

Development of Internet Applications

Bootstrap and others

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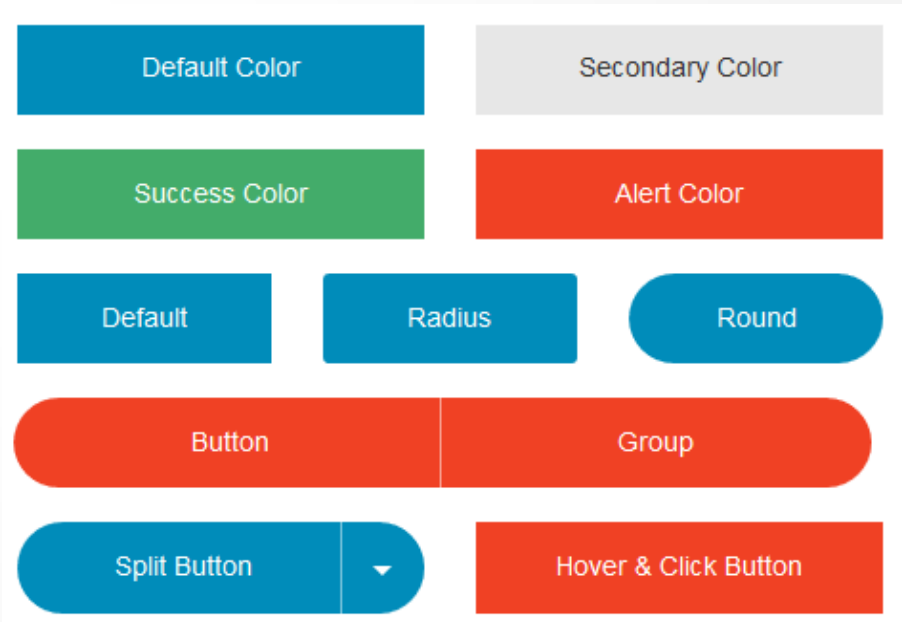
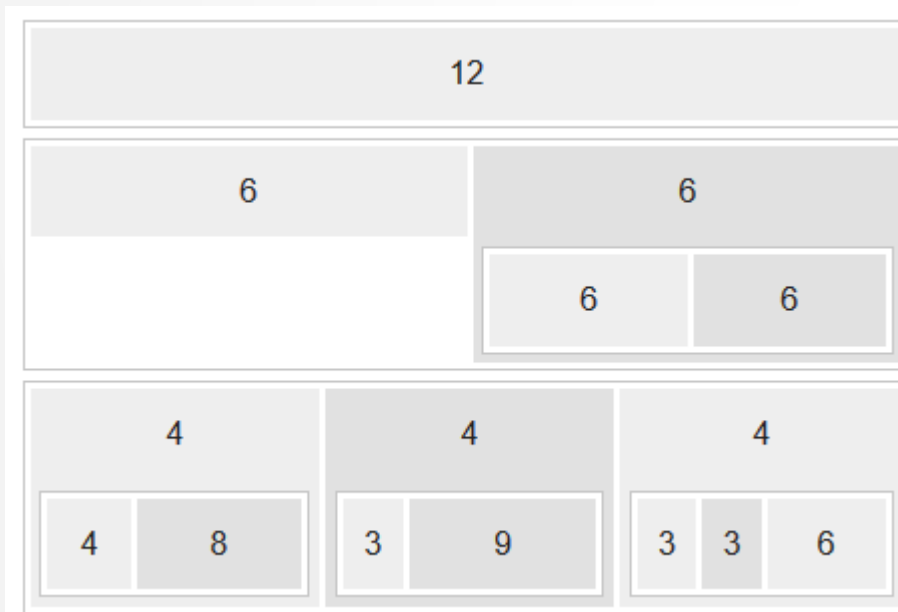
www.cs.vsb.cz/radecky

FrontEnd frameworks

- They offer tools for effective development of webdesign
- They are based on CSS frameworks (eg. Blueprint – grid, typography, form elements)
- They offer ...
 - Responsibility and multiplatform support
 - Layout development
 - Typography
 - **User controls**
 - Extensions and libraries
 - Accesibility
- Typically mobile-first approach
- Mix of HTML, CSS and JS
- Bootstrap, Foundation, Skeleton, etc.

Foundation

- <http://foundation.zurb.com/>
- Current version 6, MIT licence, 250 kb
- Preprocessor SASS, jQuery



Bootstrap

- <http://getbootstrap.com/>
- Current version 5, MIT licence, 250 kb
- Preprocesor LESS (portace SASS, version 4 in native way), jQuery

span 1	span 1	span 1	span 1	span 1	span 1	span 1	span 1	span 1	span 1	span 1	span 1
span 4				span 4				span 4			
span 4				span 8							
span 6						span 6					
span 12											



FrontEnd frameworks utilization

- It is always necessary to take into account efficiency and range of usage for a given project
- Pros
 - Fast development within „standardized“ environment
 - Native support of CSS preprocessors
 - Implementation of widely used controls (according to multiplatform operation)
 - Small entry barrier with spectacular results
 - Optimization based on composite construction
 - Themes
- Cons
 - Can be too complex for some purposes
 - Relation to a huge set of other tools and connected libraries (node.js, Grunt, Rails, Compass, etc.)

Bootstrap - grid

- <https://www.w3schools.com/bootstrap5/index.php>
- Fundamental view on page layout - **grid system** (12 cells)
- Container (responsive/fluid) – row – column
- Responsibility based on resolution

`.col-` (extra small devices - screen width less than 576px)

`.col-sm-` (small devices - screen width equal to or greater than 576px)

`.col-md-` (medium devices - screen width equal to or greater than 768px)

`.col-lg-` (large devices - screen width equal to or greater than 992px)

`.col-xl-` (xlarge devices - screen width equal to or greater than 1200px)

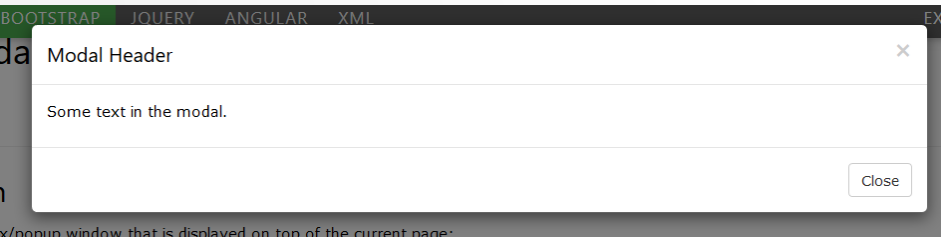
`.col-xxl-` (xxlarge devices - screen width equal to or greater than 1400px)

Bootstrap – look and feel

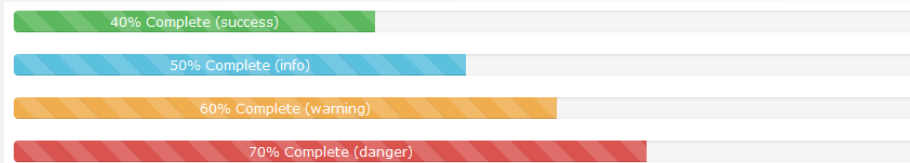
- **Native styling** – direct styling of some elements (h1-6, attr, blockquote, code, ...)
- **User defined styling** – based on assigned classes
- Basic approach is not to describe styling directly, but styling should be based on predefined styles (classes). Own styling is not necessary in principle.
- There is JS API based on jQuery for more sophisticated interaction

Bootstrap – visual elements

- Wide selection of visual elements (including some functionality) based on HTML specification and CLASS assignment
- Jumbotron, web heading, boxes, buttons, form elements, icons, modal windows, etc.



.../bootstrap window that is displayed on top of the current page:



Success! This alert box indicates a successful or positive action.

Info! This alert box indicates a neutral informative change or action.

Warning! This alert box indicates a warning that might need attention.

Danger! This alert box indicates a dangerous or potentially negative action.

Bootstrap – interaction with user

- It is possible to control many elements based on user behavior
- Usage of CSS or JS is not necessary
- Principle is based on **data-** attributes usage
eg. data-dismiss, data-toggle, data-target
- Usage of **aria-** attributes for accessible web support
(Accessible Rich Internet Applications) inc. Attribute **role**

Bootstrap – plugins and themes

- Possibility to use plugins
 - Native: Tooltip, Scrollspy, Carousel, Affix
 - External: <https://flatlogic.com/blog/top-24-free-essential-plugins-to-extend-bootstrap/>
- Possibility to „overwrite“ of styles based on themes
 - Based on inheritance and overwriting of CSS – never modify original Framework specification
 - External predefined extensions (themes) (beware of version mishmash)

Summary

- FrontEnd frameworks are very effective way to fast development of web applications
- Many things can be implemented without any knowledge of CSS or JS. However, there can be a huge relation to many other technologies in teh case of complex implementations
- Effective usage of frameworks on higher level is based on CSS preprocessors and other integration tools