

Internet and Web Principal

Week 11

Bootstrap 1

Content

1. Introduction to Bootstrap
2. Structure of the page
3. Typography
4. Tables

Introduction to Bootstrap

Bootstrap is a free and open source front-end programming framework for building websites and online applications. Bootstrap is a set of vocabulary for template designs that was created to enable responsive building of mobile-first websites.

Bootstrap, as a framework, incorporates the fundamentals of responsive web development, so developers just need to put code into a pre-defined grid structure. The Bootstrap framework is composed of Hypertext Markup Language (HTML), CSS, and JavaScript. Web developers that use Bootstrap can create websites considerably faster since they don't have to worry about basic commands and functionalities.

Introduction to Bootstrap

Bootstrap enables responsive web design. It allows a web page or app to recognize the visitor's screen size and orientation and automatically adjust the display. The mobile-first strategy implies that employees' primary tools for getting work done are smartphones, tablets, and task-specific mobile apps. Bootstrap covers the design needs of various technologies by including UI components, layouts, JavaScript tools, and an implementation framework. Precompiled or source code versions of the program are available.

Introduction to Bootstrap

Generally, Bootstrap 4 is distributed using the repositories Bower (via Github) and NPM (node package manager). Moreover, you also can create your own distribution and use to the source code that connects/links directly to the website. Bootstrap also utilizes the raw files of the cascading stylesheets language SASS—this is a precompiler that translates into CSS

Introduction to Bootstrap

Installation

You can load bootstrap from a CDN (content delivery network) or locally. The local version can be pulled from Bower, npm, Github, or the Bootstrap website respectively.

CDN

Bootstrap is available via MaxCDN. A CDN enables a website to frequently retrieve used public files from globally distributed servers. When a user from the United States invokes your host in Germany, then the CDN will ensure that the bootstrap files are retrieved from a server in the United States. This relieves your server, the lines of the provider, the Internet in general and the user experiences a faster download. Basically it is a win–win. If you program on the intranet, a CDN is in contrast not to your advantage is not to your advantage. If you expect only local users in Germany, there is no advantage to a CDN.

The bootstrap files are included when using the CDN as follows (the backslash at the end of line conotates the line break and is not part of the URL):

Introduction to Bootstrap

```
1 <!-- The latest compiled and minimized CSS -->
2 <link rel="stylesheet" href="https://maxcdn.bootstrapcdn.com/bootstr\
3 ap/4.0.0/css/bootstrap.min.css">
4
5 <!-- Optional Theme -->
6 <link rel="stylesheet" href="https://maxcdn.bootstrapcdn.com/bootstr\
7 ap/4.0.0/css/bootstrap-theme.min.css">
8
9 <!-- The latest compiled and minimized JavaScript -->
10 <script src="https://maxcdn.bootstrapcdn.com/bootstrap/4.0.0/js/boot\
11 strap.min.js"></script>
```

Introduction to Bootstrap

Repository for Local Installation

To obtain a local copy, you can use either Bower² or npm³. Bower is for general front-end development, while NPM is the repository (node package manager) for Node.js.

Install with Bower

You can get Bootstrap's SASS, CSS, JavaScript, and other files using Bower to install and manage.

`$bower install bootstrap#4.0` Bower retrieves data from a separate repository, usually directly from GitHub. Bower itself is a node package so it requires Node. If you have not worked with Bower, please observe the following conditions:

First, install a Git client suitable for your operating system

Install Node.js—which automatically will bring the Node Packet

Manager npm

Install Bower by NPM

`$npm install bower -g`

Introduction to Bootstrap

Install using NPM

By using Bootstrap, npm is installed as follows:

```
$npm install bootstrap@next
```

If you are using npm, you will probably use Node.js. Bind bootstrap as follows in your node application files:

```
require('bootstrap')
```

This command loads bootstraps jQuery plug-ins in the jQuery object. The module bootstrap itself has exported nothing. You can download the jQuery plug-ins individually by loading the `*/js/.js*`- files in the root directory of the package.

Structure of the page

Structure of the CSS Files

The complete structure of an environment that uses Bootstrap is as follows:

```

1  bootstrap/
2  |  └── css/
3  |      ├── bootstrap.css
4  |      ├── bootstrap.css.map
5  |      ├── bootstrap.min.css
6  |      └── bootstrap.min.css.map
7  |      ├── bootstrap-flex.css
8  |      ├── bootstrap-flex.css.map
9  |      ├── bootstrap-flex.min.css
10 |      ├── bootstrap-flex.min.css.map
11 |      ├── bootstrap-grid.css
12 |      ├── bootstrap-grid.css.map
13 |      ├── bootstrap-grid.min.css
14 |      ├── bootstrap-grid.min.css.map
15 |      ├── bootstrap-reboot.css
16 |      ├── bootstrap-reboot.css.map
17 |      ├── bootstrap-reboot.min.css
18 |      └── bootstrap-reboot.min.css.map

```

```

19 |  └── js/
20 |      ├── bootstrap.js
21 |      └── bootstrap.min.js
22 |  Font-Awesome/
23 |      ├── css/
24 |          ├── fontawesome.css
25 |          ├── fontawesome.css.map
26 |          └── fontawesome.min.css
27 |          └── fonts/
28 |              ├── fontawesome-webfont.eot
29 |              ├── fontawesome-webfont.svg
30 |              ├── fontawesome-webfont.ttf
31 |              ├── fontawesome-webfont.woff
32 |              └── fontawesome-webfont.woff2
33 |  Tether/
34 |      ├── js/
35 |          └── tether.js
36 |      └── css/
37 |          ├── tether.css
38 |          └── tether.min.css

```

Structure of the page

Page Building

Once everything is ready, you can create the first page. This page should provide the basic layout of the entire application. A first version might look like this (backslashes remark line breaks):

```
1 <!DOCTYPE html>
2 <html lang="en">
3   <head>
4     <meta charset="utf-8">
5     <meta name="viewport" content="width=device-width, initial-scale\
6 =1, shrink-to-fit=no">
7     <meta http-equiv="x-ua-compatible" content="ie=edge">
8
9     <link rel="stylesheet" href="https://maxcdn.bootstrapcdn.com/boo\
10 tstrap/4.0.0/css/bootstrap.min.css" crossorigin="anonymous">
11   </head>
12   <body>
13     <h1>Hello Bootstrap 4</h1>
14
15     <script src="https://ajax.googleapis.com/ajax/libs/jquery/2.1.4/\
16 jquery.min.js"></script>
17     <script src="https://maxcdn.bootstrapcdn.com/bootstrap/4.0.0/js/\
18 bootstrap.min.js" crossorigin="anonymous"></script>
19   </body>
20 </html>
```

The first three metatags from line 4 must be at the beginning of the <head> block.

Structure of the page

The Grid System

Already in the early years of the web, there has been an attempt of a kind of virtual grid (grid) to give structure. At the beginning tables were used most often. However, tables are rigid in their horizontal extension—the content determines the width. A scaling to a smaller screen is not possible.

The idea of the table shows the procedure, rather than simply having the cells take `<div>`-tags and then define the grid-like using CSS. Who has tried it once may have quickly realized that the approach is anything but trivial. CSS frameworks therefore provide a solid foundation. In fact, the screen is more of an array of strips, in which the screen is divided and the width can be adapted.

Structure of the page

Container

Bootstrap utilizes a container element to initiate the page and find a basis for the grid. Containers can be used multiple times on the page, but should not be nested.

```
1 <div class="container">  
2   ...  
3 </div>
```

Containers of this type provide a solid, centered, and responsive grid. That is, the width adapts jumps in the device's width and then remains stable within a range. The jump areas are referred to as "breakpoints." If you already know the concept of software development—the breakpoints in Bootstrap has nothing in common with this.

Alternatively, the class *.container-fluid* can be used, which always uses the full width of the device:

```
1 <div class="container-fluid">  
2   ...  
3 </div>
```

Structure of the page

The Grid in Detail

The grid is formed by twelve (12) equal width columns. Predefined classes can be used to place elements on a given column and span a number of columns at a time. Inside the columns are rows that can be defined to allow an alternate use of the column widths. The procedure should be based on a few rules:

- Series (.row) must be in a container (.container (fixed width) or .container-fluid (full width))
- Series may be used horizontally to place multiple elements side- by-side.
- Columns (.col-xx-n) may be placed in rows. Only column elements are immediate child elements of rows.
- Column spacing (gap between columns) is defined using padding-rules. These distances are to the left of the first column and the right of the last column with negative intervals (margin) balanced. This content is aligned outside of the grid's left- aligned equal.
- If the elements need columns that can be placed within a row and exceed the elements limit of twelve columns, then the whole

Structure of the page

The structure of the column classes is simple:

- The introduction begins with col-
- The middle part determines the jurisdiction for screen widths (xs, sm, md, lg)—the breakpoints.
- The number at the end determines the number of columns (1 to 12).

If you use the class `.col-xs-4`, you can have 3 juxtaposing decorated elements ($3 \times 4 = 12$). The higher (larger device) definition applies until it is overwritten. You can use `.col-md-2`, `.col-lg-2`, than “MD” is not valid for very large devices

Structure of the page

Listing 3-1. Pattern grid (Grid.html)

```

1 <div class="container">
2   <div class="row">
3     <div class="col-md-1">1</div>
4     <div class="col-md-1">2</div>
5     <div class="col-md-1">3</div>
6     <div class="col-md-1">4</div>
7     <div class="col-md-1">5</div>
8     <div class="col-md-1">6</div>
9     <div class="col-md-1">7</div>
10    <div class="col-md-1">8</div>
11    <div class="col-md-1">9</div>
12    <div class="col-md-1">10</div>
13    <div class="col-md-1">11</div>
14    <div class="col-md-1">12</div>
15  </div>
16  <div class="row">
17    <div class="col-md-8">1-8</div>
18    <div class="col-md-4">9-12</div>
19  </div>
20  <div class="row">
21    <div class="col-md-4">1-4</div>
22    <div class="col-md-4">5-8</div>
23    <div class="col-md-4">9-12</div>
24  </div>
25  <div class="row">
26    <div class="col-md-6">1-6</div>
27    <div class="col-md-6">7-12</div>
28  </div>
29 </div>
    
```

Desktop

1	2	3	4	5	6	7	8	9	10	11	12
1-8								9-12			
1-4				5-8				9-12			
1-6						7-12					

Mobile

1
2
3
4
5
6
7
8
9
10
11
12
1-8
9-12
1-4
5-8
9-12
1-6
7-12

Typography

Bootstrap defines styles for some elements directly in HTML, the basic type of ad, typography, and color. In contrast to the classic concept of typography, font, writing, design, and printing material included, Bootstrap is quite modest in its ease of use. The following are specifically regulated:

- The background color of the page is white, background-color: #fff
- In the SASS files the following variables are responsible for the basic design:
 - \$font-family-base
 - \$font-size-base
 - \$line-height-base
- Hyperlinks as outstanding elements of web pages are determined by the following variables:
 - \$link-color
 - Underline links should only be used with floating cursor (:hover)

The variables are in the file `_scaffolding.sass` and are easy to find.

Typography

Headings

All headings from `<h1>` to `<h6>` are directly supported. You must not use any other classes. But if you wish to use the same font size as a heading, the text should use the classes `.h1` to `.h6`. See Figure 4-1 for an example of headings.

- h1: Bold 2.5 rem / 40 px (Basis × 2.6)
- h2: Bold 2 rem / 32 px (Basis × 2.15)
- h3: Bold 1.75 rem / 28 px (Basis × 1.7)
- h4: Bold 1.5 rem / 24 px (Basis × 1.25)
- h5: Bold 1.25 rem / 20 px (standard size)
- h6: Bold 1 rem / 16 px (Basis × 0.85)

Typography

Text and Text Elements

For text and text elements, HTML has many references and has class supplements for special effects.

Basic Font

The default font for the text is 16 px. The line height used is 1.15. For sections created with `<p>` they will receive half the row height, about 10 px.

To single out one section, the class `.lead` is used as shown in Figure 4-2.

1 `<p class="lead">Important paragraph...</p>`

2 `<p>Standard paragraph </p>`



Figure 4-2. Paragraph style

Typography

Text Elements

Text elements are used for parts of the body text. This is done mainly through HTML, no more classes. The elements also serve to strengthen the semantic content. Figure 4-3 shows various semantic elements in the text. The following text elements are explicitly supported.

`<mark></mark>`

This text is highlighted (as with a highlighter) emphasizing relevance.

``

This indicates that a part of the text has been deleted, which is indicated by a strikethrough.

`<s></s>`

This indicates that a part of the text is no longer relevant.

`<ins></ins>`

This tag indicates that the body part has been added allowing a user to signal a last text change.

Typography

`<u></u>`

This tag indicates by underlining that the text provides additional information.

``

Highlights part of the text with emphasis thereby showing its importance.

Another tag fits in this category, `<small></small>`, but it has a less important semantic reference. To achieve a “lighter” display you can reduce the font size to 85%. To do the opposite of this, you should use ``.

Typography

Bootstrap supports the continued nonsemantic elements `` and `<i></i>`. They react in the text similar to `` and ``. However `<i></i>` sometimes is used for icons (icon), which do not contain text and therefore ignore the behavior displayed by italic font and enter an element with a certain semantic meaning. However, the behavior and the interpretation is not standard compliant, but more of a stylistic measure. Some elements are marked more semantically.

```
<abbr title="Abbreviation">Abbr.</abbr>
```

This element identifies abbreviations, but an attribute title is required. The element is marked with a dotted underline and displays the title when the mouse pointer hovers over it. In addition, the font can be reduced with the class `.initialism` to have a less disruptive effect in the text.

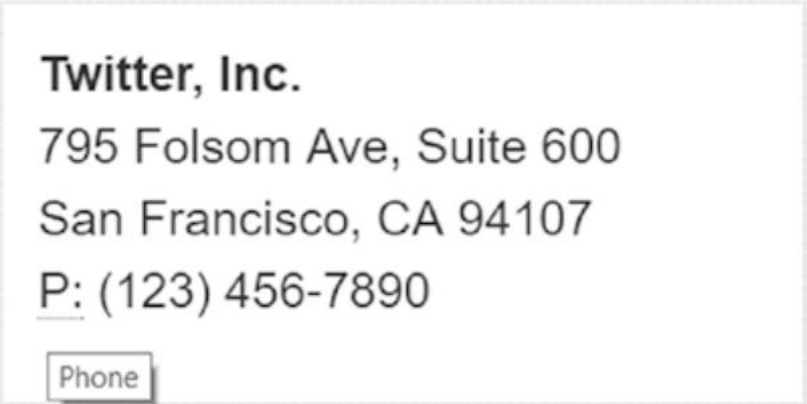
```
<abbr title="HyperText Markup Language"  
class="initialism">HTML</abbr>
```

Typography

Elements for Text Blocks

The element `<address></address>` can make it easy to detect addresses. This element is not formatted. If formatting is to be retained additional line breaks with `
` elements are required.

```
<address>  
<strong>Twitter, Inc.</strong><br>  
795 Folsom Ave, Suite 600<br>  
San Francisco, CA 94107<br>  
<abbr title="Phone">P:</abbr> (123) 456-7890  
</address>
```



Twitter, Inc.
795 Folsom Ave, Suite 600
San Francisco, CA 94107
P: (123) 456-7890

Phone

Typography

Orientation

The alignment of text is up to your creative nature.

text-left: Left aligned

text-center: Text is centered

text-right: Right aligned

text-justify: Justified

text-nowrap: Obstruction of upheaval

In addition, there are alignment variants that are only valid for certain viewports.

text-xs-left: Left aligned when the viewport “xs” is used.

text-xs-center: Text is centered when the viewport “xs” is used.

text-xs-right: Right aligned when the viewport “xs” is used.

This also applies for “sm,” “md,” “lg,” and “xl.” Listing 4-1 and Figure 4-7 demonstrate some text alignments.

Typography

Listing 4-1. Alignment of text (Typo_TextAlign.html)

```
1 <p class="text-left">Left aligned.</p>  
2 <p class="text-center">Text is centered. </p>  
3 <p class="text-right">Right aligned.</p>  
4 <p class="text-justify">Justified ...</p>  
5 <p class="text-nowrap">Obstruction of Upheaval, ...</p>
```

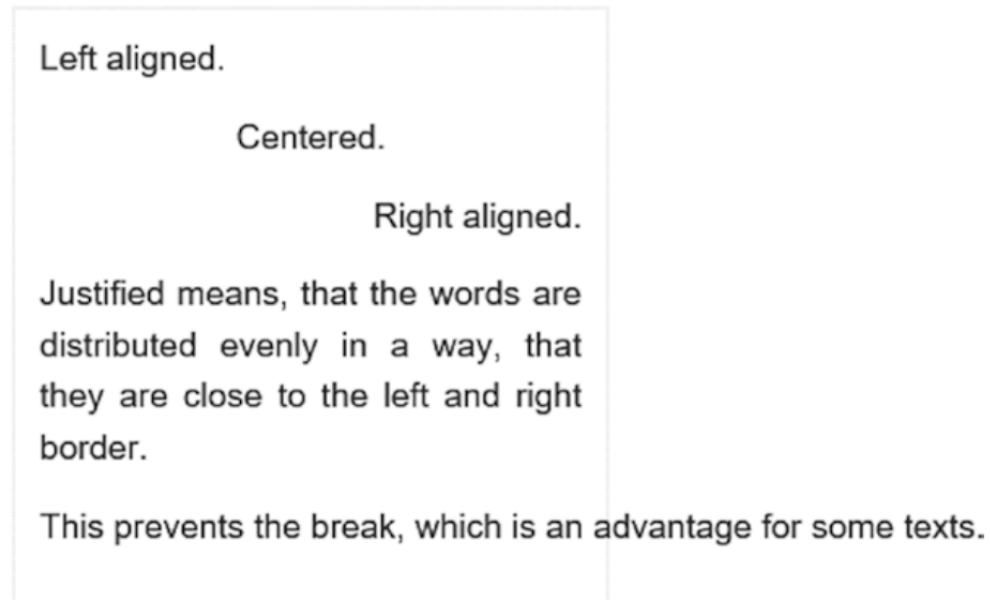


Figure 4-7. Aligning text

Typography

Transformations convert text from lowercase to uppercase and vice versa. Listing 4-2 and Figure 4-8 provide information on transformations.

- `text-lowercase`: Converts to lowercase
- `text-uppercase`: Converts to uppercase
- `text-capitalize`: First letter of each word is capitalized.
- `text-weight-bold`: Bold without an explicit tag.
- `text-weight-normal`: Normal weight without an explicit tag
- `text-italics`: Italics without an explicit tag

Typography

Listing 4-2. Transformations (Typo_TextTransform.html)

```
1 <p class="text-lowercase">lowercase</p>  
2 <p class="text-uppercase">uppercase</p>  
3 <p class="text-capitalize">title case</p>
```



Figure 4-8. Text transformation

Typography

Lists

There are two types of lists: with order and in no particular order. Without order they are represented in HTML by bullet points. In Bootstrap you also can waive these symbols and create a simple “element stack.”

If the default style used and there are icons not needed, they can be removed by the class `.list-unstyled`. This will affect only the immediate members not the deeper nesting levels. Note here that the removal of the symbols means that the items are no longer engaged. This must be offset by a distance where appropriate.

```
<ul class="list-unstyled">
```

```
<li>...</li>
```

```
</ul>
```

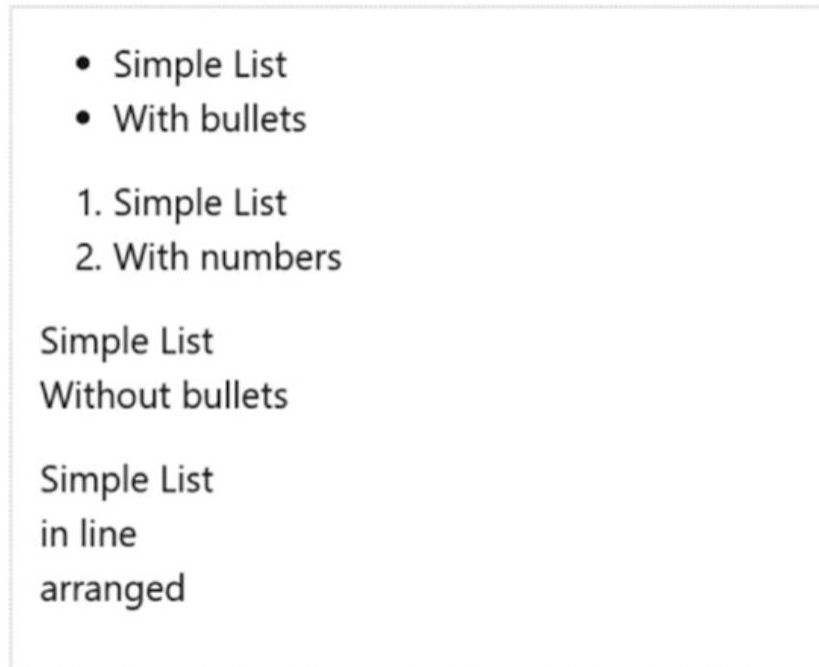
Typography

These are often defined as lists, and then lose that nature by CSS. The advantage over tables or definition lists is their particularly compact notation—usually two letters per element. The class `.list-inline` is then necessary to place the elements in horizontal direction (see Figure 4-9).

```
<ul class="list-inline">
```

```
<li>...</li>
```

```
</ul>
```



Tables

It has been noted that tables are not suited to build responsive sites. Nevertheless, tables are suited for sorting and listing data. The width of the table must comply with the criteria of the grid. A placement outside of the grid is possible. In this case Bootstrap offers several styles to improve the presentation. For responsive environments tables are offered with horizontal scrolling.

Styles for Tables

Tables themselves have a native element in HTML. Nevertheless bootstrap relies on the class *.table*. This is because tables are used by many other libraries and plugins, such as Calendar. To avoid changes to these tables accidentally by Bootstrap this additional class is required.

```
<table class="table">
```

```
...
```

```
</table>
```

Tables

Tables consist of two parts: header (`<thead></thead>`) and content (`<tbody></tbody>`). The content can occasionally be very long. The readability can be significantly increased by an alternating background color—called the crosswalk effect. You can reach it with the class `.table-striped`. Figure 4-11 gives an example of such a table.

```
<table class="table table-striped">
```

...

```
</table>
```

Another style for the table is `.table-bordered`, a frame is applied to all the cells.

```
<table class="table table-bordered">
```

...

```
</table>
```

More interactive is `.table-hover`, bringing a mouse effect when hovering over rows of a table.

```
<table class="table table-hover">
```

...

```
</table>
```

Tables

If space is in short supply, the distances used by the default can be reduced with `.table-condensed`. The table can be reduced by 50%.

```
<table class="table table-condensed">
```

...

```
</table>
```

Name	Action
Anton Muller	Edit Delete
Bob Thornten	Edit Delete
Britney Belle	Edit Delete
2	

Figure 4-11. A table that is partly condensed with header and footer

Tables

Responsive Tables

In the strictest sense, responsive tables do not exist. If `.table-responsive` used, especially in widths below 786 px, a horizontal scrollbar under the table is created. Figure 4-15 shows a table with a horizontal scrollbar. This will prevent the need that the entire page has to scroll horizontally. In addition, `overflow-y: hidden` suppresses all elements that will protrude upward or downward from the table.

```
<table class="table table-responsive">  
...  
</table>
```



Name	Action
Anton Muller	Edit Del
Bob Thornten	Edit Del
Britney Belle	Edit Del

Tables

True Responsive Tables

Bootstrap's responsive answer to tables with `.table-reflow` is not always satisfactory.

In particular, the behavior is not customizable to fit your need. Ultimately, the HTML element `<table>` just is not always what you need. Complex tables with many columns, as those in Figure 4-16, cannot condense as necessary.

Code	Company	Price	Change	In %	Opening	Max	Min	Volume
MSC	Microsoft	\$1.38	-0.01	-0.36%	\$1.39	\$1.39	\$1.38	9,395
APP	Apple	\$1.99	-0.03	-0.45%	\$1.88	\$2.15	\$1.38	7,741

Figure 4-16. Full-width table

Tables

True Responsive Tables

Bootstrap's responsive answer to tables with `.table-reflow` is not always satisfactory.

In particular, the behavior is not customizable to fit your need. Ultimately, the HTML element `<table>` just is not always what you need. Complex tables with many columns, as those in Figure 4-16, cannot condense as necessary.

Code	Company	Price	Change	In %	Opening	Max	Min	Volume
MSC	Microsoft	\$1.38	-0.01	-0.36%	\$1.39	\$1.39	\$1.38	9,395
APP	Apple	\$1.99	-0.03	-0.45%	\$1.88	\$2.15	\$1.38	7,741

Figure 4-16. Full-width table

Tables

But the same table could be changed into a list that could be fully responsive as shown in Figure 4-17.

Code	MSC
Company	Microsoft
Price	\$1.38
Change	-0.01
In %	-0.36%
Opening	\$1.39
Max	\$1.39
Min	\$1.38
Volume	9,395

Code	APP
Company	Apple
Price	\$1.99
Change	-0.03
In %	-0.45%
Opening	\$1.88
Max	\$2.15
Min	\$1.38
Volume	7,741

Figure 4-17. Table at narrow width

Thank You

Alfred Tenggono, S.Kom., M.Kom.

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Reference

- Introducing Bootstrap 4, Jörg Krause, Apress, 2016, ISBN: 978-1-4842-2381-9