بسم الله الرحمن الرحیم

تکنولوژی کامپیوتر

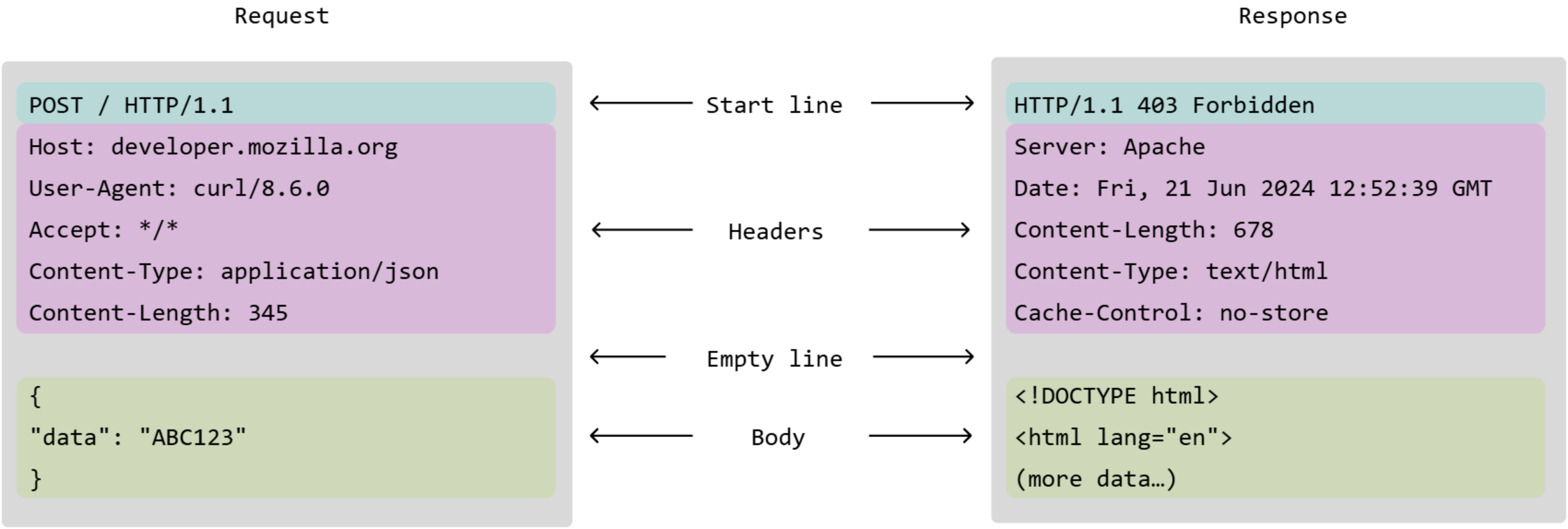
جلسه‌ی هشتم

برنامه‌نویسی وب – فرانت‌اند

Original Images / Texts of this lecture: https://developer.mozilla.org/en-US/docs

جلسه‌ی گذشته

عمیق‌شدن در اچ تی تی پی – پیاده‌سازی HTTP Server



Request

```
POST / HTTP/1.1
Host: developer.mozilla.org
User-Agent: curl/8.6.0
Accept: */*
Content-Type: application/json
Content-Length: 345

{
"data": "ABC123"
}
```

Start line

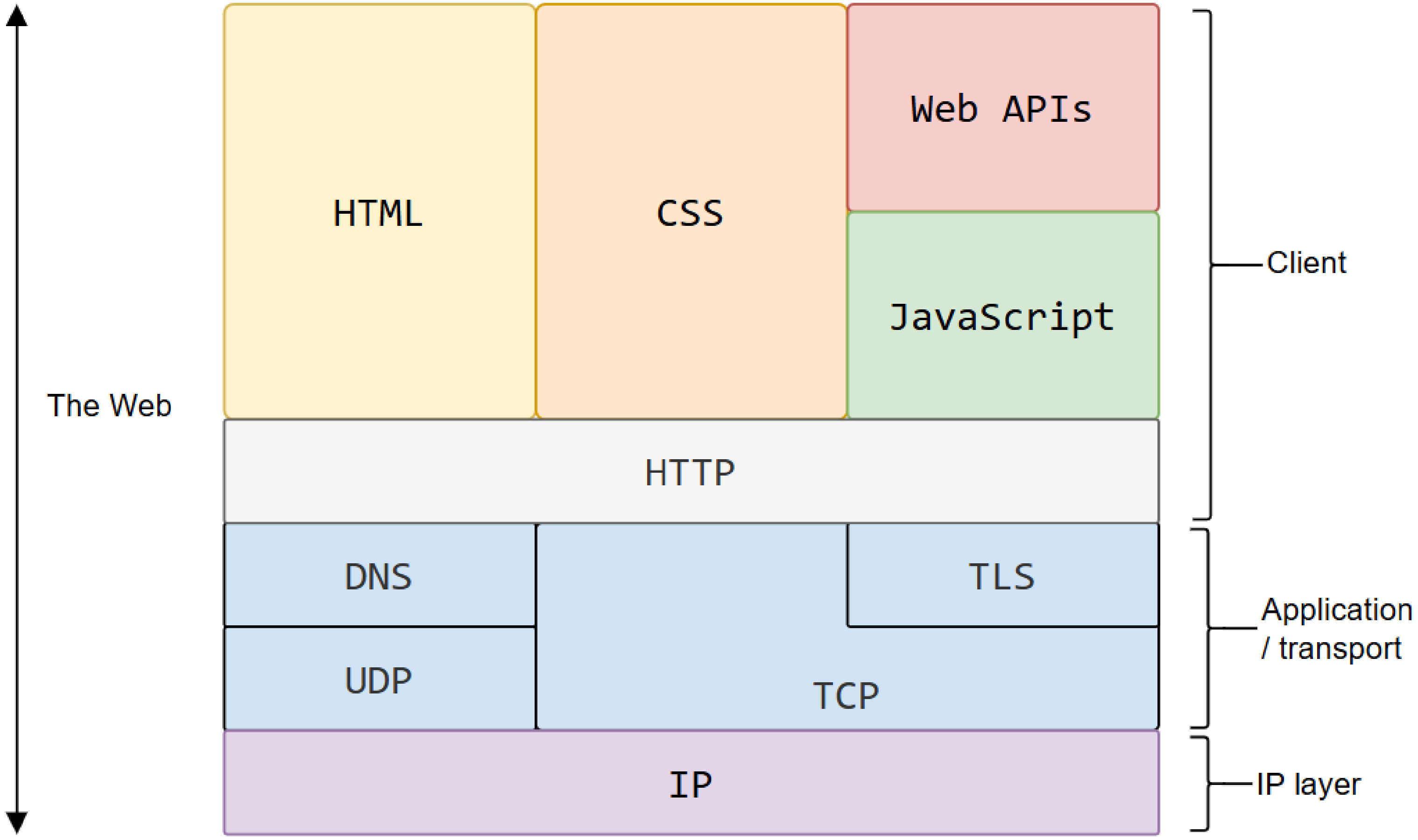
Headers

Empty line

Body

Response

```
HTTP/1.1 403 Forbidden
Server: Apache
Date: Fri, 21 Jun 2024 12:52:39 GMT
Content-Length: 678
Content-Type: text/html
Cache-Control: no-store

<!DOCTYPE html>
<html lang="en">
(more data…)
```



The Web

HTML

CSS

Web APIs

JavaScript

HTTP

DNS

TLS

UDP

TCP

IP

Client

Application
/ transport

IP layer

جلسه‌ی جدید

Note! Browser Support…

HTML

HyperText Markup Language

HTML file

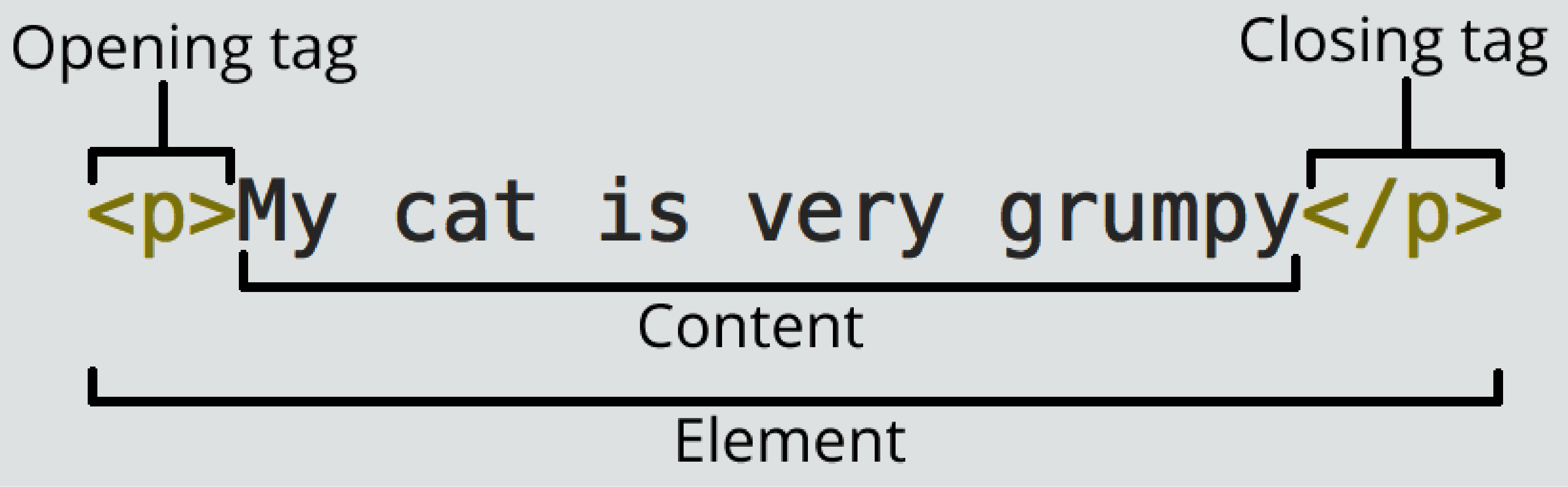
- An HTML document is a plaintext document structured with elements
- Elements are surrounded by matching opening and closing tags
- Each tag begins and ends with angle brackets (<>)
- There are a few empty or void elements that cannot enclose any text, for instance <img>

HTML file

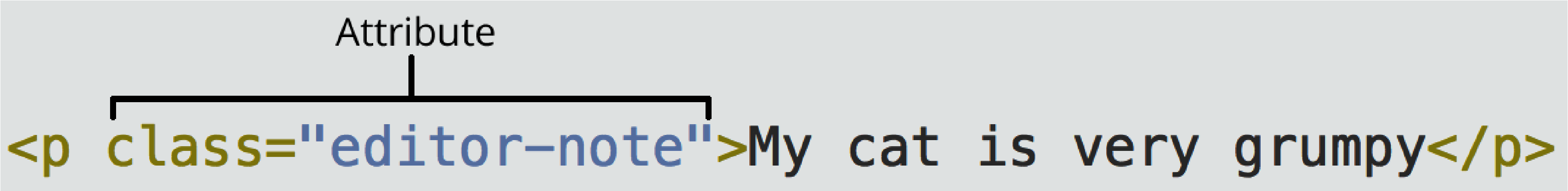
- An HTML file is normally saved with an .htm or .html extension

HTML SYNTAX

Anatomy of an HTML element



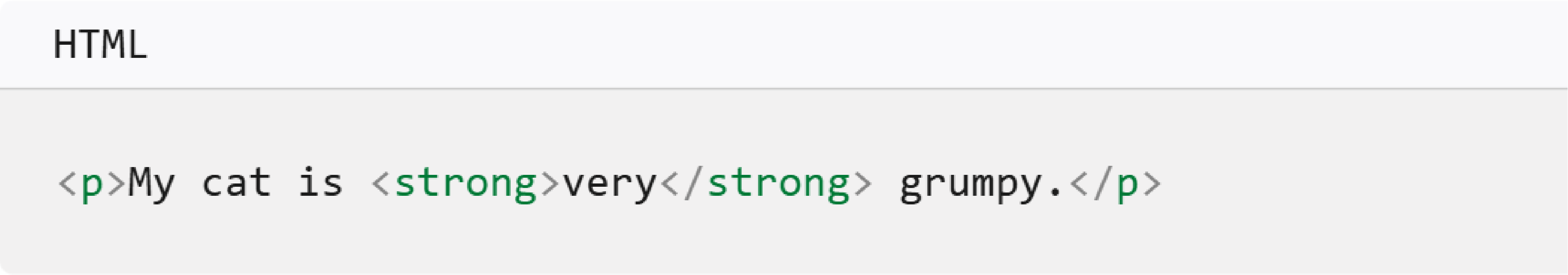
Anatomy of an HTML element



```
<p class="editor-note">My cat is very grumpy</p>
```

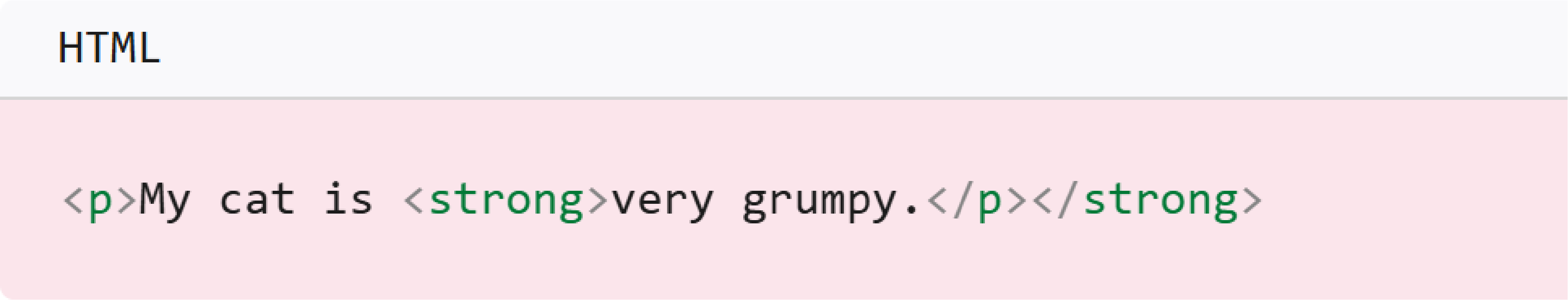
- Attributes that set a value always have:
  - *A space between it and the element name (or the previous attribute, if the element already has one or more attributes).*
  - *The attribute name followed by an equal sign.*
  - *The attribute value wrapped by opening and closing quotation marks.*

Nesting elements



HTML

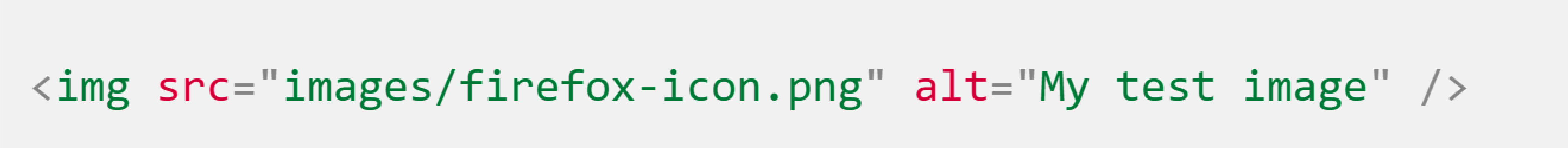
```html
<p>My cat is <strong>very</strong> grumpy.</p>
```



HTML

```html
<p>My cat is <strong>very grumpy.</p></strong>
```

Void elements



```
<img src="images/firefox-icon.png" alt="My test image" />
```

Comments

- Anything in HTML between <!-- and --> is an HTML comment.
- The browser ignores comments as it renders the code. In other words, they are not visible on the page - just in the code.
- <!-- this is a comment in HTML -->

What about < and > characters?

- < : &lt;
- > : &gt;
- &: &amp;
- More in: https://www.degraeve.com/reference/specialcharacters.php

Attributes

- Global attributes
- Tag specific attributes - some required / some optional
- Boolean Attributes

Attributes

- Boolean Attributes
- Example:
- using the disabled attribute prevents the end user from entering text into the input box:
  - *<input type="text" disabled="disabled" />*
  - *<input type="text" disabled />*
- text input is allowed, as it doesn't contain the disabled attribute
  - *<input type="text" />*

Attribute values

- Single quote / double quote / without quotes?
  - *<a href=https://www.mozilla.org/>favorite website</a> : ok*
  - *<a href=https://www.mozilla.org/ title=The Mozilla homepage>favorite website</a> : bad*

Attribute values

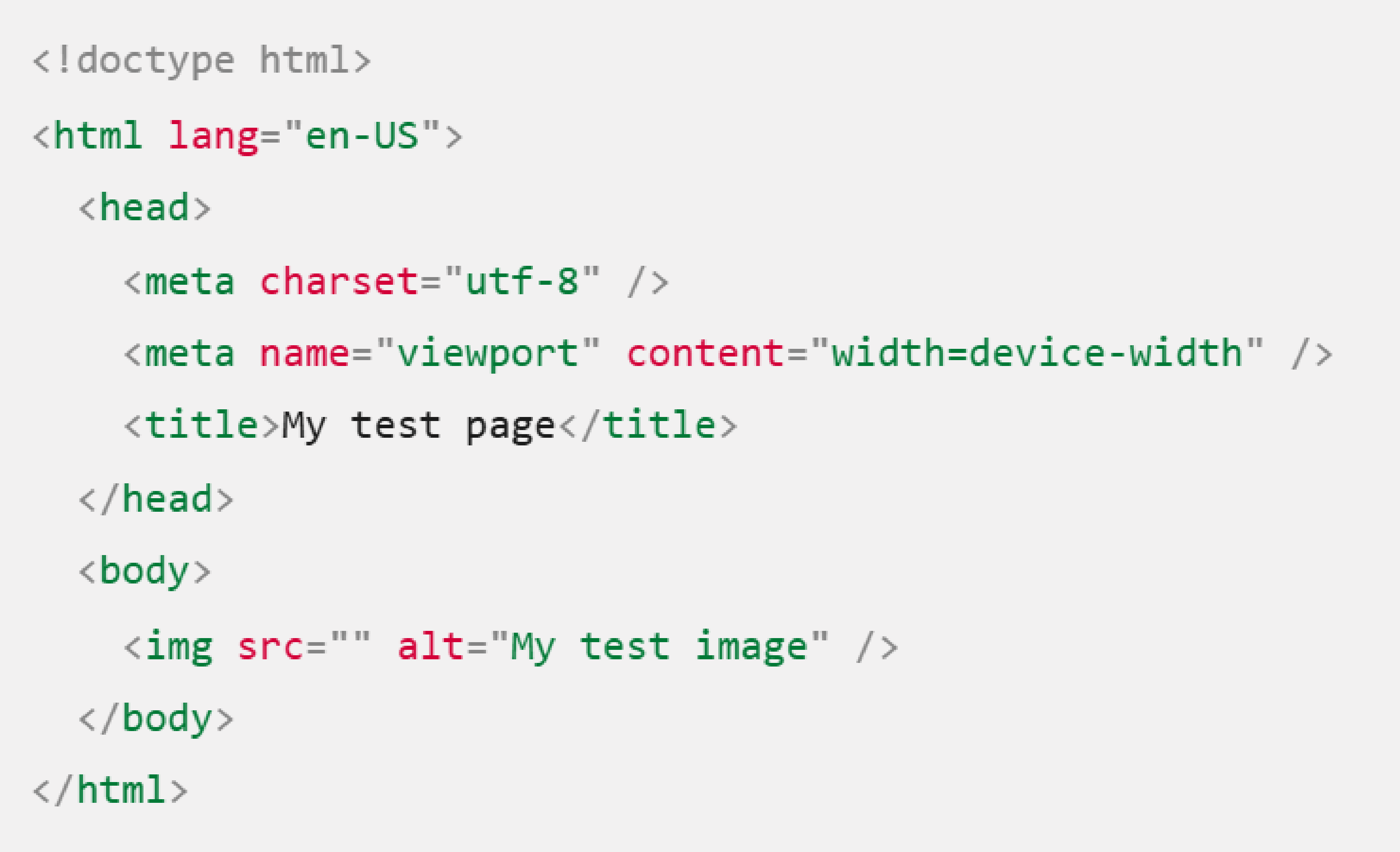
- Single quote / double quote / without quotes?

  - *<a href='https://www.example.com'>A link to my example.</a>: ok*
  - *<a href="https://www.example.com">A link to my example.</a>: ok*
  - *<a href="https://www.example.com'>A link to my example.</a>: bad*

What Tags we have?

- A good reference: https://www.w3schools.com/TAGs/ref_byfunc.asp

First HTML Document



```
<!doctype html>
<html lang="en-US">
  <head>
    <meta charset="utf-8" />
    <meta name="viewport" content="width=device-width" />
    <title>My test page</title>
  </head>
  <body>
    <img src="" alt="My test image" />
  </body>
</html>
```

First HTML Document

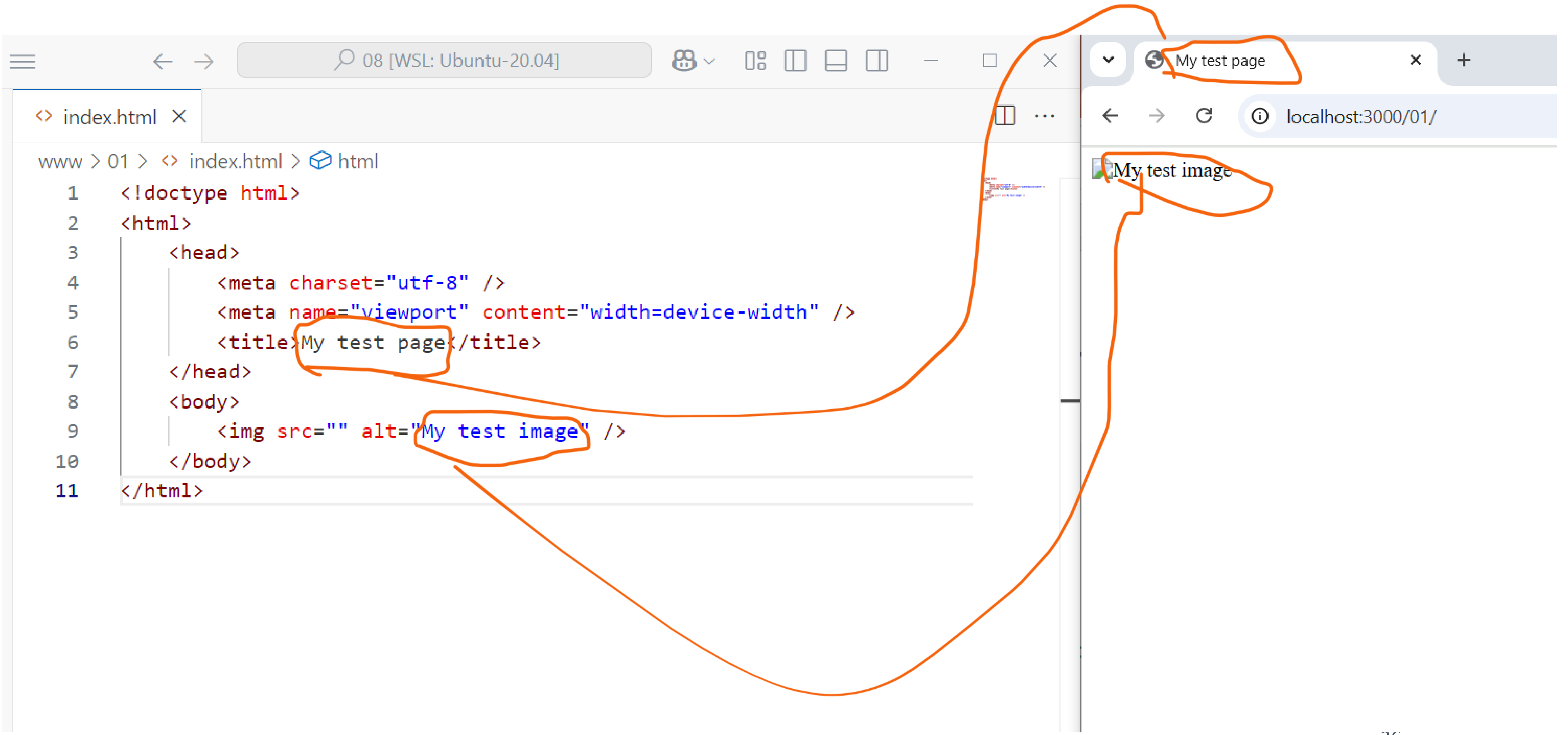
- <!doctype html>
  - *The doctype is a required preamble. In the mists of time, when HTML was young (around 1991/92), doctypes were meant to act as links to a set of rules that the HTML page had to follow to be considered good HTML, which could mean automatic error checking and other useful things. However, these days, they don't do much and are basically just needed to make sure your document behaves correctly. That's all you need to know for now.*
- <html></html>
  - *the <html> element. This element wraps all the content on the entire page and is sometimes known as the root element. It also includes the lang attribute, setting the primary language of the document.*

First HTML Document

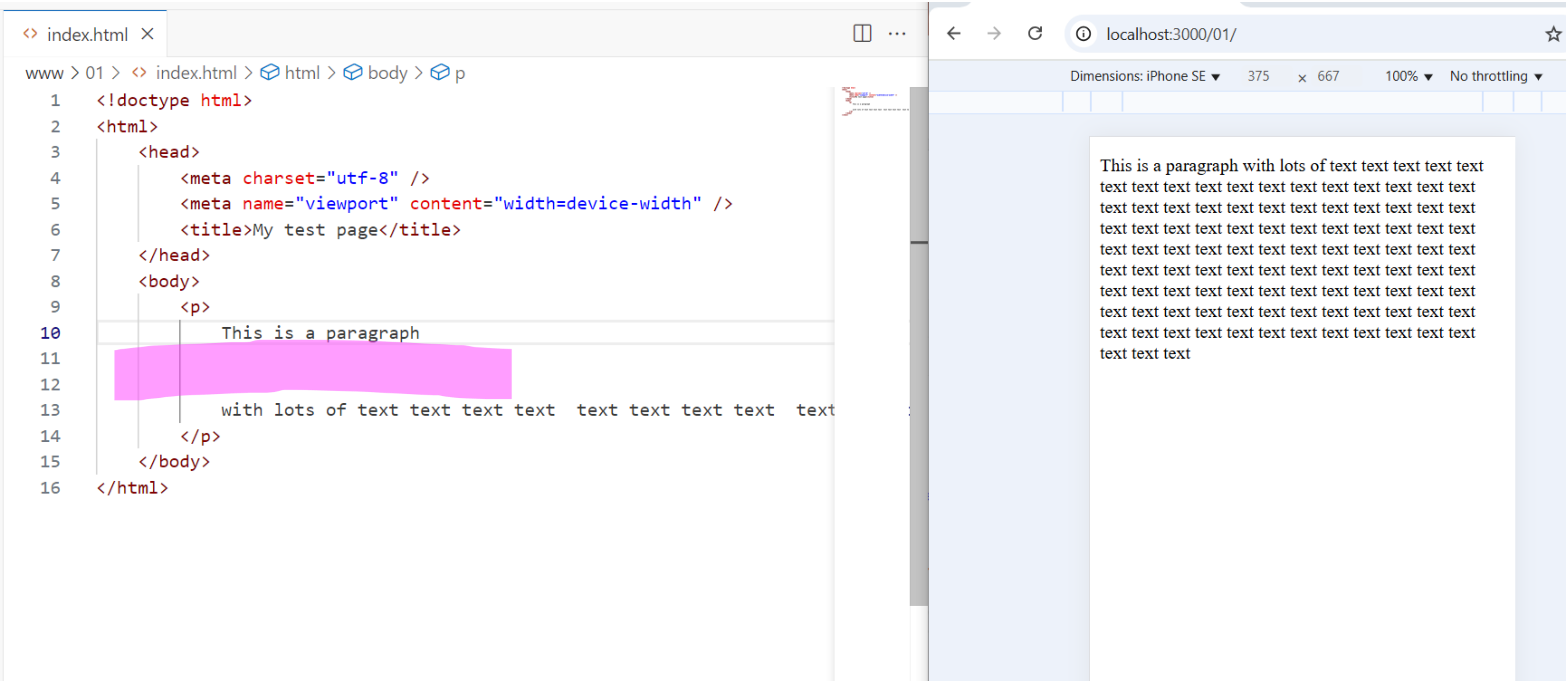
- <head></head>
  - *This element acts as a container for all the stuff you want to include on the HTML page that isn't the content you are showing to your page's viewers. This includes things like keywords and a page description that you want to appear in search results, CSS to style our content, character set declarations, and more.*
- <meta charset="utf-8">
  - *This element sets the character set your document should use to UTF-8 which includes most characters from the vast majority of written languages. Essentially, it can now handle any textual content you might put on it. There is no reason not to set this, and it can help avoid some problems later on.*

First HTML Document

- <meta name="viewport" content="width=device-width">
  - *This viewport element ensures the page renders at the width of viewport, preventing mobile browsers from rendering pages wider than the viewport and then shrinking them down.*
- <title></title>
  - *This sets the title of your page, which is the title that appears in the browser tab the page is loaded in. It is also used to describe the page when you bookmark/favorite it.*
- <body></body>
  - *This contains all the content that you want to show to web users when they visit your page, whether that's text, images, videos, games, playable audio tracks, or whatever else.*



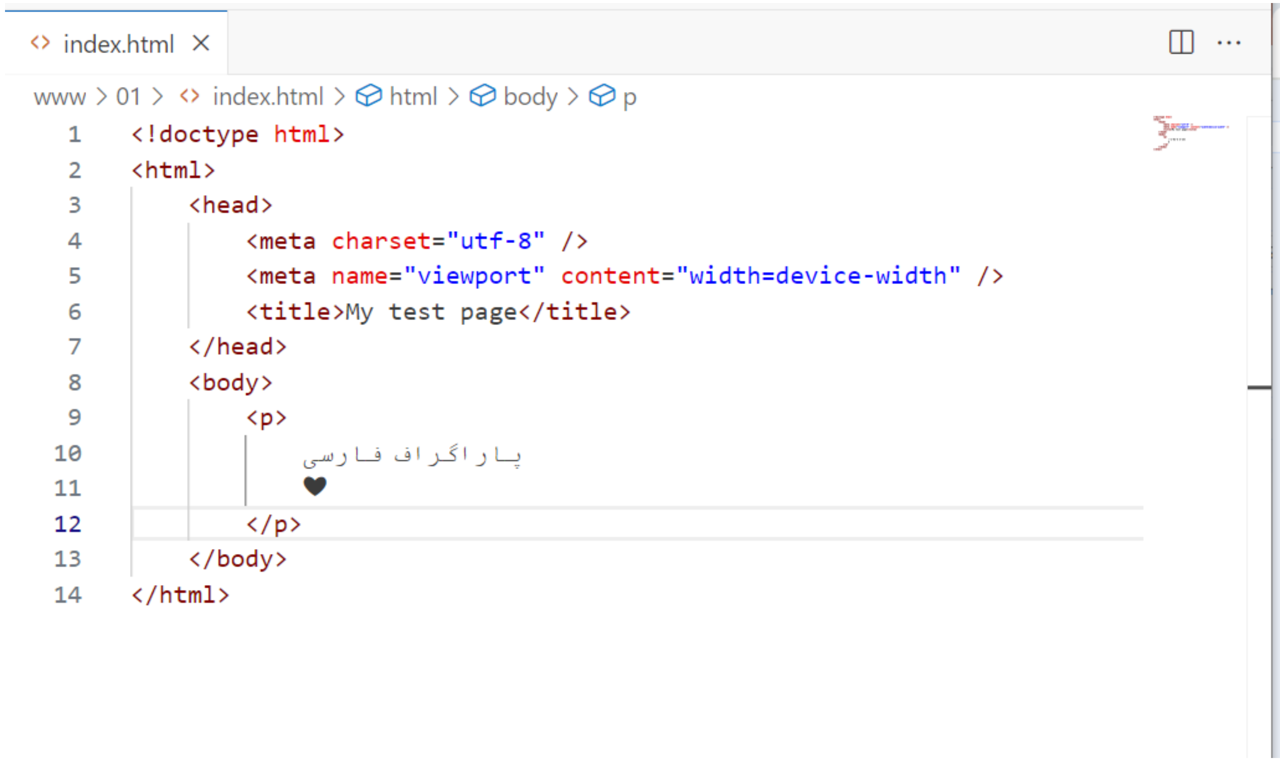
```html
<!doctype html>
<html>
    <head>
        <meta charset="utf-8" />
        <meta name="viewport" content="width=device-width" />
        <title>My test page</title>
    </head>
    <body>
        <img src="" alt="My test image" />
    </body>
</html>
```



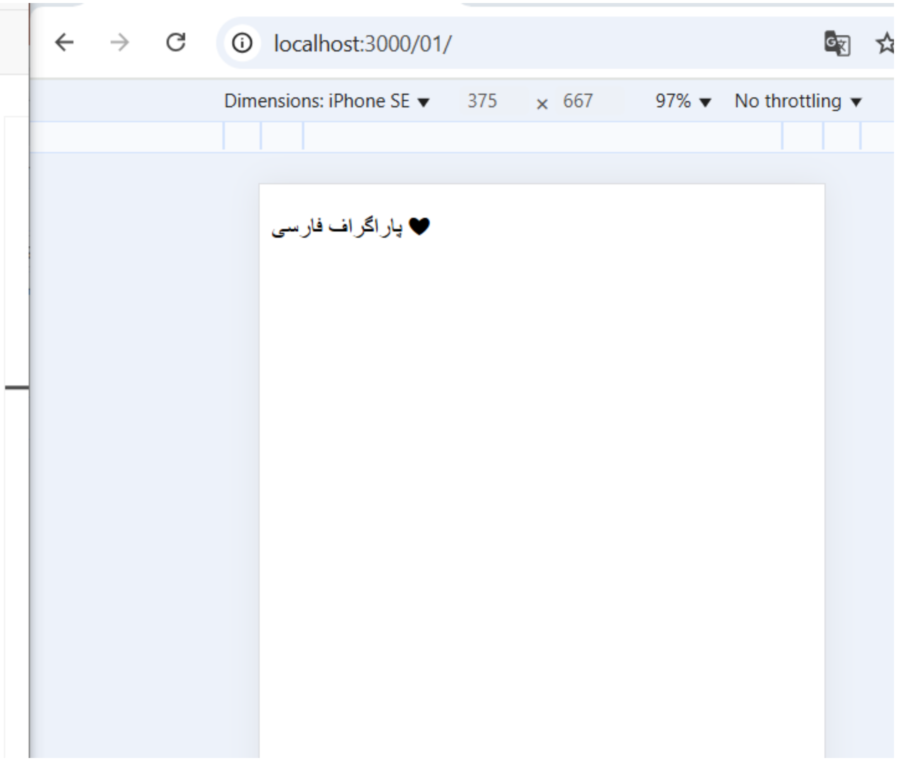
```
<!doctype html>
<html>
    <head>
        <meta charset="utf-8" />
        <meta name="viewport" content="width=device-width" />
        <title>My test page</title>
    </head>
    <body>
        <p>
            This is a paragraph


            with lots of text text text text  text text text text  text
        </p>
    </body>
</html>
```

Dimensions: iPhone SE ▾ 375 × 667 100% ▾ No throttling ▾

This is a paragraph with lots of text



```html
<!doctype html>
<html>
    <head>
        <meta charset="utf-8" />
        <meta name="viewport" content="width=device-width" />
        <title>My test page</title>
    </head>
    <body>
        <p>
            پاراگراف فارسی
            ❤
        </p>
    </body>
</html>
```



localhost:3000/01/

Dimensions: iPhone SE ▾ 375 × 667 97% ▾ No throttling ▾

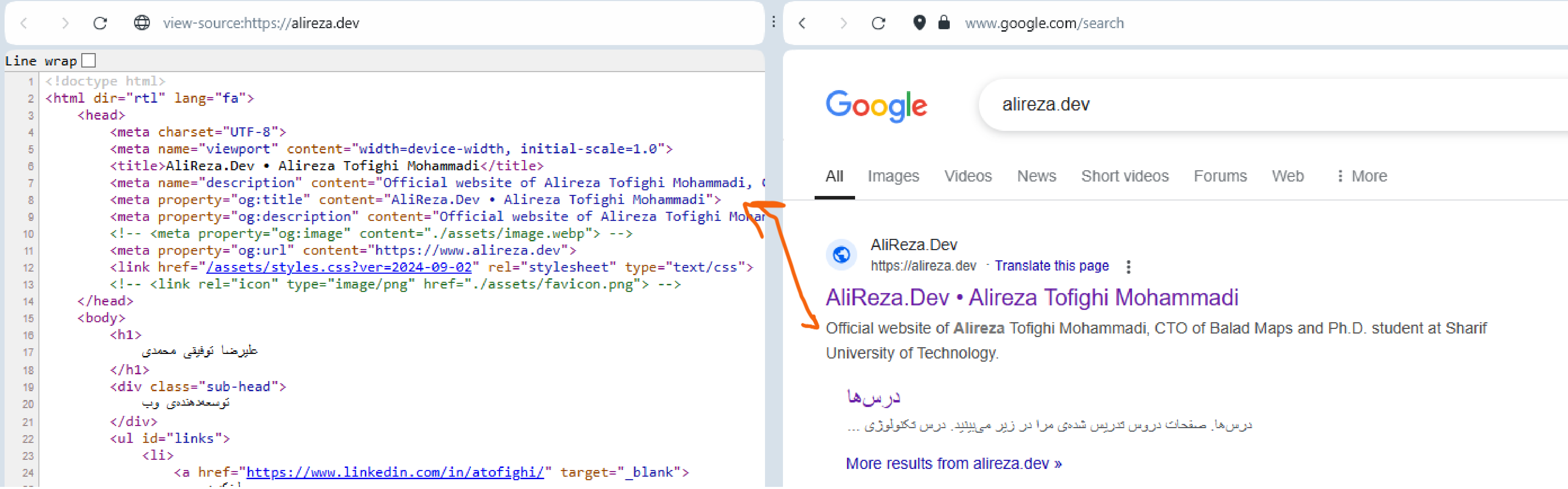
پاراگراف فارسی ❤

More meta tags

- <meta name="author" content="Chris Mills" />
  - *Specifying an author is beneficial in many ways: it is useful to be able to understand who wrote the page, if you have any questions about the content and you would like to contact them. Some content management systems have facilities to automatically extract page author information and make it available for such purposes.*

More meta tags

- <meta name="description" content=“A description that explains the page" />
  - *is useful as it has the potential to make your page appear higher in relevant searches performed in search engines (such activities are termed Search Engine Optimization, or SEO.)*



```html
<!doctype html>
<html dir="rtl" lang="fa">
    <head>
        <meta charset="UTF-8">
        <meta name="viewport" content="width=device-width, initial-scale=1.0">
        <title>AliReza.Dev • Alireza Tofighi Mohammadi</title>
        <meta name="description" content="Official website of Alireza Tofighi Mohammadi, 
        <meta property="og:title" content="AliReza.Dev • Alireza Tofighi Mohammadi">
        <meta property="og:description" content="Official website of Alireza Tofighi Moham
        <!-- <meta property="og:image" content="./assets/image.webp"> -->
        <meta property="og:url" content="https://www.alireza.dev">
        <link href="/assets/styles.css?ver=2024-09-02" rel="stylesheet" type="text/css">
        <!-- <link rel="icon" type="image/png" href="./assets/favicon.png"> -->
    </head>
    <body>
        <h1>
            علیرضا توفیقی محمدی
        </h1>
        <div class="sub-head">
            توسعه‌دهنده‌ی وب
        </div>
        <ul id="links">
            <li>
                <a href="https://www.linkedin.com/in/atofighi/" target="_blank">
```

AliReza.Dev
https://alireza.dev · Translate this page

AliReza.Dev • Alireza Tofighi Mohammadi

Official website of **Alireza** Tofighi Mohammadi, CTO of Balad Maps and Ph.D. student at Sharif University of Technology.

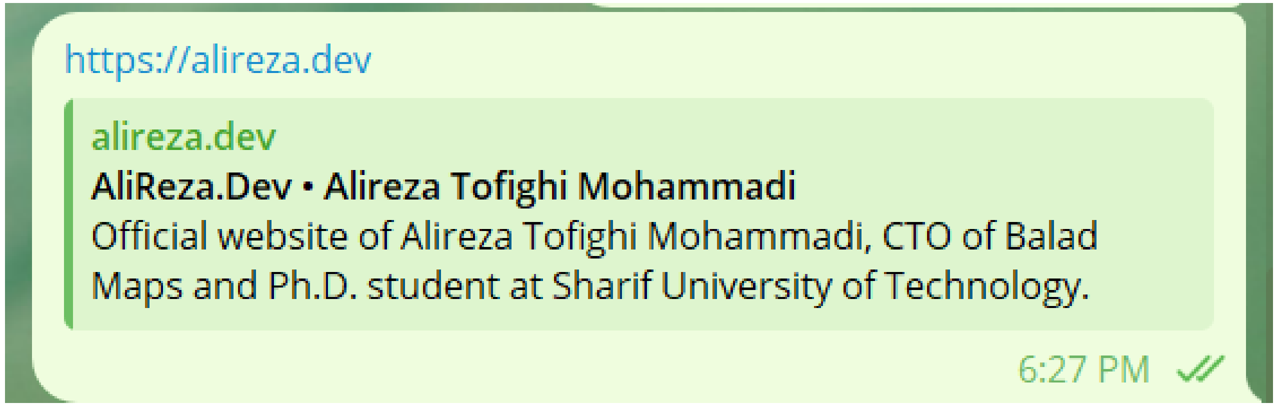
درس‌ها

درس‌ها. صفحات دروس تدریس شده‌ی مرا در زیر می‌بینید. درس تکنولوژی ...

More results from alireza.dev »

More meta tags

- Open Graph meta tags:
  - *https://ogp.me*



https://alireza.dev

alireza.dev

AliReza.Dev • Alireza Tofighi Mohammadi

Official website of Alireza Tofighi Mohammadi, CTO of Balad Maps and Ph.D. student at Sharif University of Technology.

6:27 PM

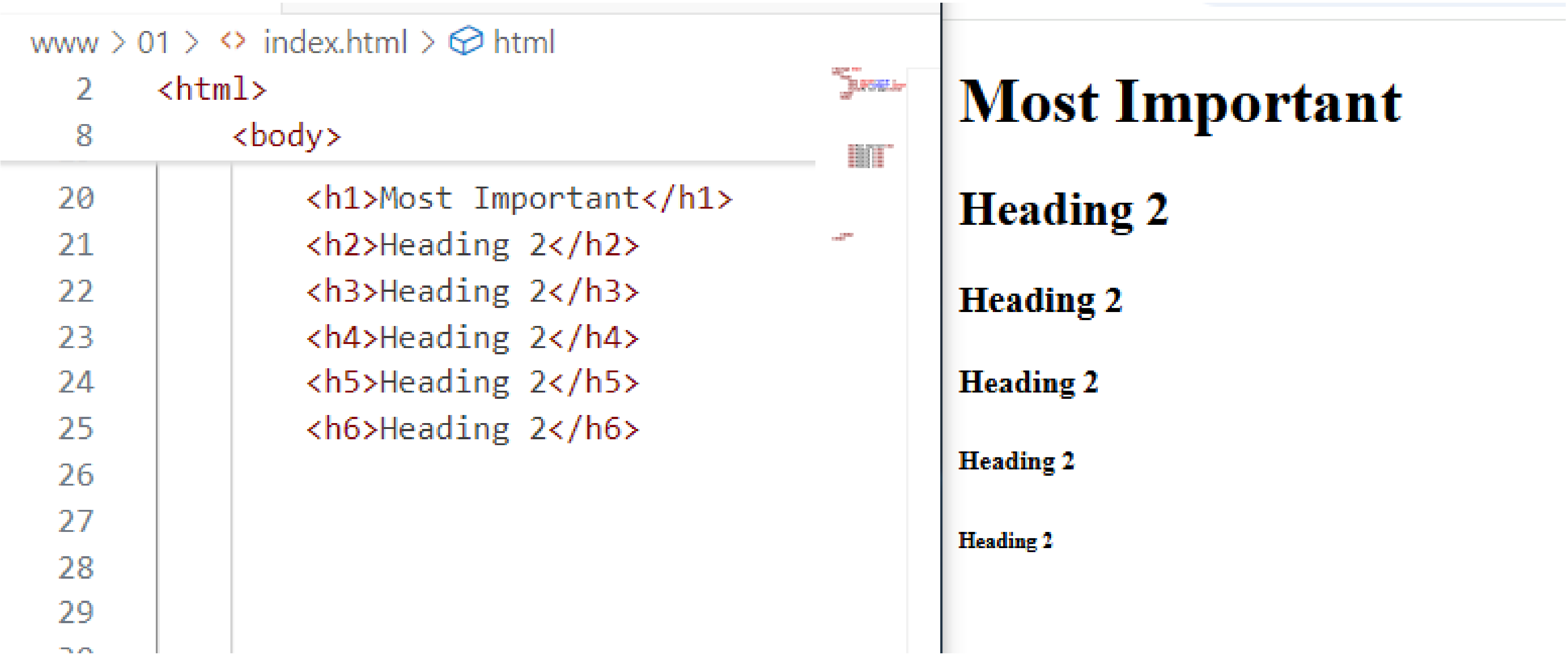
Link tags

- The <link> HTML element specifies relationships between the current document and an external resource.
  - *<link rel="icon" href="favicon.ico" />*

- More info: https://developer.mozilla.org/en-US/docs/Web/HTML/Element/link

HTML Headings

- H1
- H2
- H3
- H4
- H5
- h6



```
<html>
    <body>
        <h1>Most Important</h1>
        <h2>Heading 2</h2>
        <h3>Heading 2</h3>
        <h4>Heading 2</h4>
        <h5>Heading 2</h5>
        <h6>Heading 2</h6>
```

Most Important

Heading 2

Heading 2

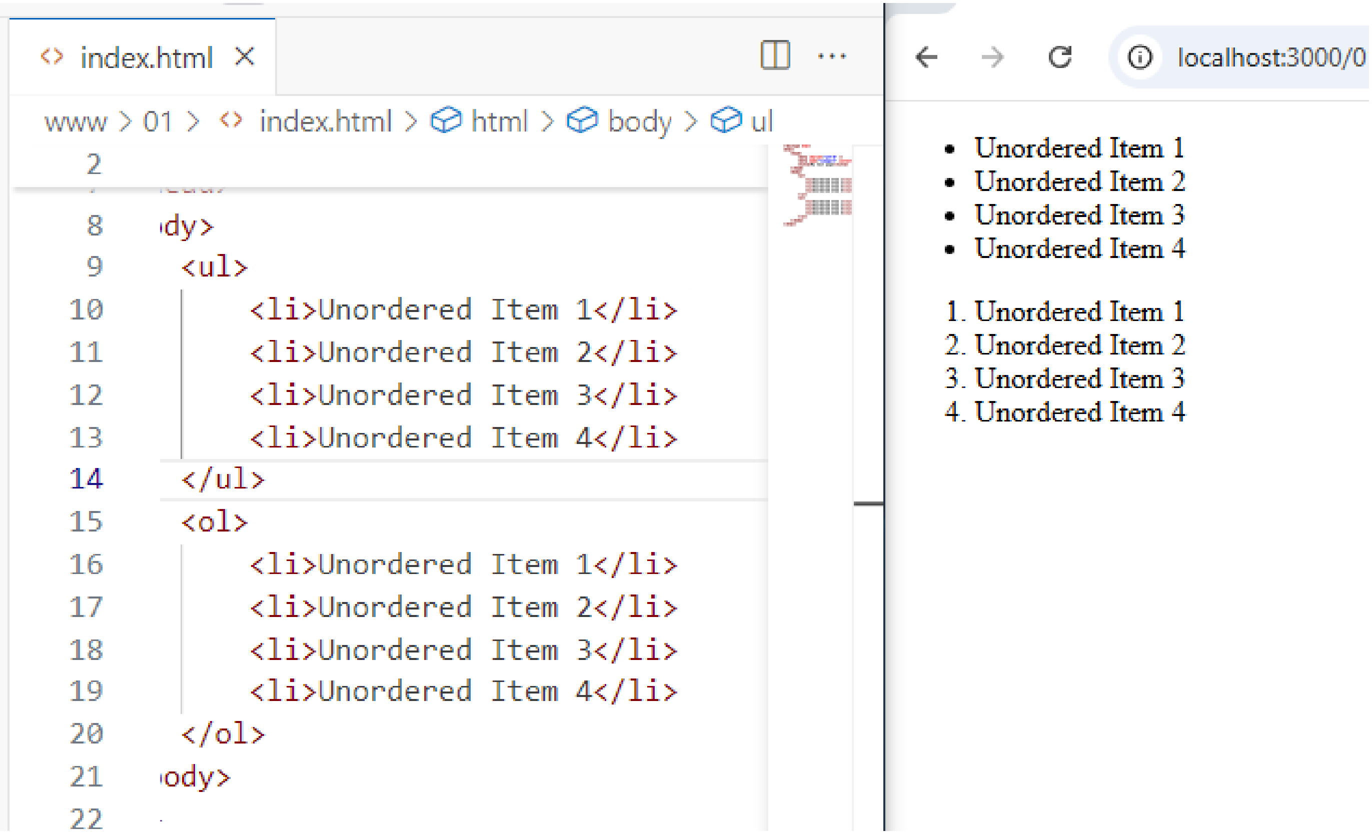
Heading 2

Heading 2

Heading 2

Lists

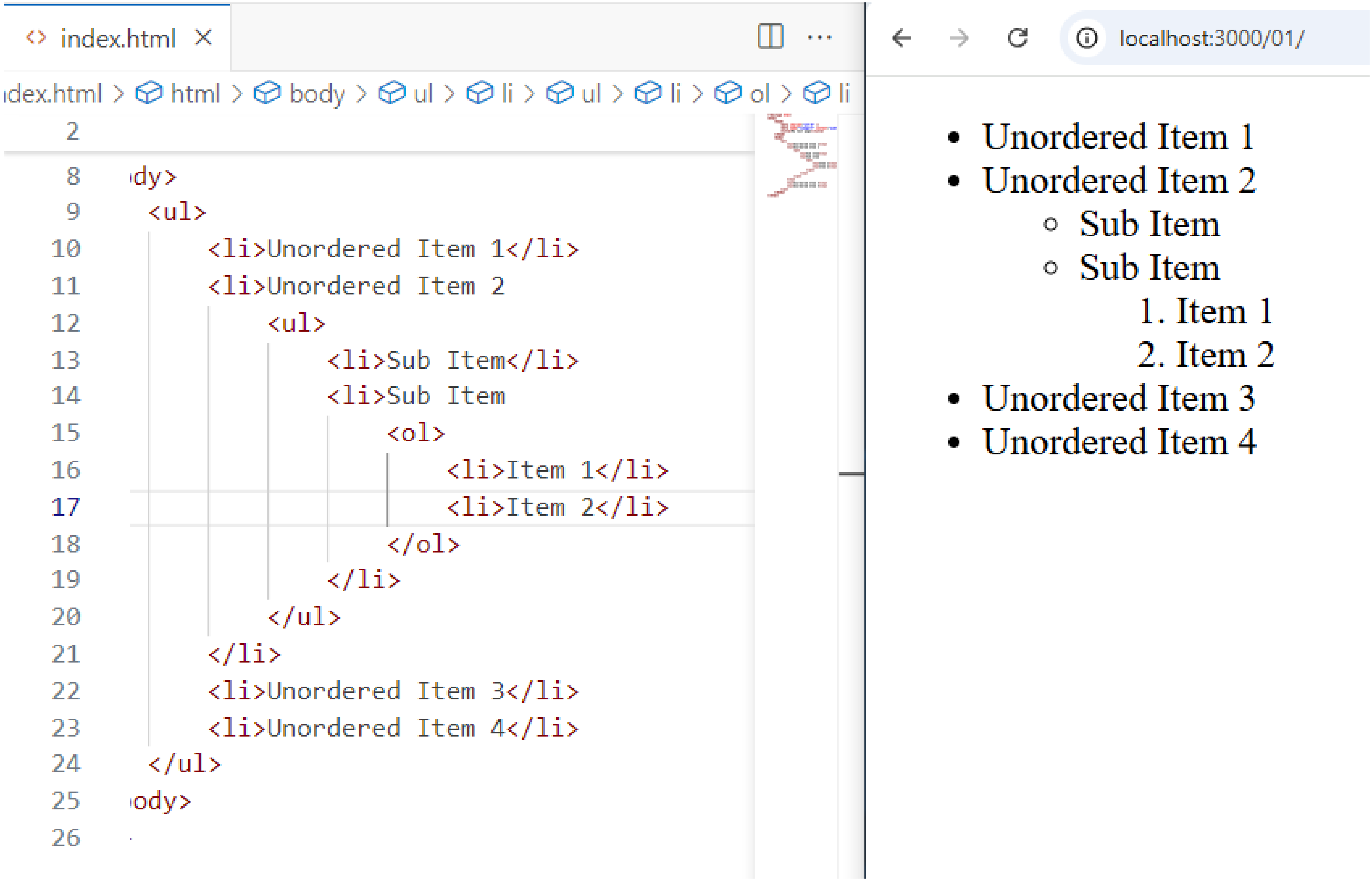
- ul: unordered list
- ol: ordered list
- li:list item



```
dy>
 <ul>
     <li>Unordered Item 1</li>
     <li>Unordered Item 2</li>
     <li>Unordered Item 3</li>
     <li>Unordered Item 4</li>
 </ul>
 <ol>
     <li>Unordered Item 1</li>
     <li>Unordered Item 2</li>
     <li>Unordered Item 3</li>
     <li>Unordered Item 4</li>
 </ol>
ody>
```

```
•  Unordered Item 1
•  Unordered Item 2
•  Unordered Item 3
•  Unordered Item 4

1. Unordered Item 1
2. Unordered Item 2
3. Unordered Item 3
4. Unordered Item 4
```

Lists - nested



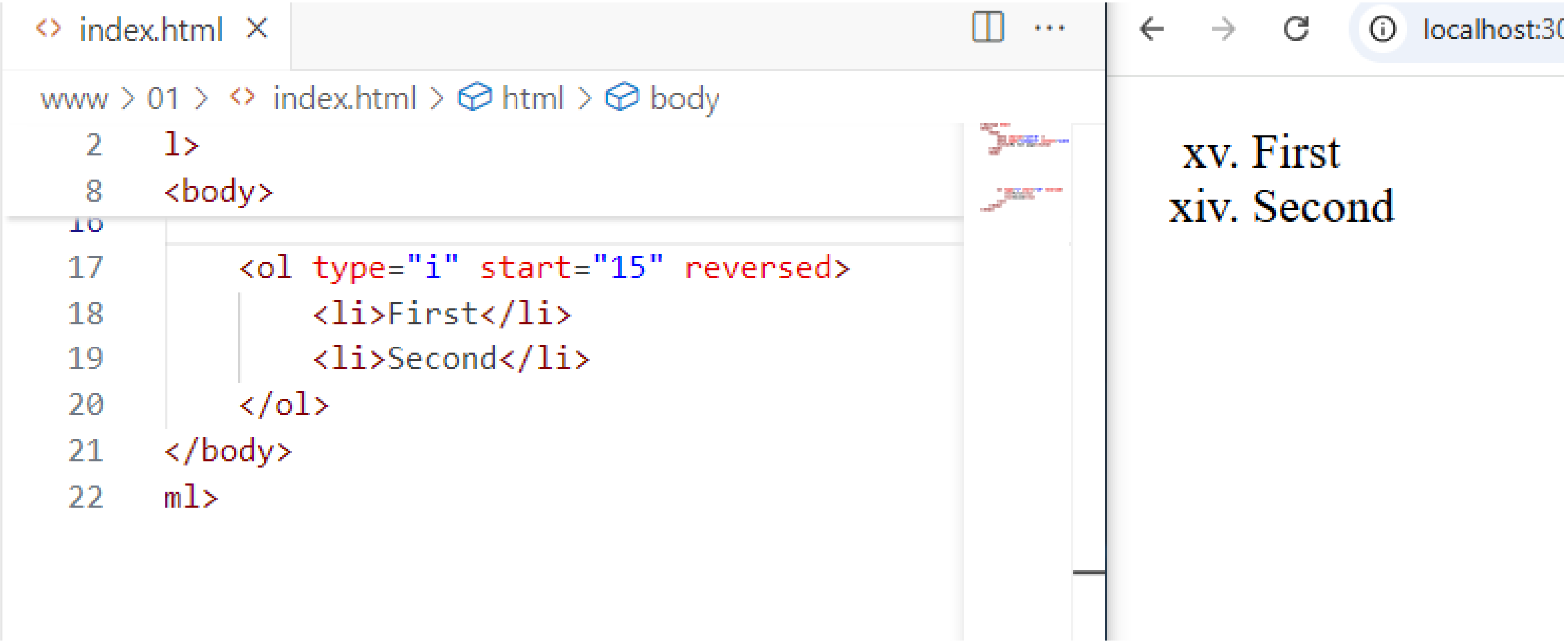
```
dy>
  <ul>
      <li>Unordered Item 1</li>
      <li>Unordered Item 2
          <ul>
              <li>Sub Item</li>
              <li>Sub Item
                  <ol>
                      <li>Item 1</li>
                      <li>Item 2</li>
                  </ol>
              </li>
          </ul>
      </li>
      <li>Unordered Item 3</li>
      <li>Unordered Item 4</li>
  </ul>
ody>
```

- Unordered Item 1
- Unordered Item 2
    - Sub Item
    - Sub Item
        1. Item 1
        2. Item 2
- Unordered Item 3
- Unordered Item 4

OL - Attributes

Attribute	Value	Description
reversed	reversed	Specifies that the list order should be reversed (9,8,7...)
start	*number*	Specifies the start value of an ordered list
type	1 A a I i	Specifies the kind of marker to use in the list

OL - Attributes

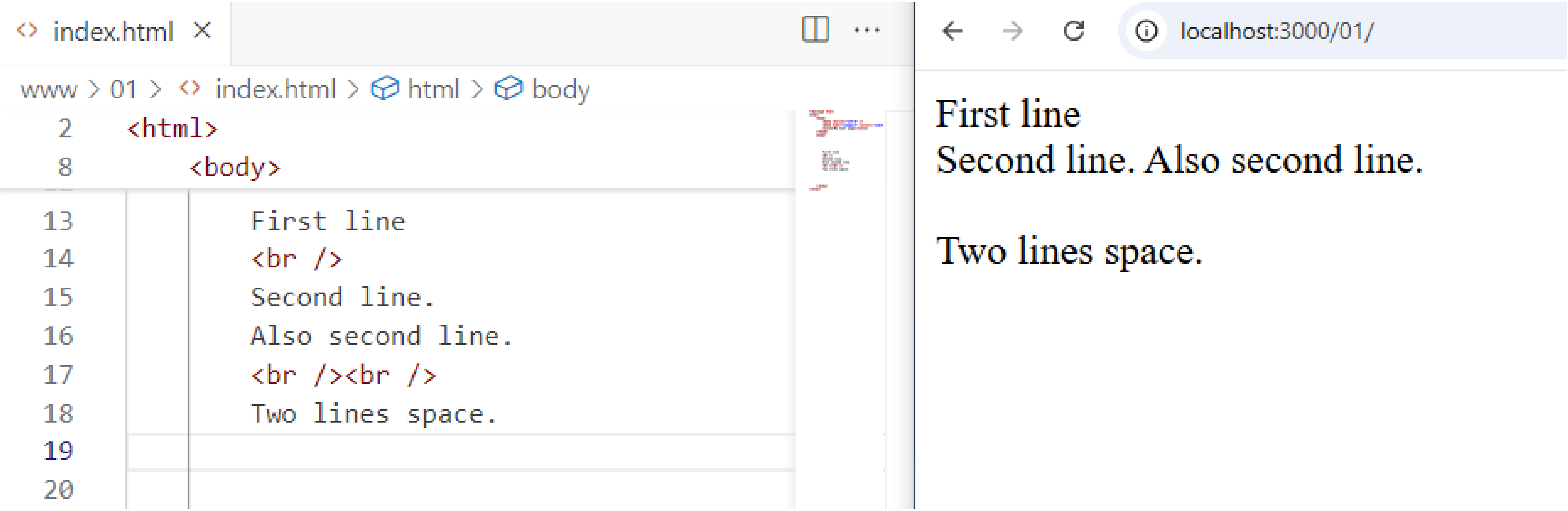


```
l>
<body>

    <ol type="i" start="15" reversed>
        <li>First</li>
        <li>Second</li>
    </ol>
</body>
ml>
```

```
 xv. First
xiv. Second
```

New line

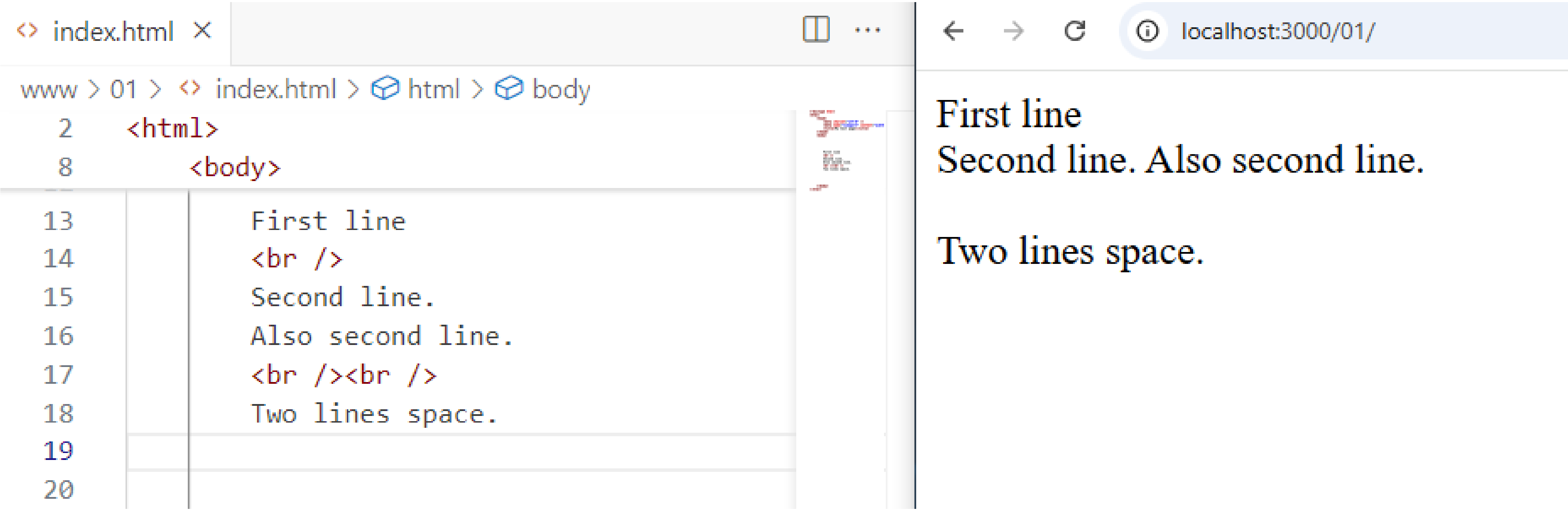
- br
- hr



```
<html>
    <body>

        First line
        <br />
        Second line.
        Also second line.
        <br /><br />
        Two lines space.


```

```
First line
Second line. Also second line.

Two lines space.
```

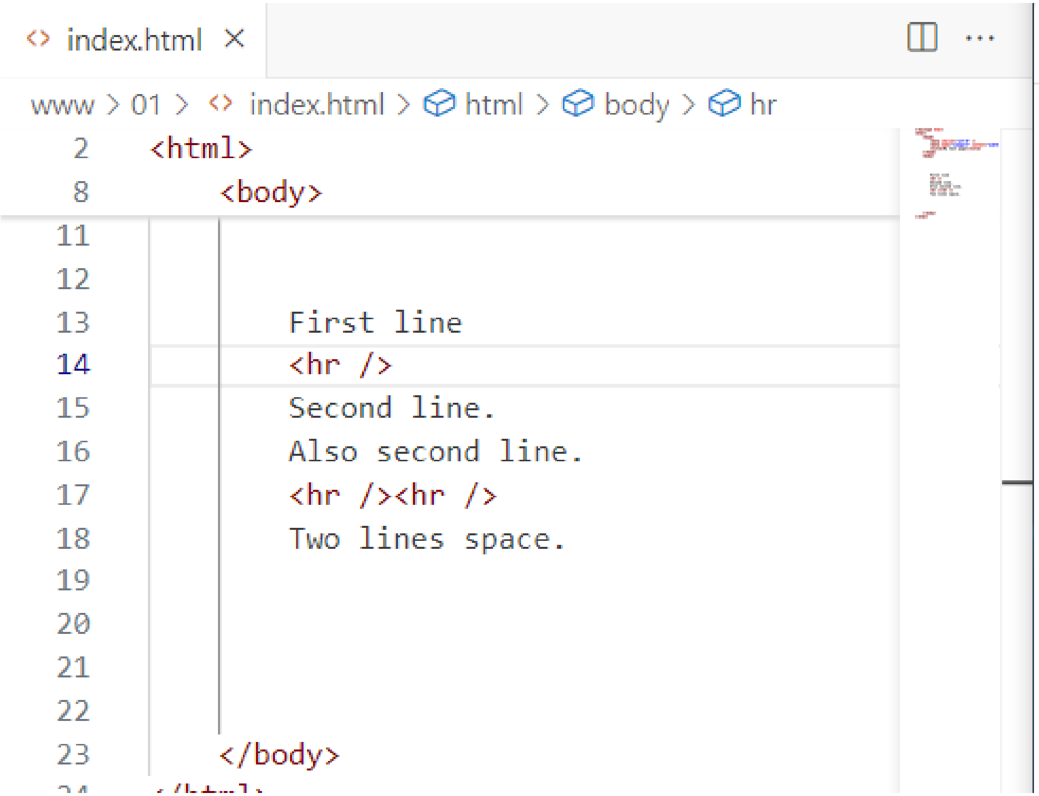
BR



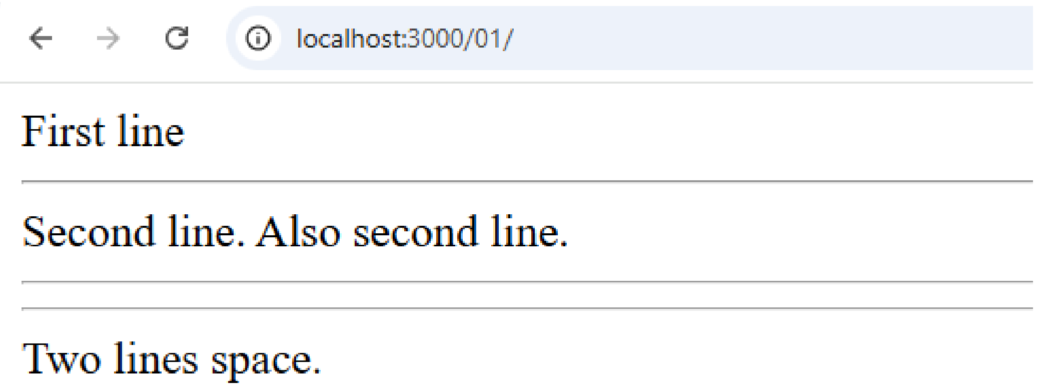
```
<html>
    <body>
            First line
            <br />
            Second line.
            Also second line.
            <br /><br />
            Two lines space.
```

```
First line
Second line. Also second line.

Two lines space.
```

HR



```
<html>
    <body>


        First line
        <hr />
        Second line.
        Also second line.
        <hr /><hr />
        Two lines space.




    </body>
</html>
```



First line

Second line. Also second line.

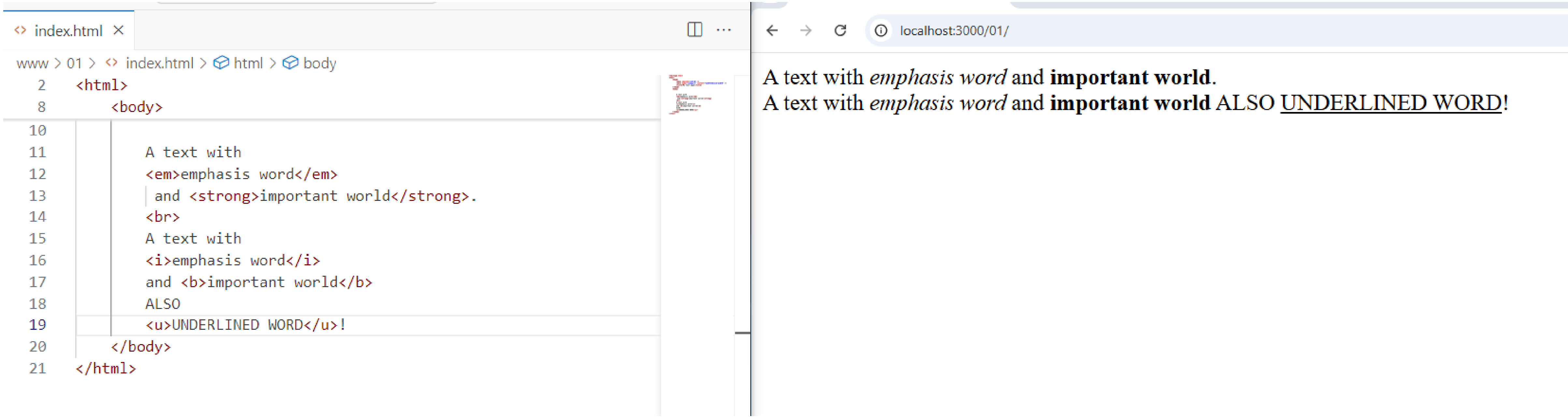
Two lines space.

Emphasis and importance

- em: emphasis (make text italic)
- strong: show important (make text bold)

But we have also presentation tags:

- b:bold
- i: italic
- u: underlined



```html
<html>
    <body>

        A text with
        <em>emphasis word</em>
         and <strong>important world</strong>.
        <br>
        A text with
        <i>emphasis word</i>
        and <b>important world</b>
        ALSO
        <u>UNDERLINED WORD</u>!
    </body>
</html>
```

A text with *emphasis word* and **important world**.
A text with *emphasis word* and **important world** ALSO UNDERLINED WORD!

Links

- a tag
- Attributes
  - *href*
    - Relative
      - *From root*
    - Absolute
    - Email links
  - *title*
  - *target="_blank"*

Images

```html
<img
  src="images/dinosaur.jpg"
  alt="The head and torso of a dinosaur skeleton;
          it has a large head with long sharp teeth"
  width="400"
  height="341"
  title="A T-Rex on display in the Manchester University Museum" />
```

Global Attributes

- Class, Style
- Id
- Title
- Dir: ltr|rtl|auto
- Lang: en|fa|…
- Tabindex: number

Tables

- table
- tr
- td, th
- Colspan and rowspan attributes

Forms

- Form
  - *Action*
  - *method*
- Button
- Input
  - *Name*
  - *Value*
  - *Id*
  - *type*
    - text
    - password
    - button
    - submit

Structural tags

- Some tags like header, footer, article, section, nav to describe the structure of page
- https://developer.mozilla.org/en-US/docs/Learn_web_development/Core/Structuring_content/Structuring_documents

CSS

Styling

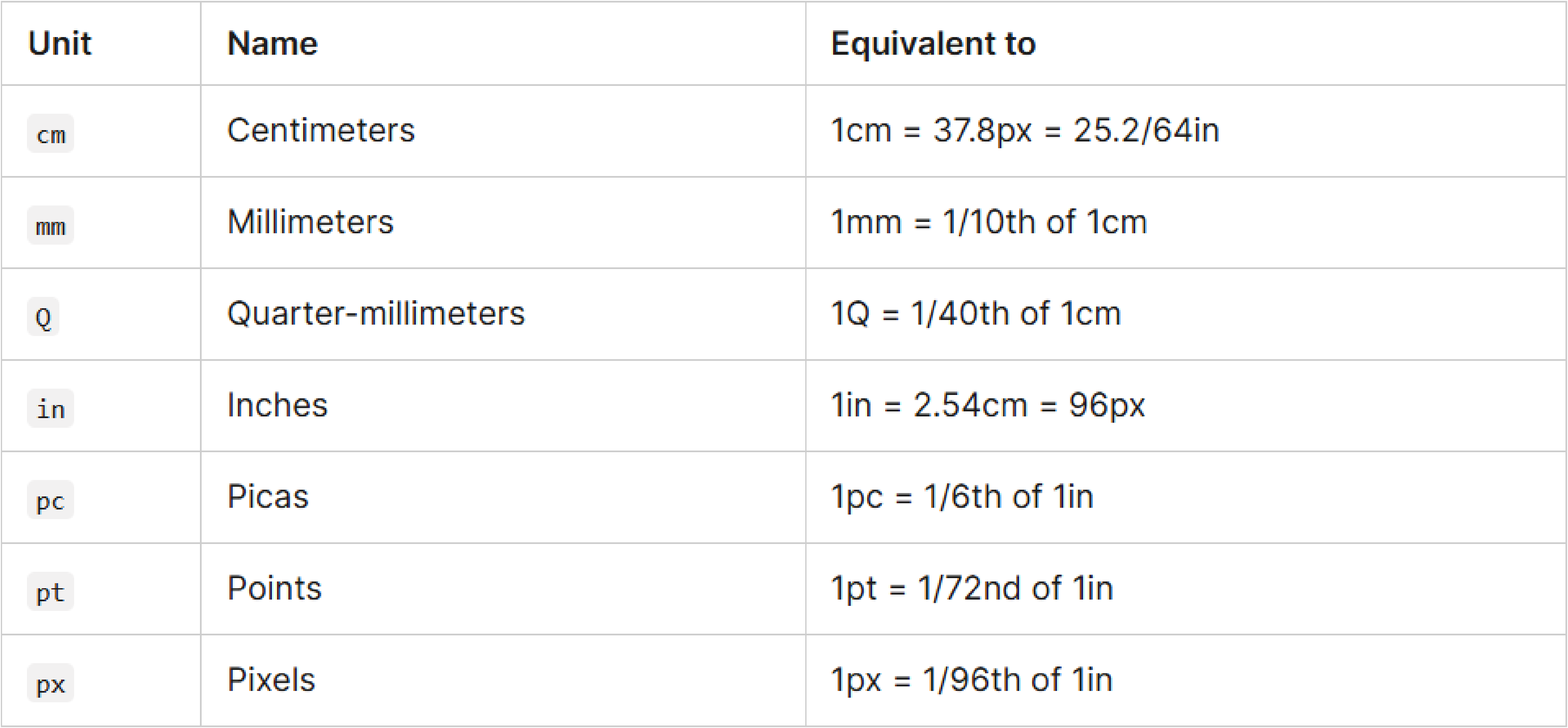
- style-name: style-value
- separated with ;
- font-size:30px;color:red

Styling

- html style attribute: inline styling
- Styling with css selector

CSS Text Styling

CSS Length Units



Unit	Name	Equivalent to
`cm`	Centimeters	1cm = 37.8px = 25.2/64in
`mm`	Millimeters	1mm = 1/10th of 1cm
`Q`	Quarter-millimeters	1Q = 1/40th of 1cm
`in`	Inches	1in = 2.54cm = 96px
`pc`	Picas	1pc = 1/6th of 1in
`pt`	Points	1pt = 1/72nd of 1in
`px`	Pixels	1px = 1/96th of 1in

CSS Length Units

- Relative:
  - *%*
  - *em is relative to the font size of this element, or the font size of the parent element when used for font-size. rem is relative to the font size of the root element.*
  - *vh and vw are relative to the viewport's height and width, respectively.*

CSS Selectors

- Type selector
- Class selector
- ID Selector
- Type and class selector
- Multiple selectors with comma
- Universal selector *

CSS Selectors

- Descendant combinator (space)
  - *The descendant combinator — typically represented by a single space (" ") character — combines two selectors such that elements matched by the second selector are selected if they have an ancestor (parent, parent's parent, parent's parent's parent, etc.) element matching the first selector. Selectors that utilize a descendant combinator are called descendant selectors.*

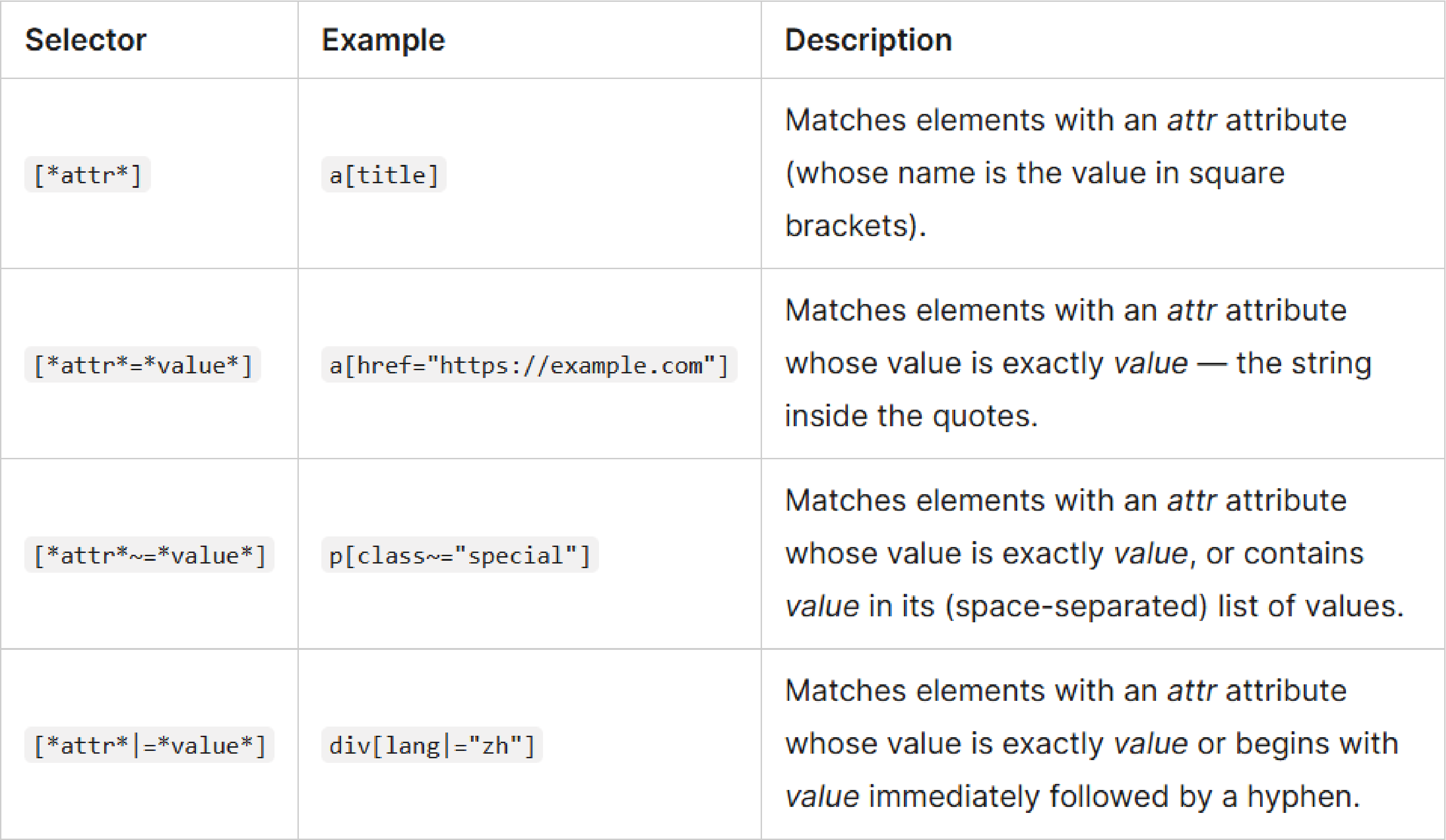
CSS Selectors

- Child combinator >
  - *The child combinator (>) is placed between two CSS selectors. It matches only those elements matched by the second selector that are the direct children of elements matched by the first.*

CSS Selectors

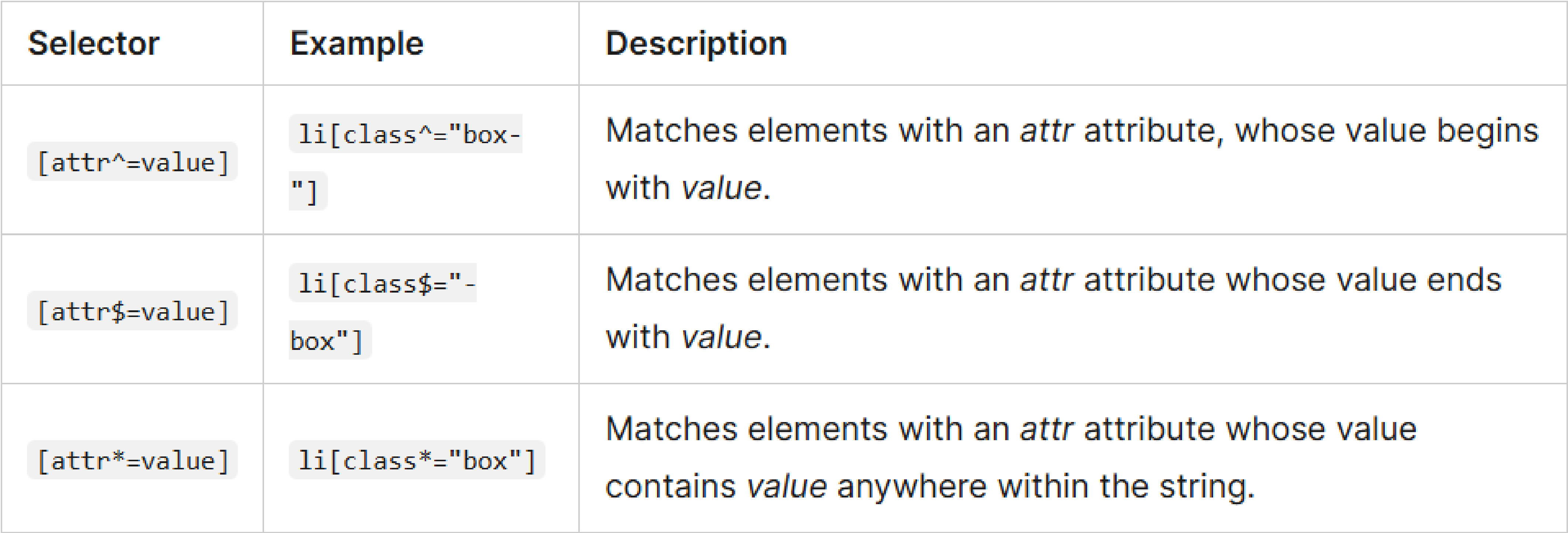
- Next-sibling combinator +
  - *The next-sibling combinator (+) separates two selectors and matches the second element only if it immediately follows the first element, and both are children of the same parent element.*
- Subsequent-sibling combinator ~
  - *The subsequent-sibling combinator (~, a tilde) separates two selectors and matches all instances of the second element that follow the first element (not necessarily immediately) and share the same parent element.*

CSS Attribute Selectors



Selector	Example	Description
`[*attr*]`	`a[title]`	Matches elements with an *attr* attribute (whose name is the value in square brackets).
`[*attr*=*value*]`	`a[href="https://example.com"]`	Matches elements with an *attr* attribute whose value is exactly *value* — the string inside the quotes.
`[*attr*~=*value*]`	`p[class~="special"]`	Matches elements with an *attr* attribute whose value is exactly *value*, or contains *value* in its (space-separated) list of values.
`[*attr*|=*value*]`	`div[lang|="zh"]`	Matches elements with an *attr* attribute whose value is exactly *value* or begins with *value* immediately followed by a hyphen.

CSS Attribute Selectors



Selector	Example	Description
`[attr^=value]`	`li[class^="box-"]`	Matches elements with an *attr* attribute, whose value begins with *value*.
`[attr$=value]`	`li[class$="-box"]`	Matches elements with an *attr* attribute whose value ends with *value*.
`[attr*=value]`	`li[class*="box"]`	Matches elements with an *attr* attribute whose value contains *value* anywhere within the string.

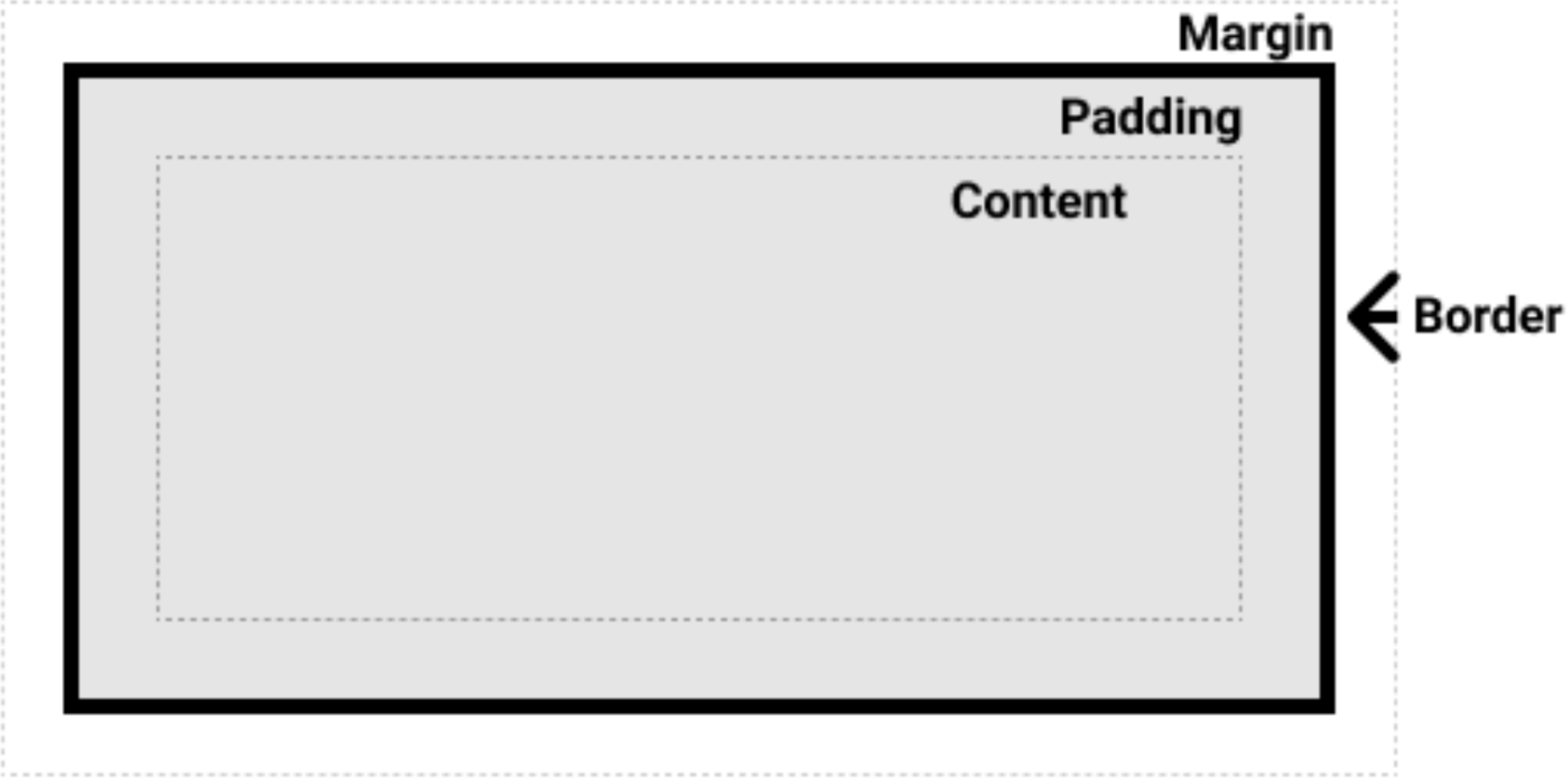
CSS Box Model

- Inner and block boxes

CSS Box Model

- Div and span tags

CSS Box Model



Handling Conflicts

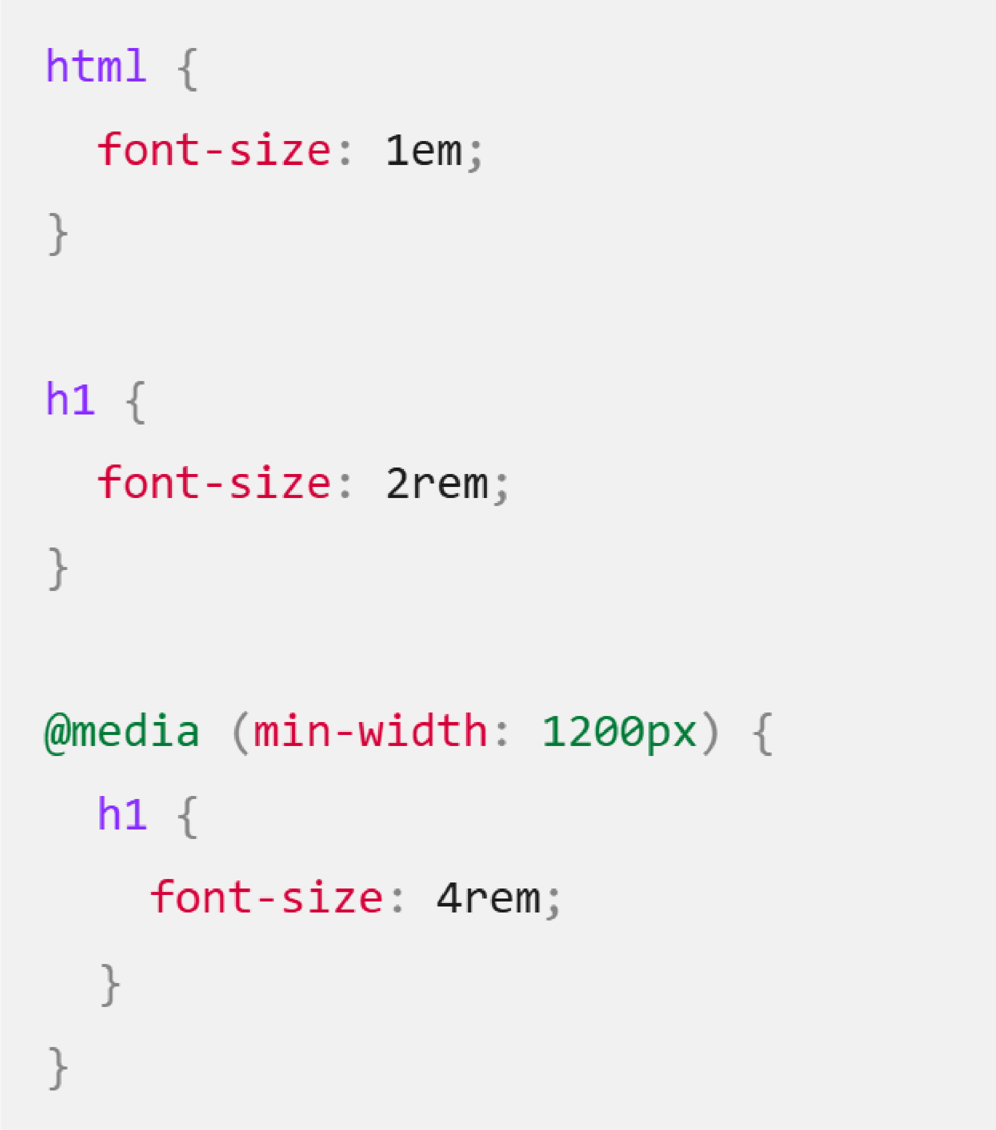
- More in: https://developer.mozilla.org/en-US/docs/Learn_web_development/Core/Styling_basics/Handling_conflicts

CSS Layout

- Float: https://developer.mozilla.org/en-US/docs/Learn_web_development/Core/CSS_layout/Floats
- Position: https://developer.mozilla.org/en-US/docs/Learn_web_development/Core/CSS_layout/Positioning
- Flexbox: https://developer.mozilla.org/en-US/docs/Learn_web_development/Core/CSS_layout/Flexbox
- Grid layout: https://developer.mozilla.org/en-US/docs/Learn_web_development/Core/CSS_layout/Grids

Responsive Web Design

- Media queries:



```css
html {
  font-size: 1em;
}

h1 {
  font-size: 2rem;
}

@media (min-width: 1200px) {
  h1 {
    font-size: 4rem;
  }
}
```