

# Responsive Web Design using Bootstrap

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## Table of Content

1. Responsive Web Design.....	4
2. Bootstrap JS.....	5
2.1 Advantages of using Bootstrap.....	6
2.2 Pre-requisites.....	9

## 1. Responsive Web Design

There is a constant demand in the industry to make a website that is compatible with all kinds and sizes of devices. Responsive Web Design (RWD) is a web design approach aimed at designing websites that facilitates easy navigation with a minimum of resizing, panning, and scrolling—across a wide range of devices (from smart-phones to desktop monitors).

A site designed with RWD adapts the environment of the device by using fluid layout, proportion-based grids, flexible images, viewport based scaling and CSS media queries.

Fluid layout concept makes page element sizing based on percentages instead of absolute units like pixels or points.

Flexible images are also scaled according to the parent element instead of being of constant size.

To set the responsive environment, an appropriate meta tag is required to be placed in the head section of a web page

```
<meta name="viewport" content="width=device-width, initial-scale=1.0">
```

Media queries allow the page to use different CSS styles based on characteristics of device i.e. width of browser.

```
<link href="main.css" rel="stylesheet" type="text/css" media="screen" />
```

```
<link href="mobile.css" rel="stylesheet" type="text/css" media="screen and (max-width: 767px)" />
```

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

## 2. Bootstrap JS

Bootstrap is an open-source JavaScript framework created by Twitter. It is used for developing responsive, mobile first projects on the web. It is a combination of CSS and JavaScript code that can be used to build rich user interface.

In Visual Studio 2010 onwards, Bootstrap package can be downloaded via NuGet package. Bootstrap package or source-code can also be downloaded from <http://getbootstrap.com/getting-started/>

Set of files extracted from compressed Bootstrap folder are in following sequence:

```
bootstrap/  
  css/  
    bootstrap.css  
    bootstrap.min.css  
    bootstrap-theme.css  
    bootstrap-theme.min.css  
  js/  
    bootstrap.js  
    bootstrap.min.js  
  fonts/  
    glyphsicons-halflings-regular.eot  
    glyphsicons-halflings-regular.svg  
    glyphsicons-halflings-regular.ttf  
    glyphsicons-halflings-regular.woff
```

## 2.1 Advantages of using Bootstrap

The bunch of features available within Bootstrap files can be used to develop a website faster without writing CSS and JavaScript from scratch. Benefits of using Bootstrap as a front-end framework are:

- Mobile-first approach
- Browser compatibility
- Accessibility
- CSS grid system
- Ready-to-use components and utilities
- Resolution independent icons
- and more...

Some of the features included in Bootstrap are:

**Fluid Page:** This concept makes page element sizing based on percentages instead of absolute units like pixels or points. So as the width of screen decreases, the content automatically wraps to fit into the screen size. Whole content of web page can be placed into an `<div>` element using ***container*** or ***container-fluid*** class:

```
<div class=container-fluid">  
  ...  
</div>
```

**Section Hiding:** As the size of screen diminishes, the content should also decrease. In such cases you need to show only the important content that best fits on available screen. This can be done by hiding less important content. To hide a `<div>` tag in mobile or tablet browsers, use

```
<div class="hidden-xs hidden-sm">  
  ...  
</div>
```

**Proportion-based Grids:** Bootstrap divides each web-page into 12 columns. So to define the width of page, you can use ***col-lg-1*** to ***col-lg-12*** where col indicates column and lg indicates large screen. Similarly ***col-md-\**** indicates medium screen, ***col-sm-\**** indicates small screen and ***col-xs-\**** indicates extra small screen. Below code snippet indicates that the `<div>` width will be different for different screen size i.e. for extra small and small screens the width will be of 12 columns; whereas for medium size screens the width will be of 9 columns.

```
<div class="row">  
  <div class="col-xs-12 col-sm-12 col-md-9">  
    ...  
  </div>  
</div>
```

**Flexible Images:** Bootstrap scale images according to the parent element instead of being of constant size. This is achieved by using ***img-responsive*** class:

```

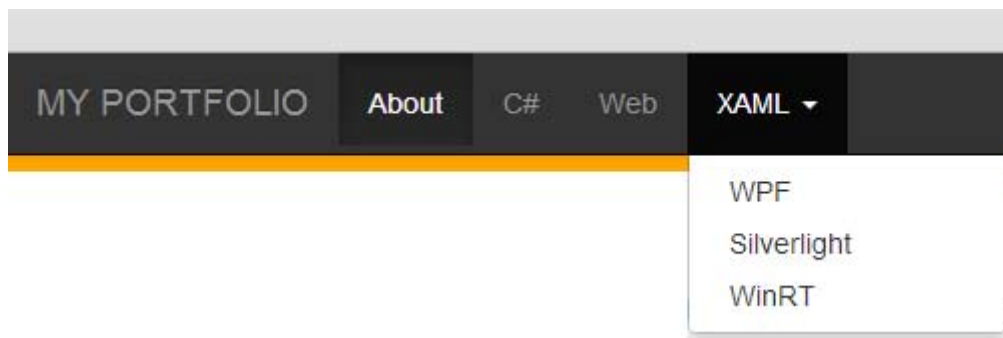
```

Round cornered, circular or thumbnail style borders can also be applied to images by using ***img-rounded***, ***img-circle*** or ***img-thumbnail*** class respectively.

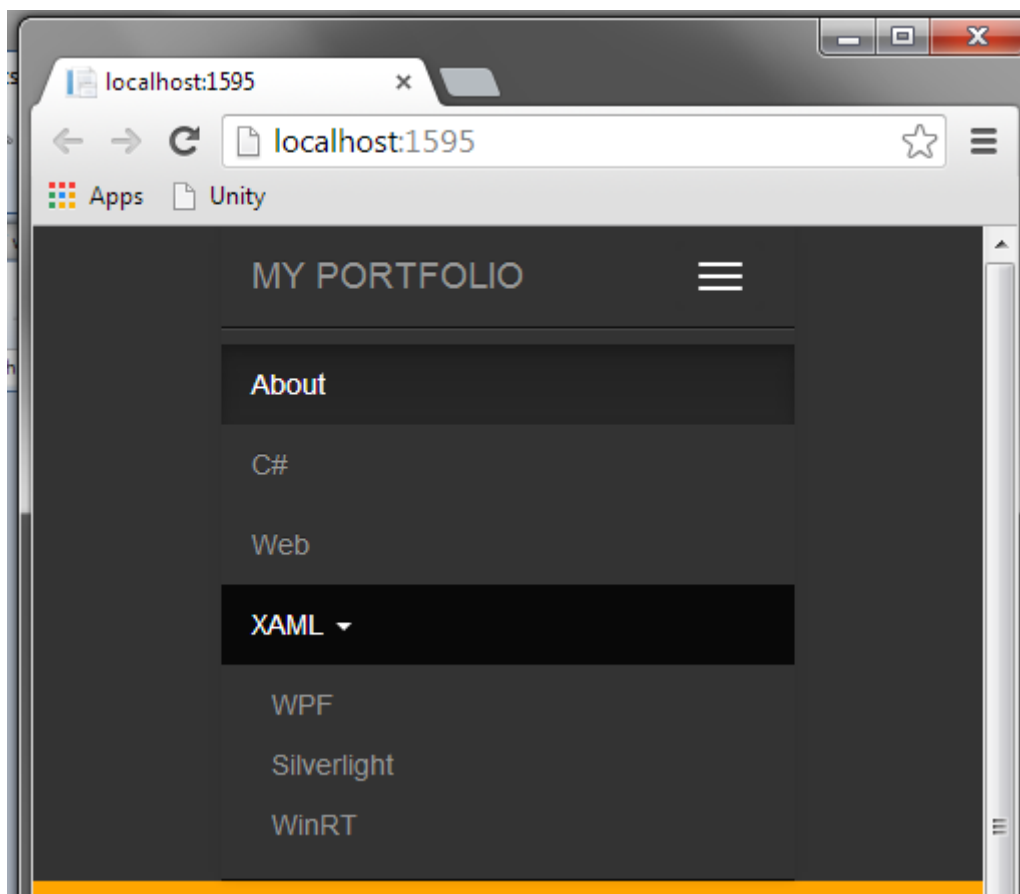
**Responsive Navigation:** Almost each website has a menu bar on top that helps user to navigate easily within a website. However when this website is viewed in smaller devices such as smart phone, then it becomes very irritating for user to click on the menu item due to its contracted size. Bootstrap makes the menu compact and expandable in the form of drop-down. This is achieved by using **navbar** class:

```
<nav class="navbar navbar-default navbar-fixed-top" role="navigation">
  <div class="container">
    ...
  </div>
</nav>
```

For example, this is how the menu looks in big screen:



Whereas in a tablet or smart-phone, menu becomes compact and in single column:



**Responsive Tables:** Create responsive tables by wrapping any table in **table-responsive** class to make them scroll horizontally on small devices. Stylish format can be applied to table by using **table**, **table-striped**, **table-bordered** or **table-hover** classes. The class **hidden-print** can be used along with table to hide any content while printing.

**Stylish Buttons** can be easily created by applying ready-made classes to <button> tag such as **btn-default**, **btn-primary**, **btn-success**, **btn-info**, **btn-warning**, **btn-danger** or **btn-link**. These are how fancy buttons looks like:



Progress bar, modal dialog boxes, alerts, pagination, bread crumb, etc. are many more features provided by Bootstrap that can be used to enhance website appearance.

A typical web-page with implementation of Bootstrap looks like:

```
<!DOCTYPE html>
<html lang="en">
  <head>
    <meta charset="utf-8">
    <meta http-equiv="X-UA-Compatible" content="IE=edge">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <title>Bootstrap Demo</title>
    <link rel="stylesheet" href="css/bootstrap.css">
  </head>
  <body>
    <h1>Hello, world!</h1>
    <div class="row">
      <div class="col-xs-12 col-sm-12 col-md-9">
        ...
      </div>
    </div>
    ...
    <script src="js/bootstrap.js"></script>
  </body>
</html>
```



## 2.2 Pre-requisites

Bootstrap works in browsers that supports HTML5 and CSS3. jQuery is also mandatory for Bootstrap scripts to work.

To enable RWD in old browsers (for example IE8 and older) that doesn't support CSS3 Media Queries, an additional JavaScript library known as ***Respond.js*** is required.