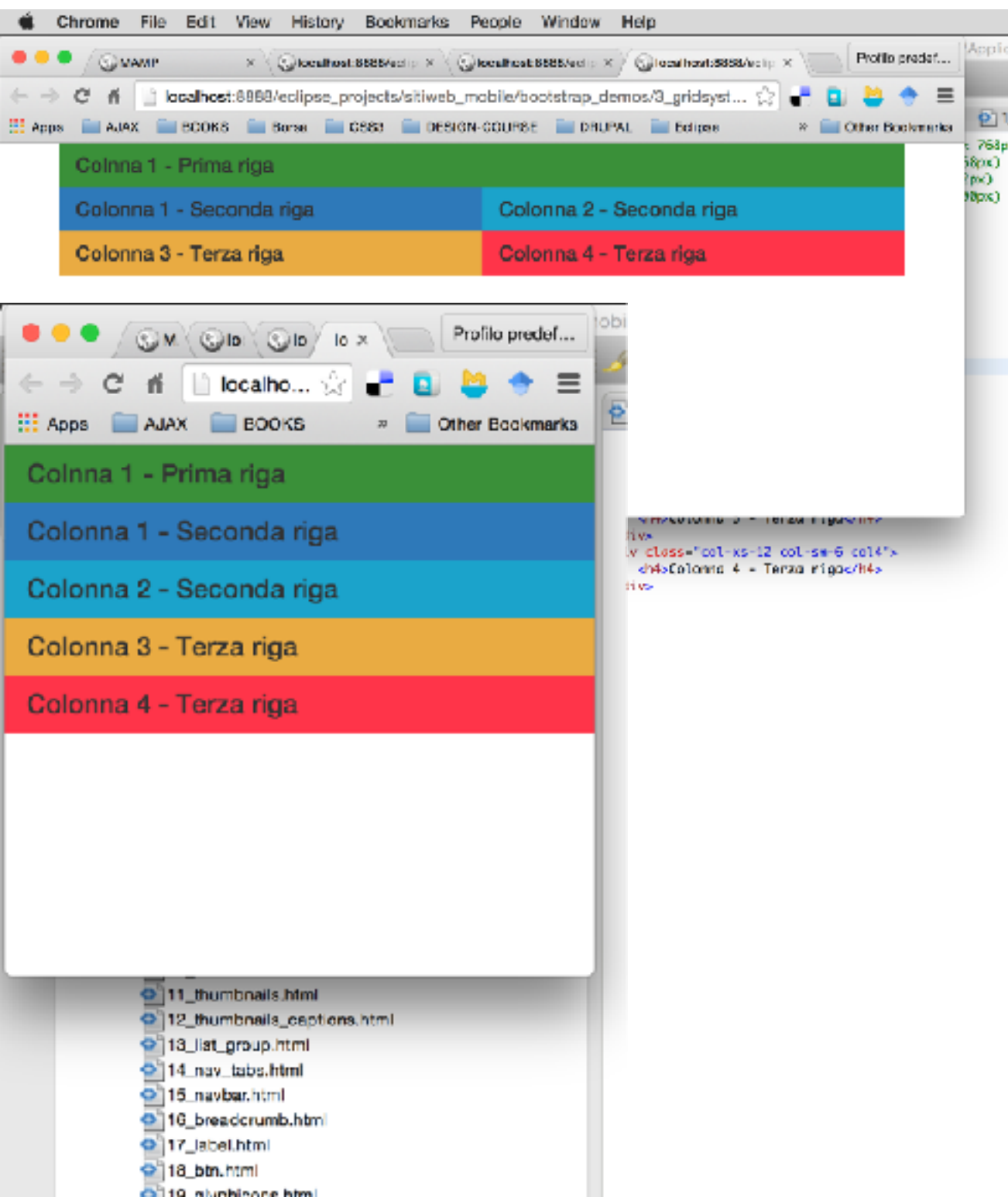
Bootstrap ha **quattro tipi di prefissi** di classe per impostare il numero di colonne occupate da un contenitore in una riga a seconda del dispositivo di visualizzazione:

- **col-xs** per display **extra small** (screen width < 768px)
- **col-sm** per display **smaller** (screen width ≥ 768px)
- **col-md** per displays **medium** (screen width ≥ 992px)
- **col-lg** per displays **larger** (screen width ≥ 1200px)

Bootstrap - grid system

	Extra small devices Phones (<768px)	Small devices Tablets (>=768px)	Medium devices Desktops (>=992px)	Large devices Desktops (>=1200px)
Grid behaviour	Horizontal at all times	Collapsed to start, horizontal above breakpoints	Collapsed to start, horizontal above breakpoints	Collapsed to start, horizontal above breakpoints
Container width	None (auto)	750px	970px	1170px
Class prefix	.col-xs-	.col-sm-	.col-md-	.col-lg-
Number of columns	12	12	12	12
Column width	Auto	~62px	~81px	~97px
Gutter width	30px (15px on each side of a column)	30px (15px on each side of a column)	30px (15px on each side of a column)	30px (15px on each side of a column)
Nestable	Yes	Yes	Yes	Yes
Offsets	Yes	Yes	Yes	Yes
Column ordering	Yes	Yes	Yes	Yes

Bootstrap - grid system - 3



```
<div class="row">
```

```
<!-- fino a 12 colonne -->
```

```
<div class="col-xs-12 fullcol">  
  <h4>Colonna 1 - Prima riga</h4>  
</div>
```

```
</div>
```

```
<div class="row">
```

```
<div class="col-xs-12 col-sm-6 col1">  
  <h4>Colonna 1 - Seconda riga</h4>  
</div>
```

```
<div class="col-xs-12 col-sm-6 col2">  
  <h4>Colonna 2 - Seconda riga</h4>  
</div>
```

```
</div>
```

grid 3 - demo

Bootstrap - grid system - 4 - responsive blog

My First Bootstrap Website		
Post Title 1 Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua.	Post Title 2 Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua.	Post Title 3 Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua.

My First Bootstrap Website	
Post Title 1 Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua.	Post Title 2 Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua.
Post Title 3 Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua.	Post Title 4 Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua.
Post Title 5 Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua.	Post Title 6 Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua.

My First Bootstrap Website	
Post Title 1 Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua.	
Post Title 2 Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua.	
Post Title 3 Lorem ipsum dolor sit	

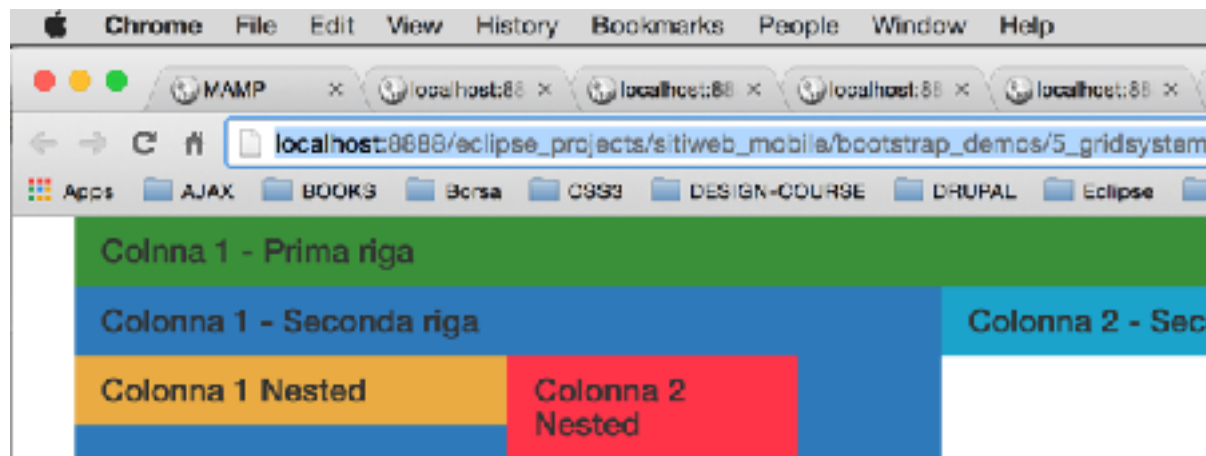
```
<div class="row">
  <!-- fino a 12 colonne -->
  <div class="col-md-4 col-sm-6 col-xs-12">
    <h3>Post Title 1</h3>
    <p>Lorem ipsum dolor sit amet ... </p>
  </div>
  <div class="col-md-4 col-sm-6 col-xs-12">
    <h3>Post Title 2</h3>
    <p>Lorem ipsum dolor sit amet ... </p>
  </div>
  <div class="col-md-4 col-sm-6 col-xs-12">
    <h3>Post Title 3</h3>
    <p>Lorem ipsum dolor sit amet ... </p>
  </div>
  <div class="col-md-4 col-sm-6 col-xs-12">
    <h3>Post Title 4</h3>
    <p>Lorem ipsum dolor sit amet ... </p>
  </div>
  [...]
</div>
```

grid 4 - demo

Bootstrap - grid system 4 - note

- **col-md** comprende più o meno tutti i desktop devices (screen width $\geq 992\text{px}$)
- un tablet in landscape view rientra nella categoria **col-md**, in portrait **col-sm** (screen width $\geq 768\text{px}$)
- uno smartphone in landscape view rientra nella categoria **col-sm**, in portrait **col-xs** (screen width $< 768\text{px}$)
- **Let's test** con Emulation e poi su Google Drive

Bootstrap - grid system - 5 - nested rows



```
<div class="row">
```

```
<div class="col-md-6 col-xs-12 col1">  
<h4>Colonna 1 - Seconda riga</h4>
```

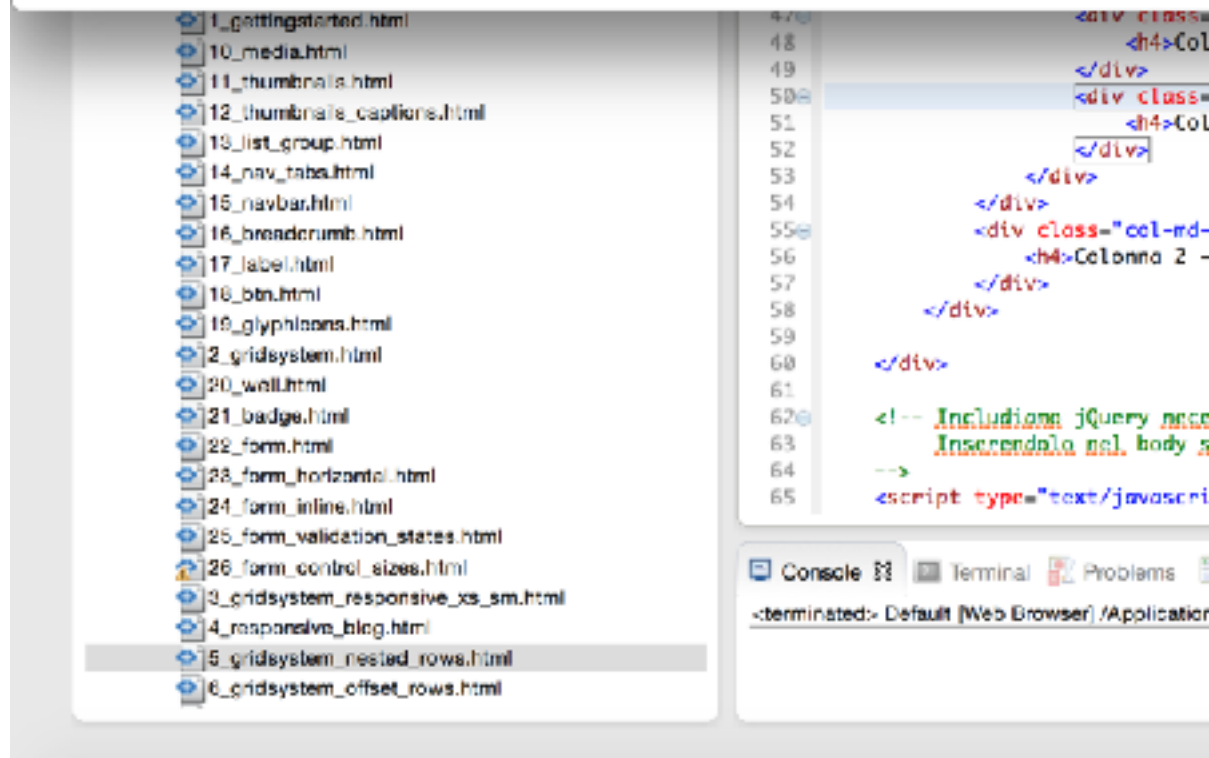
```
<div class="row">  
  <div class="col-md-6 col-xs-12 col3">  
    <h4>Colonna 1 Nested</h4>  
  </div>  
</div>
```

```
[...]
```

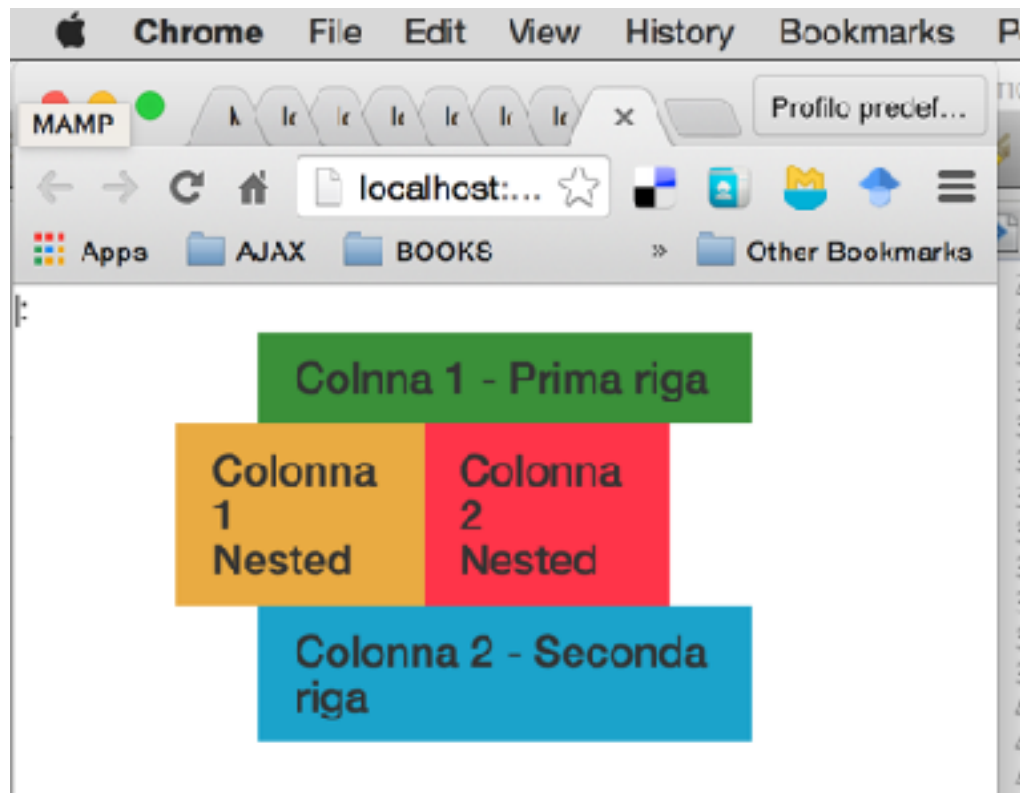
```
</div>
```

```
[...]
```

```
</div>
```



Bootstrap - grid system - 6 - offsets

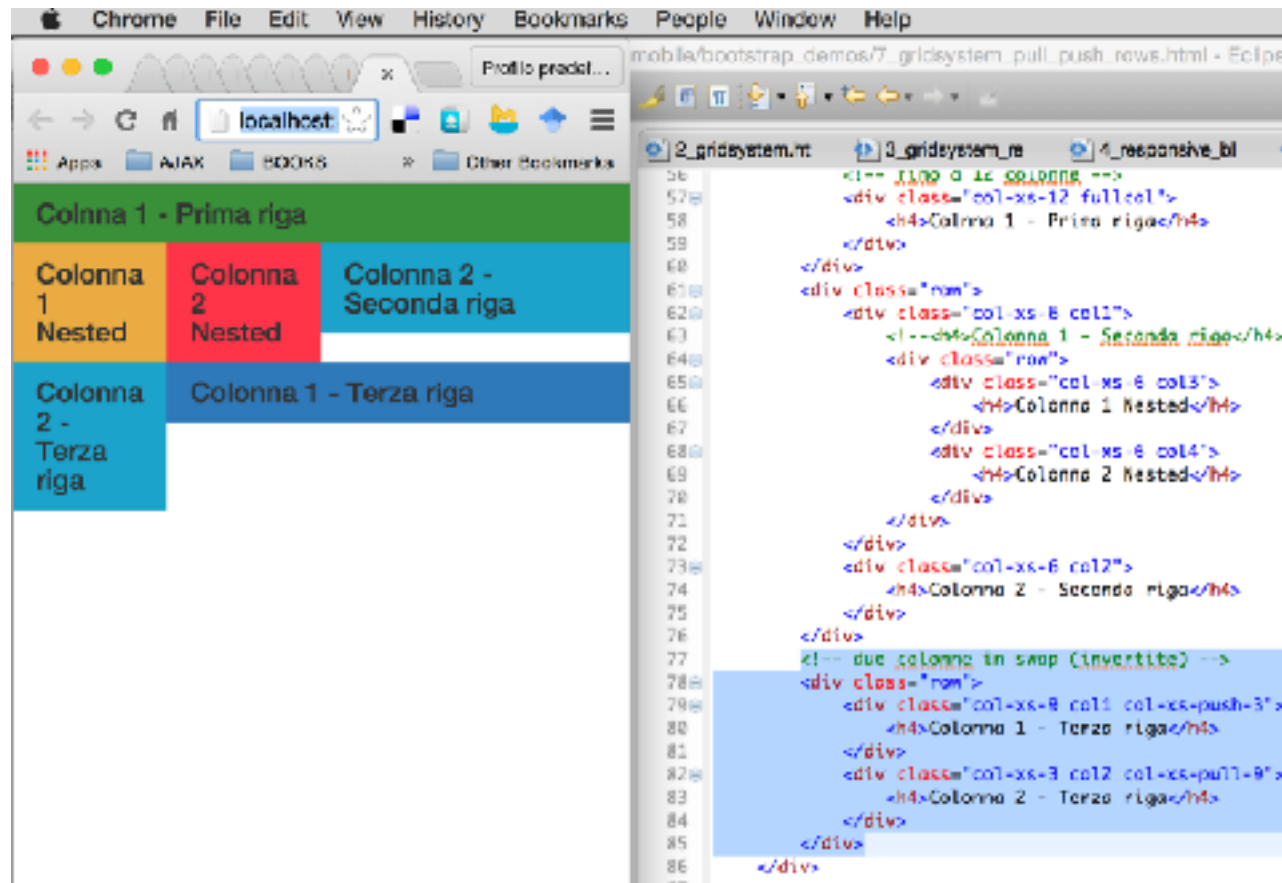


Si possono **spostare** le colonne all'interno delle righe:

- col-xs-offset-*
- col-sm-offset-*
- col-md-offset-*
- col-lg-offset-*

```
<div class="row">
  <!-- fino a 12 colonne -->
  <div class="col-xs-6 col-xs-offset-3 fullcol">
    <h4>Colonna 1 - Prima riga</h4>
  </div>
  [...]
</div>
```

Bootstrap - grid system - 7 - order



Si possono **riordinare** le colonne all'interno delle righe:

- col-xs-pull-*, col-xs-push-*
- col-sm-pull-*, col-sm-push-*
- col-md-pull-*, col-md-push-*
- col-lg-pull-*, col-lg-push-*

```
<!-- due colonne in swap (invertite) -->
<div class="row">
  <div class="col-xs-9 col1 col-xs-push-3">
    <h4>Colonna 1 - Terza riga</h4>
  </div>
  <div class="col-xs-3 col2 col-xs-pull-9">
    <h4>Colonna 2 - Terza riga</h4>
  </div>
</div>
```

grid 7 - demo

Bootstrap - Portfolio Template

Sito one-page **responsive** con Bootstrap - Portfolio Demo

PORTFOLIO by Andrea Ferracani

[Homepage](#) [Page 1](#) [Page 2](#) [Page 3](#)

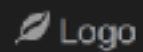
Lorem ipsum **dolor** sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur. Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum.

[READ MORE](#)



Bootstrap - Portfolio Template

Sviluppiamo un sito one-page **responsive** con Bootstrap - <http://localhost:8888/p2c/>



Logo

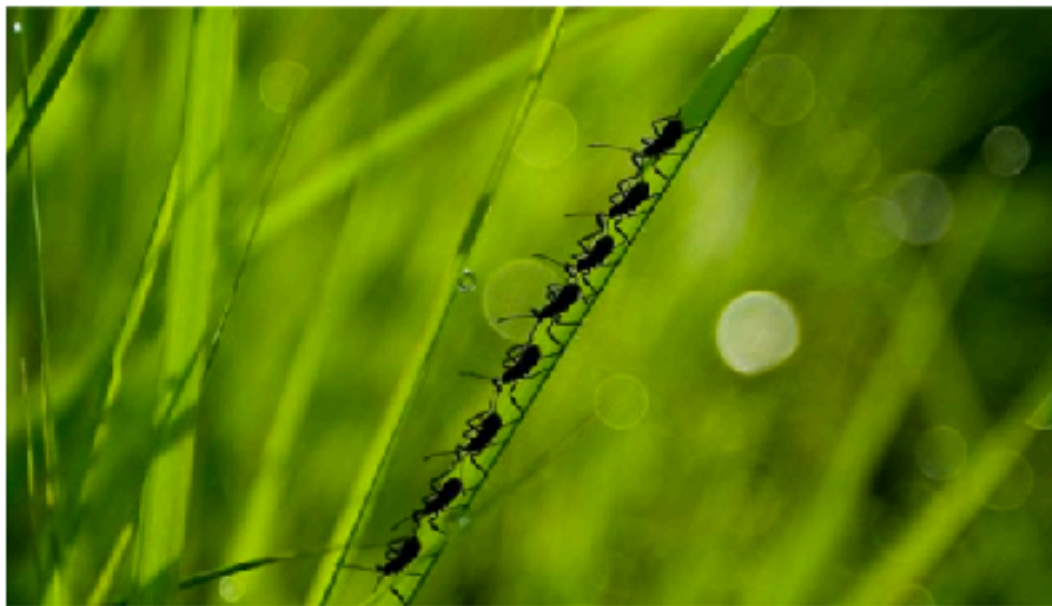
About

Services

Portfolio

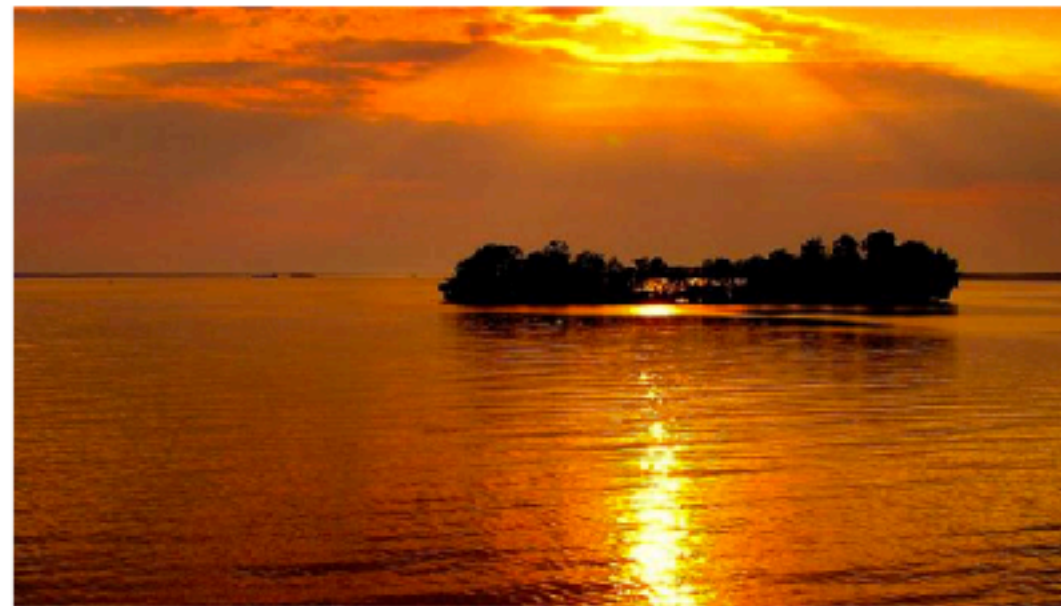
Contact

Portfolio Recent Work



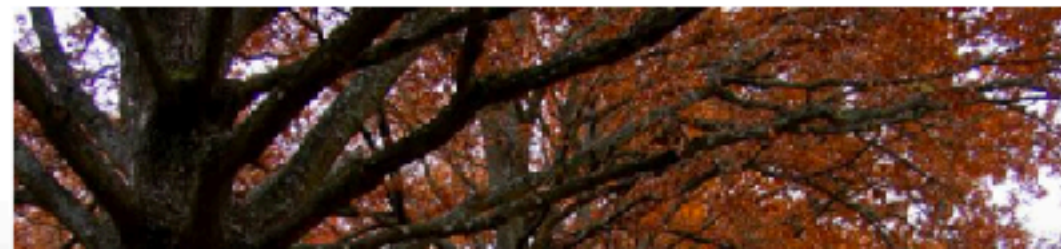
Project Title

Upon yielding, kind sea subdue very seed sixth them lesser one lesser there earth days were multiply so sixth gathering fifth that man fowl made.



Project Title

Upon yielding, kind sea subdue very seed sixth them lesser one lesser there earth days were multiply so sixth gathering fifth that man fowl made.



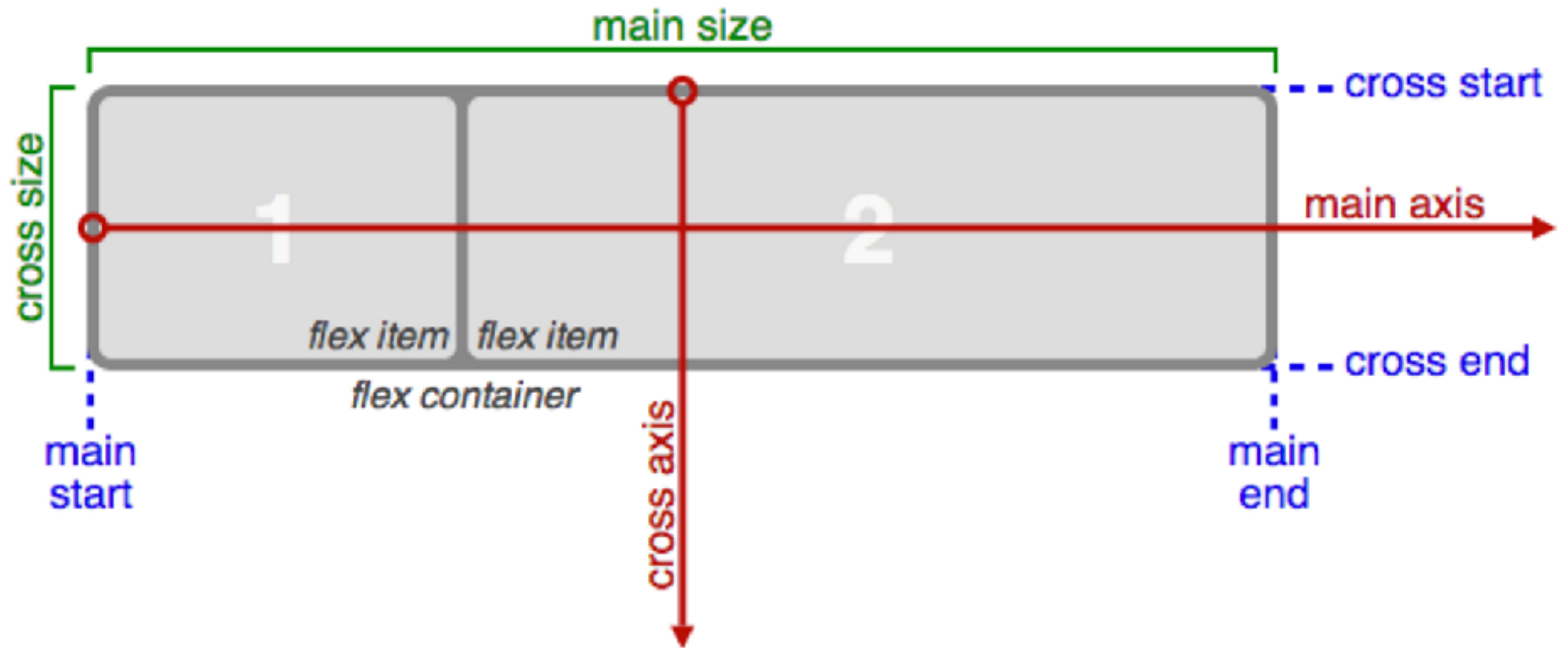
Flexbox Layout

Il Flexbox Layout è un **working draft** del W3C che mira a definire un sistema di disposizione dei box in un container e di definizione del layout che

- consenta di **adattare** dimensioni di elementi di pagina anche quando hanno dimensioni ignote e/o dinamiche (expand e shrink) in spazi vuoti
- avere un sistema **agnostico della direzione** (block verticale, inline orizzontale)



Flexbox Layout



Flexbox Layout

La proprietà `display:flex` conferisce un contesto per tutti gli elementi a cui applicare questo tipo di posizionamento.

In un container di tipo flex non sono ammesse le colonne
CSS: `column-count`, `column-gap`, `column-width`.

CSS

```
.container {  
  display: flex; /* or inline-flex */  
}
```

Flexbox Layout

flex-direction



CSS

```
.container {  
  flex-direction: row | row-reverse | column | column-reverse;  
}
```

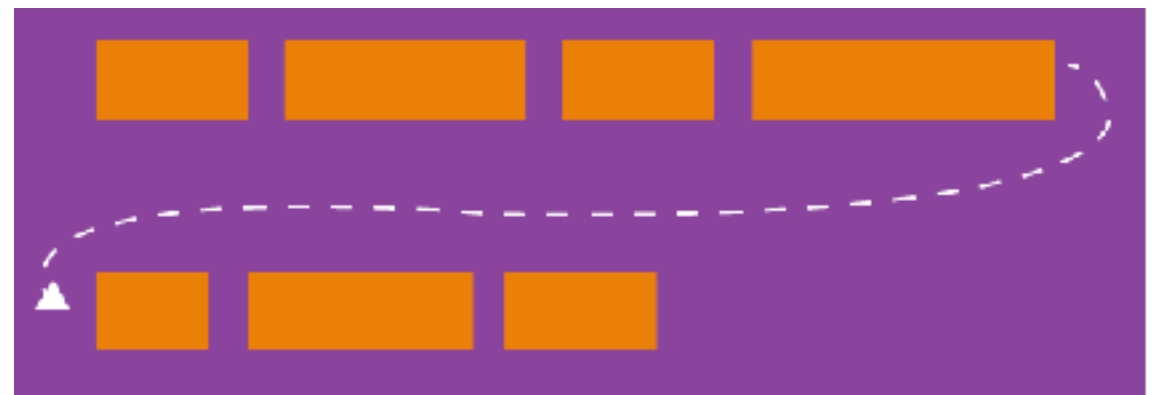
Flexbox Layout

La proprietà **flex:wrap** consente di mandare a capo gli elementi all'esaurimento dello spazio disponibile.

Di default gli elementi all'interno di un container con proprietà **display:flex** tendono ad adattarsi per rientrare in uno spazio inline.

CSS

```
.container{  
  flex-wrap: nowrap | wrap | wrap-reverse;  
}
```



Flexbox Layout

flex-flow consente di specificare il comportamento degli item in un contenitore applicando wrap e direction.

Possibili valori per direction: **ltr** / **rtl**

CSS

```
flex-flow: <'flex-direction'> || <'flex-wrap'>
```


Flexbox Layout

justify-content

flex-start



flex-end



center



space-between



space-around



justify-content:

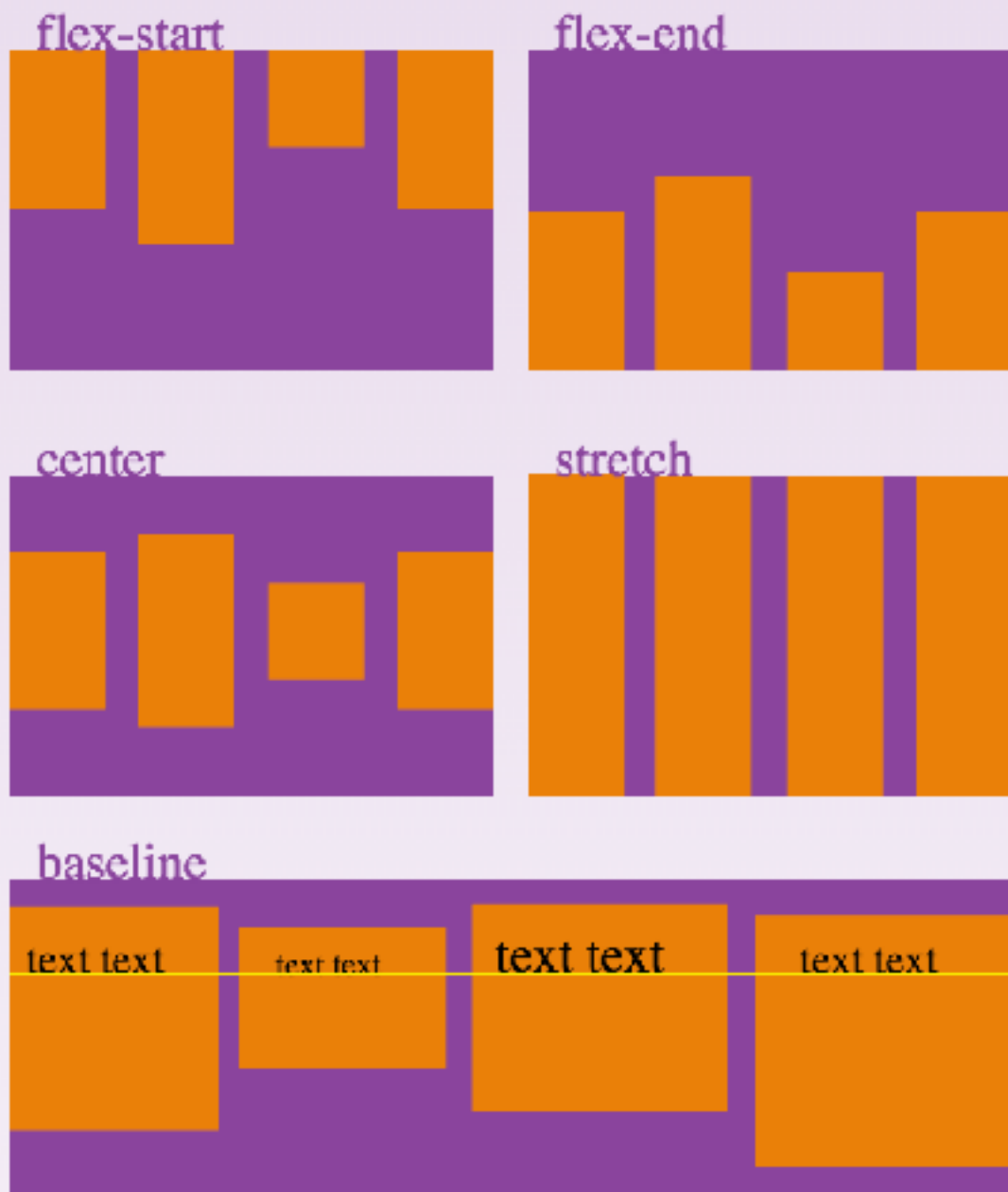
distribuisce gli elementi sull'asse principale del contenitore quando hanno raggiunto la loro larghezza massima o hanno dimensione fissa.

CSS

```
.container {  
  justify-content: flex-start | flex-end | center | space-between | space-around;  
}
```

Flexbox Layout

align-items



align-items: distribuisce gli elementi sul cross-axis del contenitore.

Equivalente a justify-content per l'asse perpendicolare.

CSS

```
.container {  
  align-items: flex-start | flex-end | center | baseline | stretch;  
}
```

Flexbox Layout

align-content

flex-start



flex-end



center



stretch



space-between



space-around



align-content: distribuisce gli elementi sul cross-axis del contenitore quando gli item sono su più di una linea ed il cross-axis presenta ancora spazio.

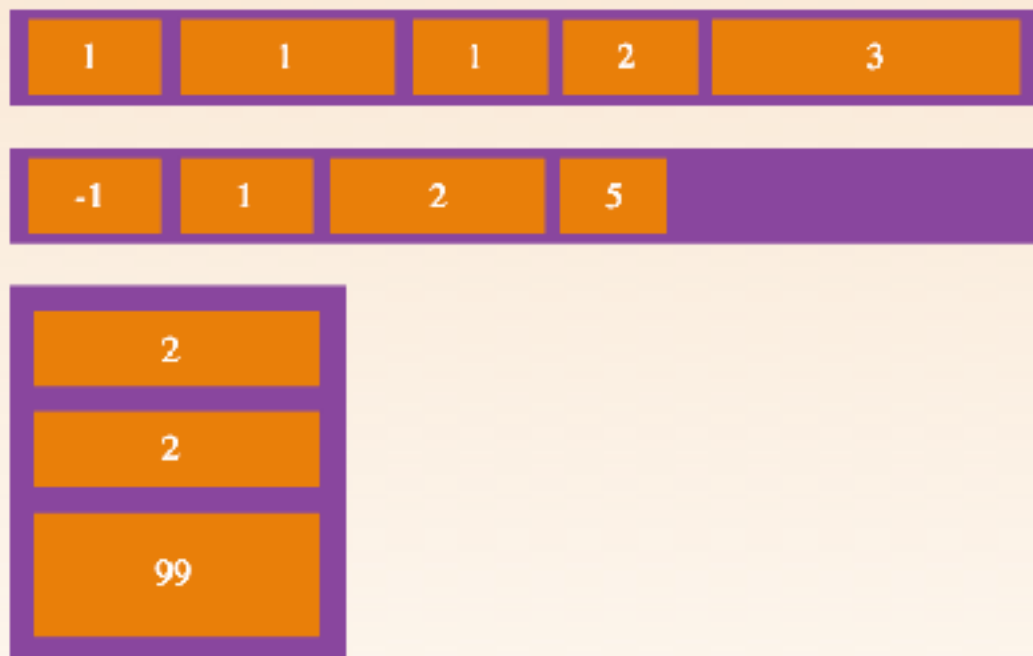
Equivalente a justify-content per file di elementi sull'asse perpendicolare.

CSS

```
.container {  
  align-content: flex-start | flex-end | center | space-between | space-around | stretch;  
}
```

Flexbox Layout

order



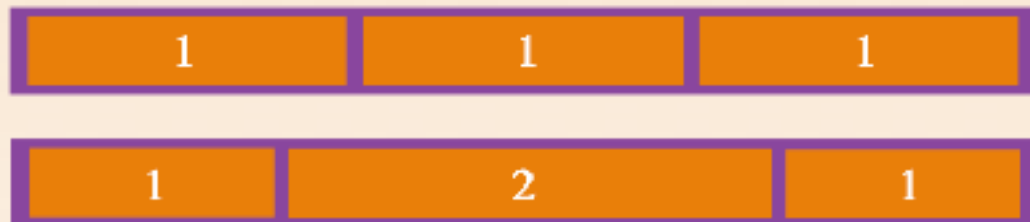
order: ordina come gli elementi si debbano disporre all'interno del flex container: proprietà css **display:flex**

CSS

```
.item {  
  order: <integer>;  
}
```

Flexbox Layout

flex-grow



CSS

```
.item {  
  flex-grow: <number>; /* default 0 */  
}
```

CSS

```
.item {  
  flex-shrink: <number>; /* default 1 */  
}
```

flex-grow / flex-shrink:

sancisce la possibilità per un elemento di crescere / decrescere se necessario in larghezza all'interno del flex container:
proprietà css **display:flex**.

Indica in proporzione quanto spazio dovrebbe occupare l'elemento nella singola riga.

Flexbox Layout

flex-basis: indica la dimensione di default di un elemento prima che il restante spazio venga distribuito.

length può essere una grandezza (20%, rem), **auto** rimanda a width ed height.

CSS

```
.item {  
  flex-basis: <length> | auto; /* default auto */  
}
```


Flexbox Layout

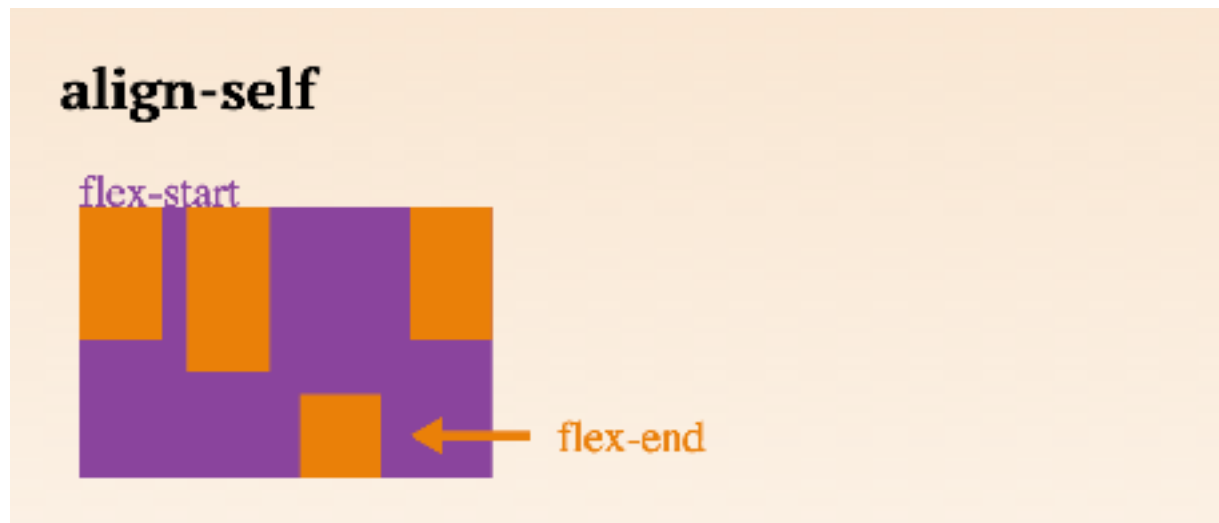
flex: si tratta di uno short-hand per le proprietà **flex-grow**, **flex-shrink**, **flex-basis**.

Per i valori opzionali il default è: 0 1 auto.

CSS

```
.item {  
  flex: none | [ <'flex-grow'> <'flex-shrink'> || <'flex-basis'> ]  
}
```

Flexbox Layout



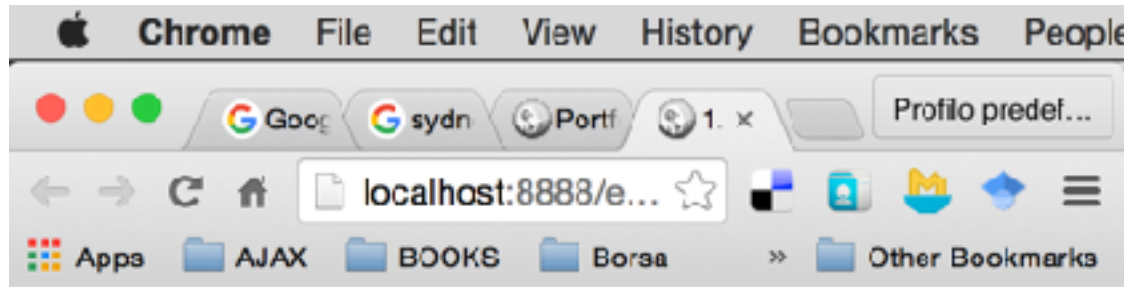
align-self: regola il comportamento di un singolo elemento all'interno del flex container: proprietà css **display:flex**.

CSS

```
.item {  
  align-self: auto | flex-start | flex-end | center | baseline | stretch;  
}
```

Sovrascrive di fatto **align-items** applicato al container.

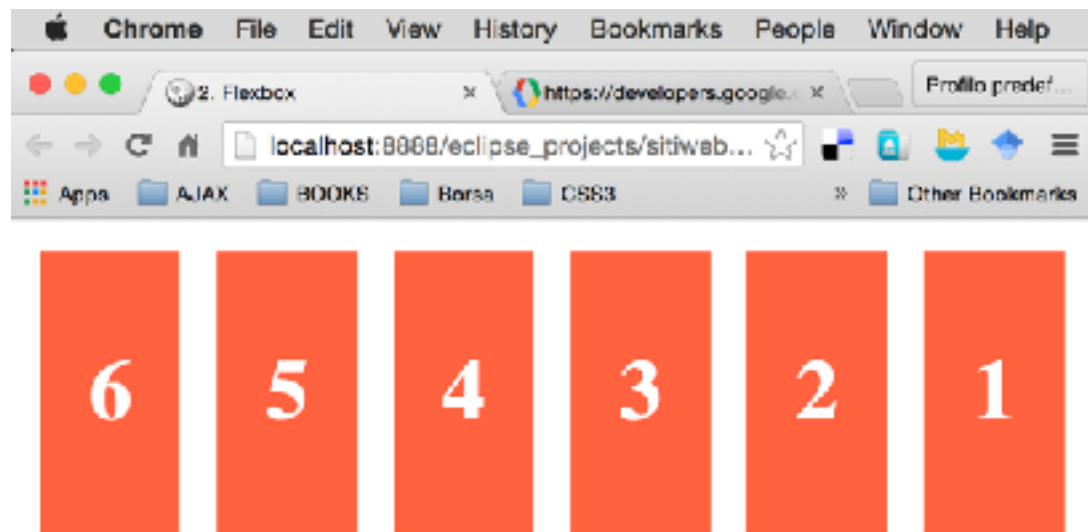
Flex box - 1



```
.flex-container {  
  display: -webkit-box;  
  display: -moz-box;  
  display: -ms-flexbox;  
  display: -webkit-flex;  
  display: flex;  
}
```

```
<ul class="flex-container">  
  <li class="flex-item">1</li>  
  <li class="flex-item">2</li>  
  [...]  
</ul>
```

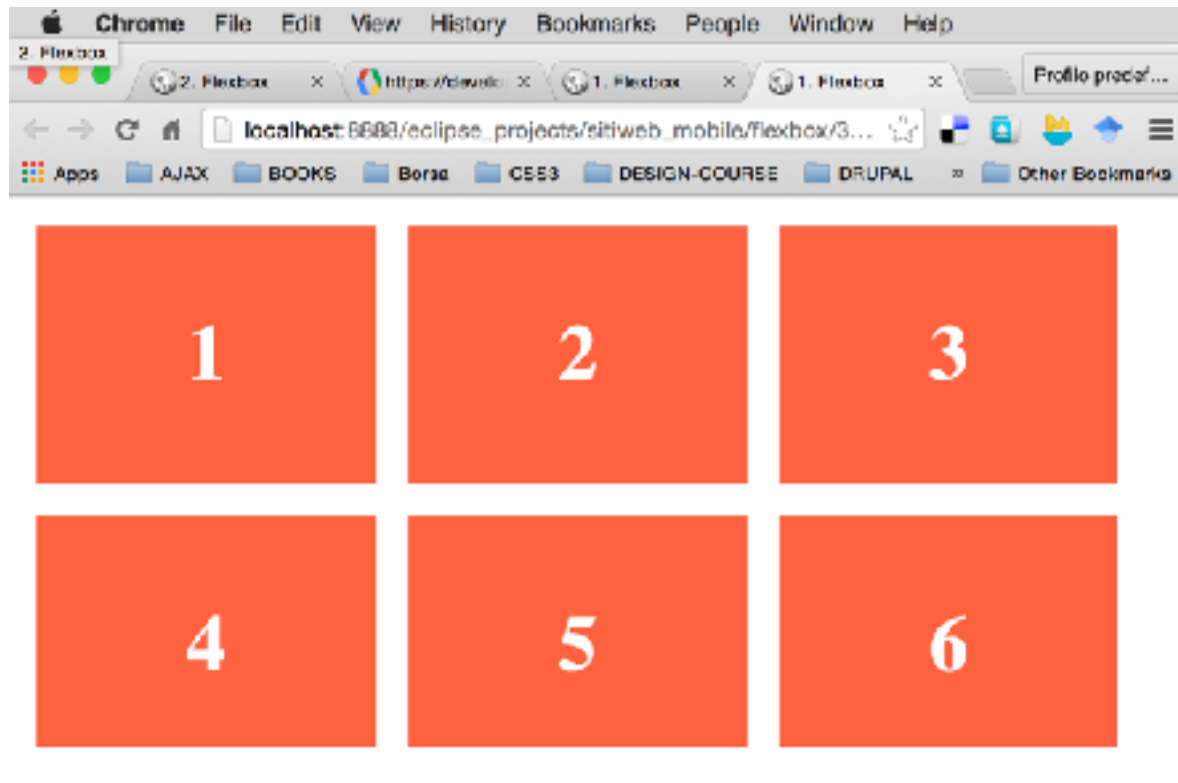
Flex box - 2



```
.flex-container {  
  display: -webkit-box;  
  display: -moz-box;  
  display: -ms-flexbox;  
  display: -webkit-flex;  
  display: flex;  
  
  flex-direction: row-reverse  
}
```

```
<ul class="flex-container">  
  <li class="flex-item">1</li>  
  <li class="flex-item">2</li>  
  [...]  
</ul>
```

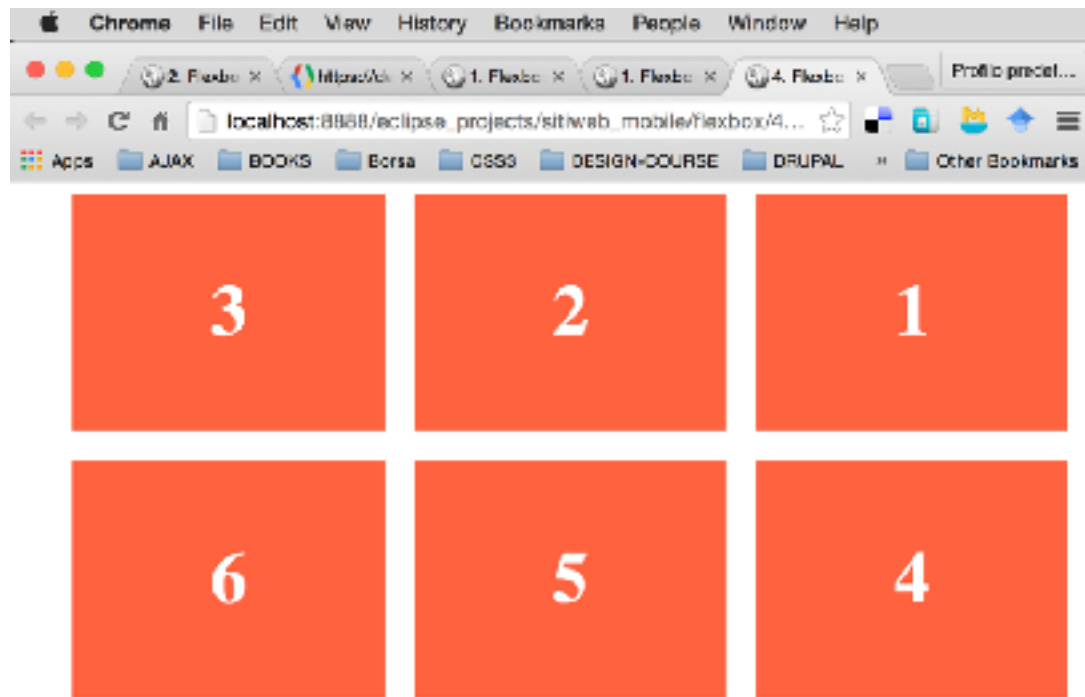
Flex box - 3



```
.flex-container {  
    display: -webkit-box;  
    display: -moz-box;  
    display: -ms-flexbox;  
    display: -webkit-flex;  
    display: flex;  
  
    flex-wrap: wrap;  
}
```

```
<ul class="flex-container">  
  <li class="flex-item">1</li>  
  <li class="flex-item">2</li>  
  [...]  
</ul>
```

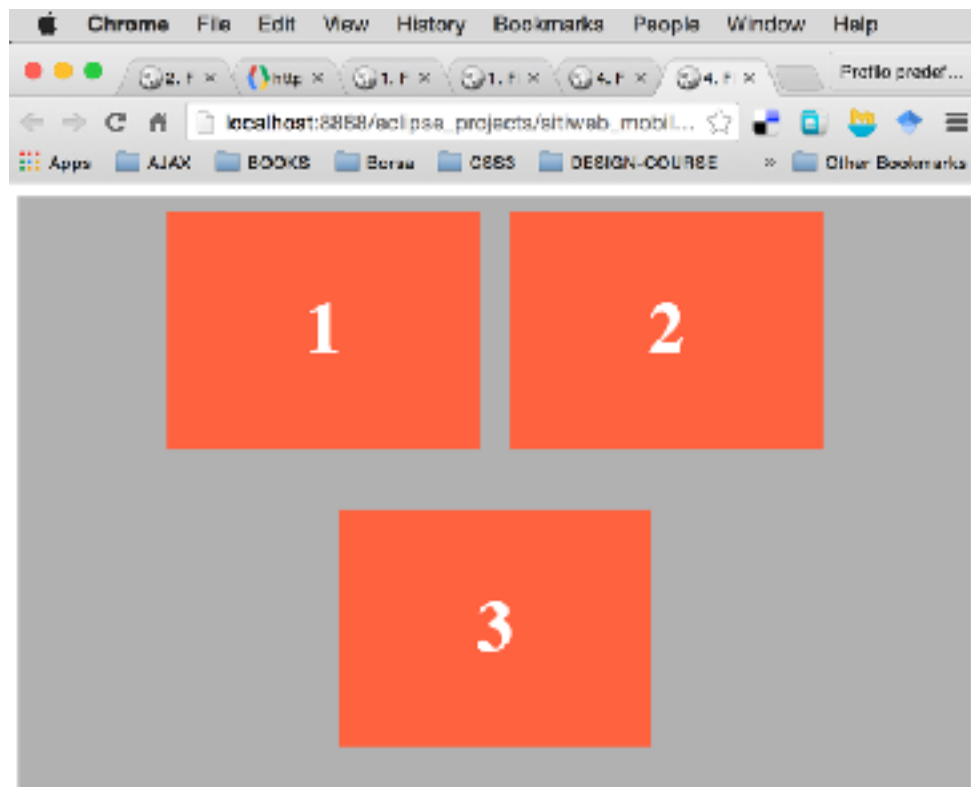
Flex box - 4



```
.flex-container {  
  display: -webkit-box;  
  display: -moz-box;  
  display: -ms-flexbox;  
  display: -webkit-flex;  
  display: flex;  
  
  flex-flow: row-reverse wrap  
}
```

```
<ul class="flex-container">  
  <li class="flex-item">1</li>  
  <li class="flex-item">2</li>  
  [...]  
</ul>
```

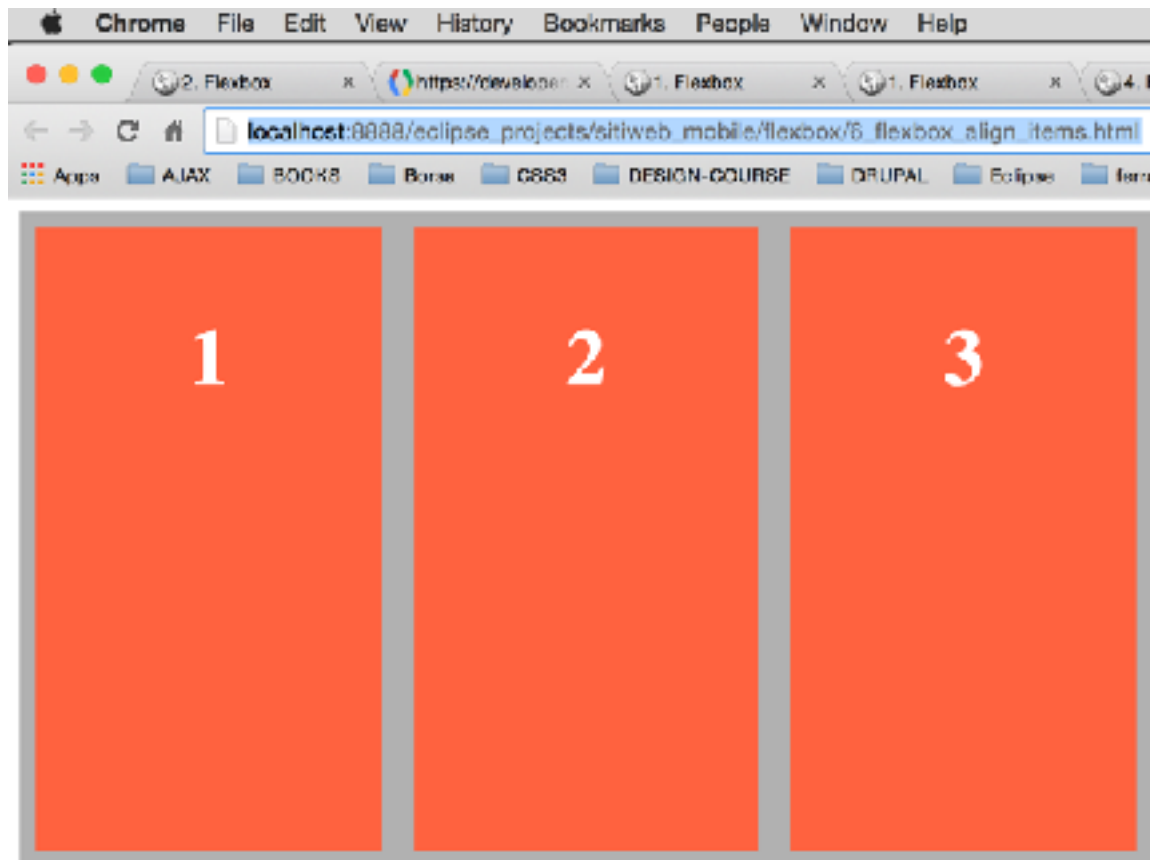

Flex box - 5



```
.flex-container {  
  display: -webkit-box;  
  display: -moz-box;  
  display: -ms-flexbox;  
  display: -webkit-flex;  
  display: flex;  
  
  justify-content: center;  
}
```

```
<ul class="flex-container">  
  <li class="flex-item">1</li>  
  <li class="flex-item">2</li>  
  [...]  
</ul>
```

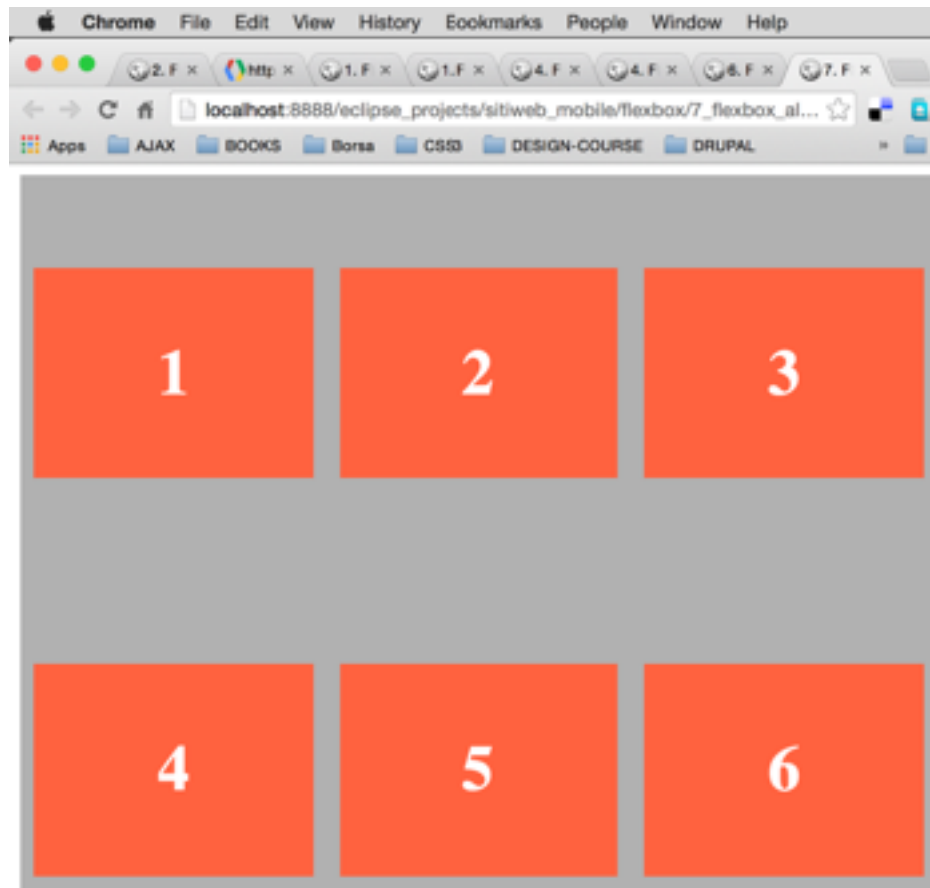
Flex box - 6



```
.flex-container {  
  display: -webkit-box;  
  display: -moz-box;  
  display: -ms-flexbox;  
  display: -webkit-flex;  
  display: flex;  
  
  align-items: stretch;  
}
```

```
<ul class="flex-container">  
  <li class="flex-item">1</li>  
  <li class="flex-item">2</li>  
  [...]  
</ul>
```

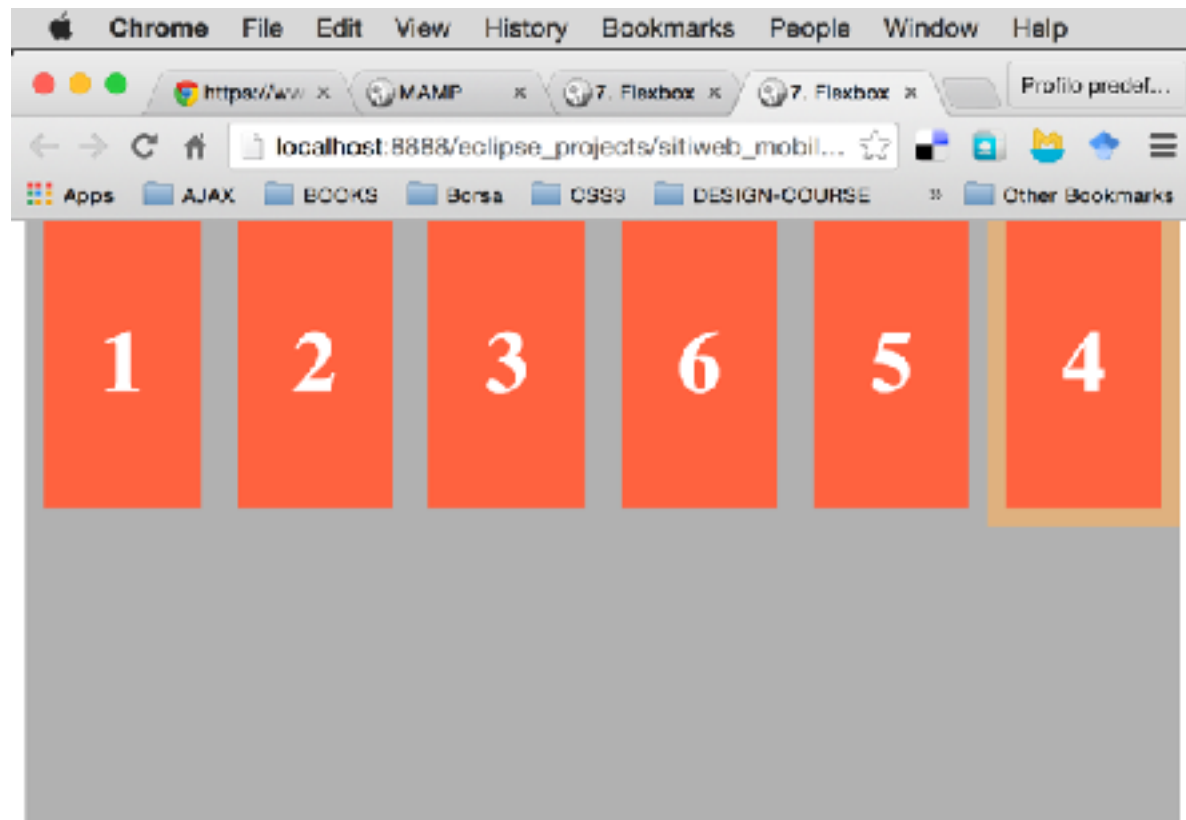
Flex box - 7



```
.flex-container {  
    display: -webkit-box;  
    display: -moz-box;  
    display: -ms-flexbox;  
    display: -webkit-flex;  
    display: flex;  
  
    align-content: space-around;  
}
```

```
<ul class="flex-container">  
  <li class="flex-item">1</li>  
  <li class="flex-item">2</li>  
  [...]  
</ul>
```

Flex box - 8

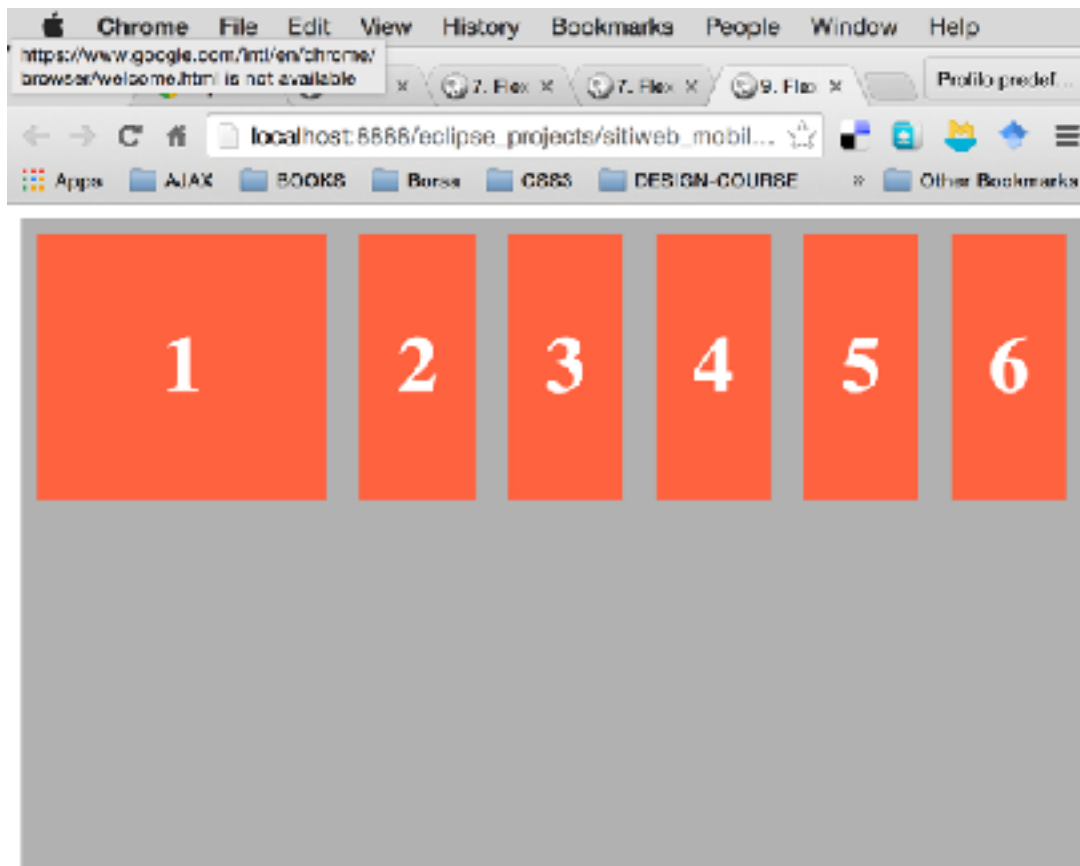


```
<ul class="flex-container">  
  <li class="flex-item">1</li>  
  <li class="flex-item">2</li>  
  [...]  
</ul>
```

```
.flex-container {  
  display: -webkit-box;  
  display: -moz-box;  
  display: -ms-flexbox;  
  display: -webkit-flex;  
  display: flex;  
}
```

```
.flex-item:nth-child(4) {  
  order: 6;  
  webkit-order: 6;  
}
```

Flex box - 9

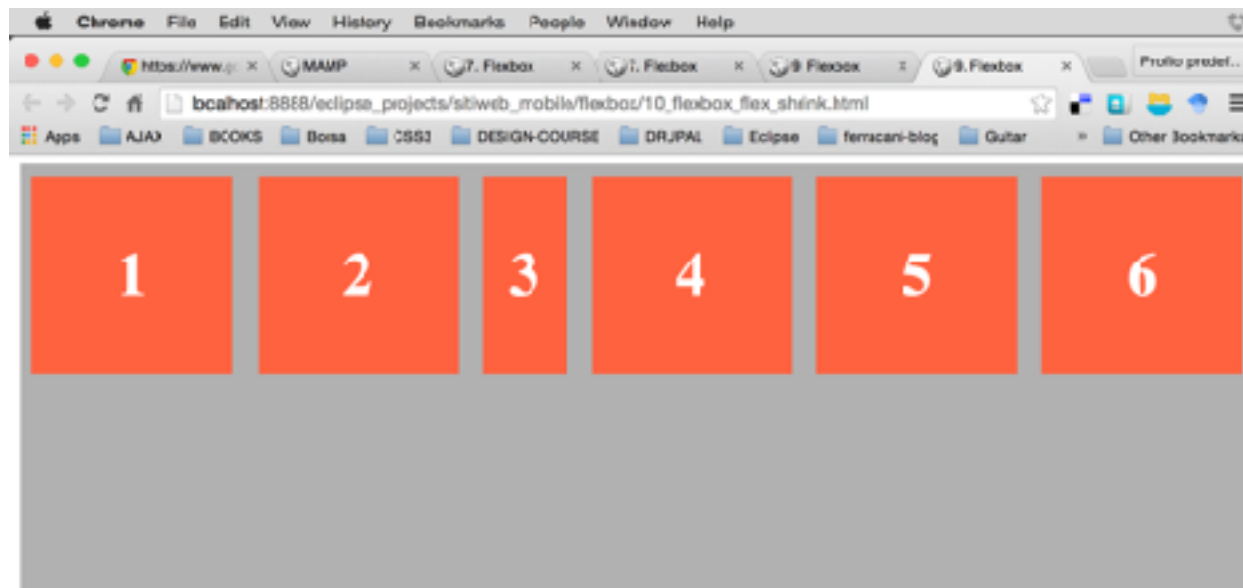


```
<ul class="flex-container">
  <li class="flex-item">1</li>
  <li class="flex-item">2</li>
  [...]
</ul>
```

```
.flex-container {
  display: -webkit-box;
  display: -moz-box;
  display: -ms-flexbox;
  display: -webkit-flex;
  display: flex;
}
```

```
.flex-item:nth-child(1) {
  flex-grow: 4;
  -webkit-flex-grow: 4;
}
```

Flex box - 10

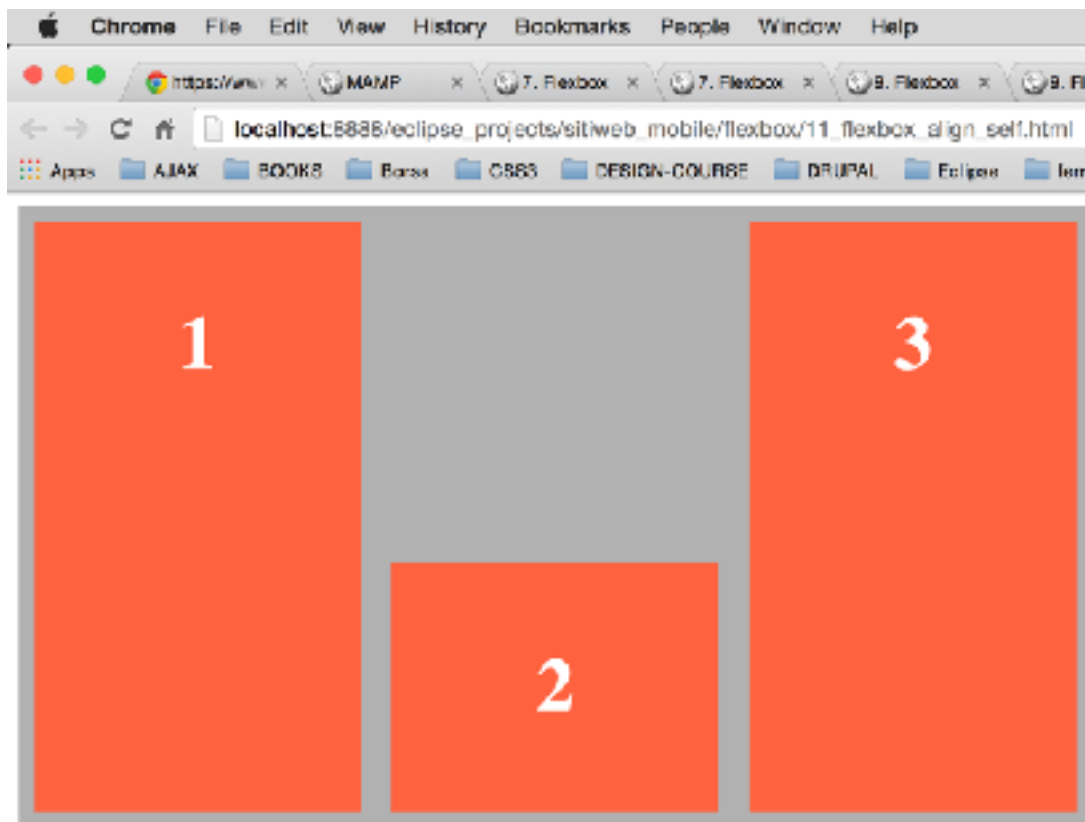


```
<ul class="flex-container">
  <li class="flex-item">1</li>
  <li class="flex-item">2</li>
  [...]
</ul>
```

```
.flex-container {
  display: -webkit-box;
  display: -moz-box;
  display: -ms-flexbox;
  display: -webkit-flex;
  display: flex;
}
```

```
.flex-item:nth-child(3) {
  flex-shrink: 3;
  -webkit-flex-shrink: 3;
}
```


Flex box - 11



```
<ul class="flex-container">
  <li class="flex-item">1</li>
  <li class="flex-item">2</li>
  [...]
</ul>
```

```
.flex-container {
  display: -webkit-box;
  display: -moz-box;
  display: -ms-flexbox;
  display: -webkit-flex;
  display: flex;
  align-items: stretch;
}
```

```
.flex-item:nth-child(2) {
  align-self: flex-end;
  -webkit-align-self: flex-end;
}
```

Flex box - Portfolio Template

Sviluppiamo un sito one-page **responsive** con **flexbox** - [Portfolio Demo](#)



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