

Web Programming

CSS Part II.

Part II

Selectors

Recap

selector `p` {
 `font-family: Arial;`
 `color: blue;`
 `text-align: right;`
}

declaration

- **Selectors** indicate which element(s) the rule applies to
- **Declarations** describe the styling
 - List of property: value pairs separated by a semicolon

Element selector

- Using single element as a selector:

```
body {  
    background-color: #f0f8ff;  
}
```

- Multiple elements can be listed by commas.
 - The individual elements can also have their own styles (like **p** below)

```
h1, h2, h3, p {  
    font-family: Verdana, Arial, sans-serif;  
}  
p {  
    margin: 1em;  
    padding: 0.5em;  
}
```

Exercise #1 (#1b)



[github.com/dat310-2022/info/tree/main/
exercises/css/selectors](https://github.com/dat310-2022/info/tree/main/exercises/css/selectors)

IDs and classes

- **ID** specifies a single unique element
 - HTML: **id** attribute with a unique value
 - CSS: id value prefixed by #

HTML `<p id="firstpar">...</p>`

CSS `#firstpar {...}`

- **Class** can be assigned to a number of elements.
- An element can have multiple classes assigned to it.
 - HTML: **class** attribute with one or more values separated by space
 - CSS: class value prefixed by .

HTML `<p class="red">...</p>`
`<p class="red justified">...</p>`

CSS `.red {...}`
`.justified {...}`

Selectors so far

element {
h1, h2, h3, p {
font-family: Verdana, Arial, sans-serif;
}
p {
width: 500px;
border: 1px solid black;
margin: 1em;
padding: 0.5em;
}
}
ID {
#firstpar {
font-weight: bold;
}
}
class {
.red {
color: red;
}
.justified {
text-align: justify;
}
}

ID selector vs. inline CSS

- With the ID selector inline CSS can be avoided
- That also means that it is possible from now on to move all style sheets to an external CSS file
- Best practice: **avoid inline CSS**
 - style sheets provide more maintainability
 - better separation of HTML data/structure and style/layout

Exercise #2



[github.com/dat310-2022/info/tree/main/](https://github.com/dat310-2022/info/tree/main/exercises/css/selectors)
exercises/css/selectors

Exercise #3



[github.com/dat310-2022/info/tree/main/](https://github.com/dat310-2022/info/tree/main/exercises/css/selectors)
exercises/css/selectors

Selectors

	Selector	Meaning	Example
★	Universal	Matches all elements in the document	* {} All elements on the page
★	Type	Matches element name	h1, h2, h3 {} <h1>, <h2>, <h3> elements
★	Class	Matches element class	.note {} Any elements whose class attribute has a value of note p.note {} Only <p> elements whose class attribute has a value of note
★	ID	Matches element ID	#introduction {} Element with an id attribute that has the value introduction

Elements tree

```
<table border="1">
  <thead>
    <tr>
      <th>First name</th>
      <th>Last name</th>
      <th>Points</th>
    </tr>
  </thead>
  <tbody>
    <tr>
      <td>John</td>
      <td>Smith</td>
      <td>100</td>
    </tr>
    [...]
  </tbody>
</table>
```

Child: td elements are Childs of the tr element.

Siblings: td elements in same row are siblings.

Descendant: all td and tr elements are descendants of table

Selectors (2)

Selectors combinators



Descendant	Element that is descendent of another (not just direct child)	p a {} Any <a> inside an <p> (even if there are other elements nested in between them)
Child	Element that is a direct child of another	li>a {} Any <a> elements that are children of an element
Adjacent sibling	Element that is the next sibling of another	h1+p {} First <p> element after any <h1> element (but not other <p> elements)
General sibling	Element that is a sibling of another, but does not have to be directly preceding	h1~p {} If there are two <p> elements that are siblings of an <h1> element, this applies to both

Example: adjacent vs. general sibling

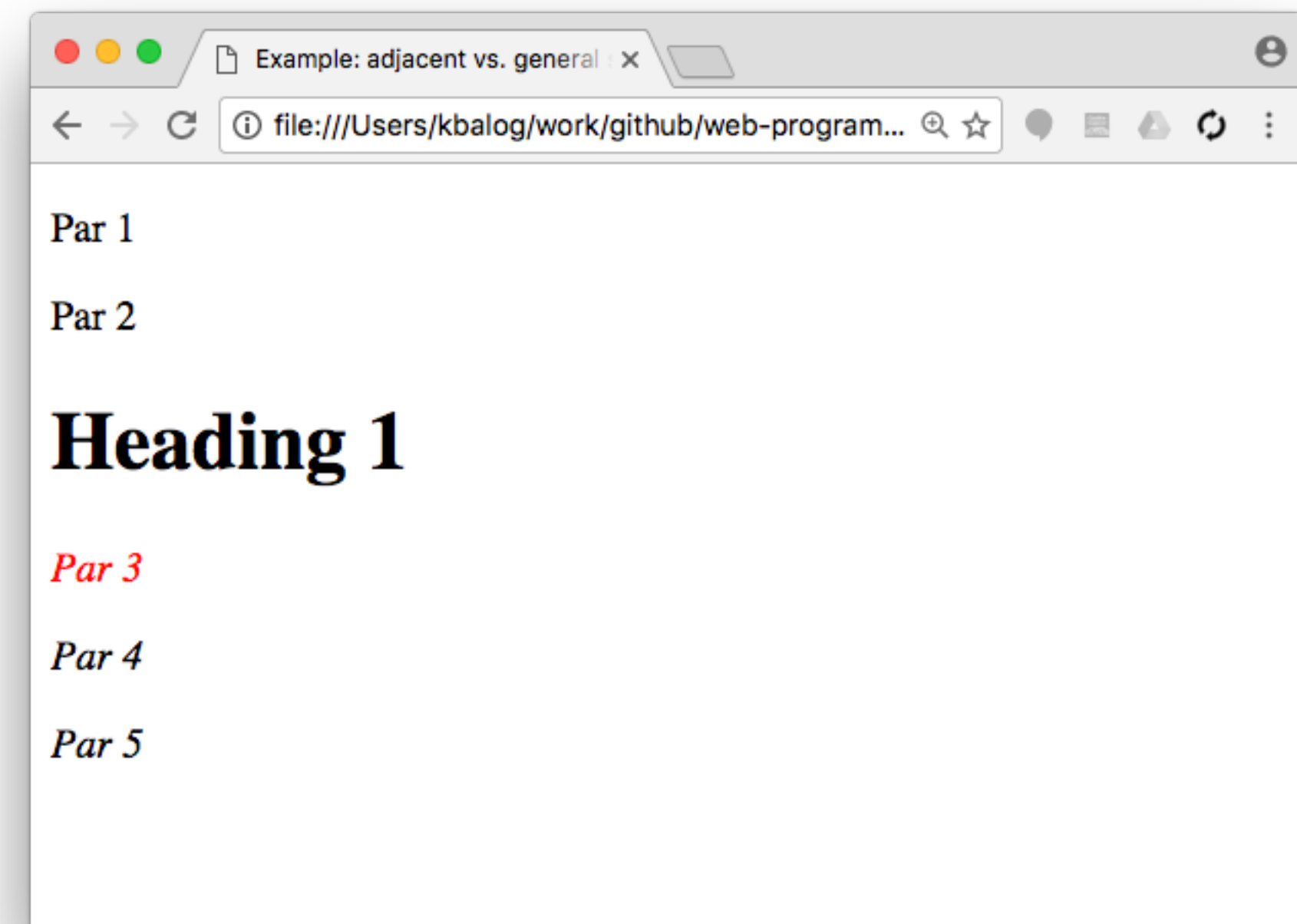
🐙 [examples/css/selectors/siblings.html](https://github.com/kbalog/web-programming-examples/blob/main/css/selectors/siblings.html)

CSS

```
h1 + p {  
  color: red;  
}  
  
h1 ~ p {  
  font-style: italic;  
}
```

HTML

```
<p>Par 1</p>  
<p>Par 2</p>  
<h1>Heading 1</h1>  
<p>Par 3</p>  
<p>Par 4</p>  
<p>Par 5</p>
```



Selectors (3)



Attribute selector	Element that has a specific attribute	p[title] {} Any <p> elements that have a title attribute
Pseudo-classes	Add special effects to some selectors, which are applied automatically in certain states	a:visited {} Any visited link
Pseudo-elements	Assign style to content that does not exist in the source document	p::first-line {} First line inside a <p> element

Question

- What's the difference?

```
.intro a {...}
```

a element inside an
element that have the
intro class

```
a.intro {...}
```

only **a** elements that
have the **intro** class

Question

- What's the difference?

```
#header.callout {...}
```

element that has ID
header as well as
class **callout**

```
#header .callout {...}
```

all elements with the class
name **callout** that are
descendants of the element
with ID **header**

Exercise #4



[github.com/dat310-2022/info/tree/main/](https://github.com/dat310-2022/info/tree/main/exercises/css/selectors)
exercises/css/selectors

List properties

- Shape of list item markers
 - Property: **list-style-type**
 - Values for unordered lists:
 - **circle, square, ...**
 - Values for ordered lists:
 - **upper-roman, lower-alpha, ...**
- Remove list markers
 - **list-style-type: none**
- Using an image as the list item marker
 - **list-style-image: url('filename.png')**

CSS Priority Scheme

- This is the “cascading” part...
 - Many properties might affect the same element
 - Some of these might conflict with each other
 - Cascading decides which to apply

CSS priority scheme

#	CSS source type	Description
1	User defined	User-defined CSS in the browser
2	Inline	HTML element's style property
3	Media type	Media-specific CSS
4	Importance	!important overwrites previous types
5	Selector specificity	More specific selector over generic ones
6	Rule order	Last rule of declaration
7	Parent inheritance	Not specified is inherited from parent
8	CSS definition	Any CSS definition
9	Browser default	Initial values

CSS priority scheme

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Inheritance

- Some properties are **inherited** by child elements
 - Font-family, color, etc.
- Others are **not inherited** by child elements
 - Background-color, border, etc.
- Inheritance can be forced using **inherit**

```
body {...}
.page {
  background-color: #efefef;
  padding: inherit;
}
```

CSS priority scheme

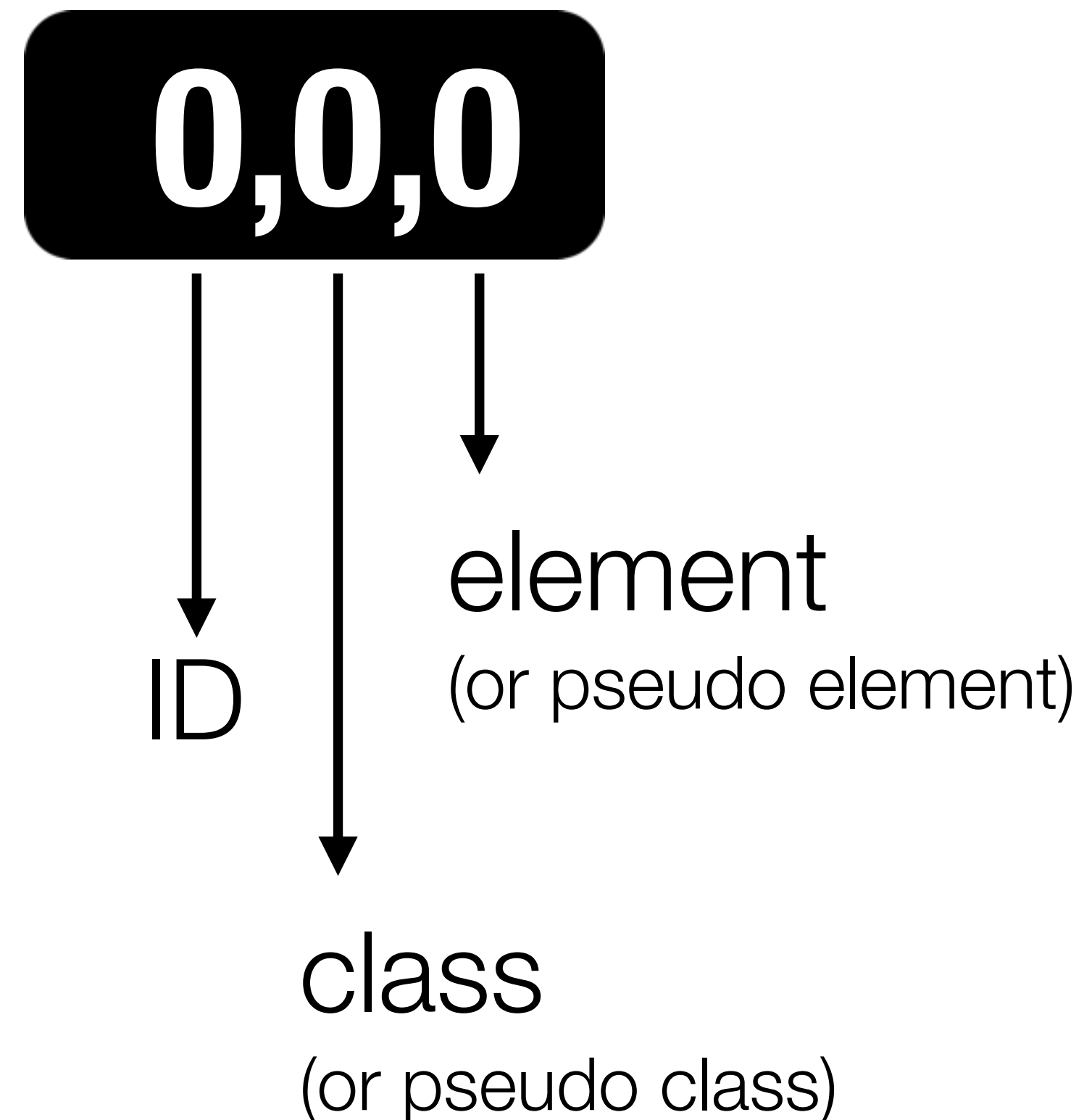
#	CSS source type	Description
1	User defined	User-defined CSS in the browser
2	Inline	HTML element's style property
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8	CSS definition	Any CSS definition
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Specificity hierarchy

- If multiple selectors apply to the same element, the one with **higher specificity** wins
- Every selector has its place in the *specificity hierarchy*
 1. IDs
#div
 2. Classes, attributes, pseudo-classes
.classes, [attributes], :hover
 3. Elements (types) and pseudo-elements
p, :after

Computing specificity

- Think in a number system (with a large base)



Computing specificity

- Think in a number system (with a large base)

body #content .data img:hover

1,2,2

↓
ID

#content

↓
element **body img**
(or pseudo element)

↓
class **.data :hover**
(or pseudo class)

Specificity wars

- http://www.stuffandnonsense.co.uk/archives/css_specificity_wars.html



Vader

1,0,0

ID



Maul

0,1,0

class



Storm trooper

0,0,1

element



a

1 x element selector

Sith power: 0,0,1



p a

2 x element selectors

Sith power: 0,0,2



.foo

1 x class selector *

Sith power: 0,1,0



a.foo

1 x element selector
1 x class selector

Sith power: 0,1,1



p a.foo

2 x element selectors
1 x class selector

Sith power: 0,1,2



.foo .bar

2 x class selectors

Sith power: 0,2,0



p.foo a.bar

2 x element selectors
2 x class selectors

Sith power: 0,2,2



#foo

1 x id selector

Sith power: 1,0,0



a#foo

1 x element selector
1 x id selector

Sith power: 1,0,1



.foo a#bar

1 x element selector
1 x class selector
1 x id selector

Sith power: 1,1,1



.foo .foo #foo

2 x class selectors
1 x id selector

Sith power: 1,2,0



style

1 x style attribute

Sith power: 1,0,0,0

Exercise #5



[github.com/dat310-2022/info/tree/main/
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Online specificity calculator

<http://specificity.keegan.st>

Specificity Calculator

A visual way to understand [CSS specificity](#). Change the selectors or paste in your own.

li:first-child h2 .title

0

Inline styles

0

IDs

2

Classes, attributes
and pseudo-classes

2

Elements and
pseudo-elements

+ Duplicate

Quiz

- The answer is the color of the text after CSS is applied
 - I.e., the HTML part is always the same

```
<div id="main" class="container">  
  <p id="foo" class="bar boo">Something clever goes here</p>  
</div>
```


Keep in mind

- The color property is **inherited** by child elements
- However, any style declaration (even with the lowest specificity) overwrites the inherited value
- Specificity is to be computed only when there are multiple declarations that apply to the same element

#1

```
HTML <div id="main" class="container">  
      <p id="foo" class="bar boo">Something clever goes here</p>  
    </div>
```

```
CSS body {color: red;}  
    p {color: blue;}
```

- The answer is the color of the text after CSS is applied

- ☐ red
- ☐ blue
- ☐ black

#1 Solution

```
HTML <div id="main" class="container">  
      <p id="foo" class="bar boo">Something clever goes here</p>  
    </div>
```

```
CSS body {color: red;}  
    p {color: blue;}
```

- The answer is the color of the text after CSS is applied

- ☐ red
- ☒ blue
- ☐ black

Explanation:

The red color is inherited from body. The explicit style declaration for the p element overwrites it.

#2

```
HTML <div id="main" class="container">  
      <p id="foo" class="bar boo">Something clever goes here</p>  
    </div>
```

```
CSS p.bar {color: red;}  
    p.boo {color: blue;}
```

- The answer is the color of the text after CSS is applied

- ☐ red
- ☐ blue
- ☐ black

#2 Solution

HTML `<div id="main" class="container">
 <p id="foo" class="bar boo">Something clever goes here</p>
</div>`

CSS `p.bar {color: red;}
p.boo {color: blue;}`

- The answer is the color of the text after CSS is applied

- ☐ red
- ☒ blue
- ☐ black

Explanation:

p.bar and p.boo have the same specificity. The last rule of declaration decides.

#3

HTML

```
<div id="main" class="container">  
  <p id="foo" class="bar boo">Something clever goes here</p>  
</div>
```

CSS

```
p {color: red;}  
.container {color: blue;}
```

- The answer is the color of the text after CSS is applied

- ☐ red
- ☐ blue
- ☐ black

#3 Solution

HTML `<div id="main" class="container">
 <p id="foo" class="bar boo">Something clever goes here</p>
</div>`

CSS `p {color: red;}
.container {color: blue;}`

- The answer is the color of the text after CSS is applied

- ☒ red
- ☐ blue
- ☐ black

Explanation:

The blue color is inherited from div.container.
The explicit style declaration for the p element overwrites it.

#4

HTML `<div id="main" class="container">
 <p id="foo" class="bar boo">Something clever goes here</p>
</div>`

CSS `#main {color: red;}
body .container {color: blue;}`

- The answer is the color of the text after CSS is applied

- ☐ red
- ☐ blue
- ☐ black

#4 Solution

HTML `<div id="main" class="container">
 <p id="foo" class="bar boo">Something clever goes here</p>
</div>`

CSS `#main {color: red;}
body .container {color: blue;}`

- The answer is the color of the text after CSS is applied

- ☒ red
- ☐ blue
- ☐ black

Explanation:

The color is inherited from the parent div. For that div, the ID #main has a higher specificity (1-0-0) than "body .container" (0-1-1).

#5

HTML

```
<div id="main" class="container">  
  <p id="foo" class="bar boo">Something clever goes here</p>  
</div>
```

CSS

```
#foo {color: red;}  
#main {color: blue;}
```

- The answer is the color of the text after CSS is applied

- ☐ red
- ☐ blue
- ☐ black

#5 Solution

```
HTML <div id="main" class="container">  
      <p id="foo" class="bar boo">Something clever goes here</p>  
    </div>
```

```
CSS #foo {color: red;}  
    #main {color: blue;}
```

- The answer is the color of the text after CSS is applied

- ☒ red
☐ blue
☐ black

Explanation:

The color inherited from the parent div (blue) is overwritten by the declaration for the ID #foo.

#6

```
HTML <div id="main" class="container">  
      <p id="foo" class="bar boo">Something clever goes here</p>  
    </div>
```

```
CSS .container p {color: red;}  
div .boo {color: blue;}
```

- The answer is the color of the text after CSS is applied

- ☐ red
- ☐ blue
- ☐ black

#6 Solution

```
HTML <div id="main" class="container">  
      <p id="foo" class="bar boo">Something clever goes here</p>  
    </div>
```

```
CSS .container p {color: red;}  
div .boo {color: blue;}
```

- The answer is the color of the text after CSS is applied

- ☐ red
- ☒ blue
- ☐ black

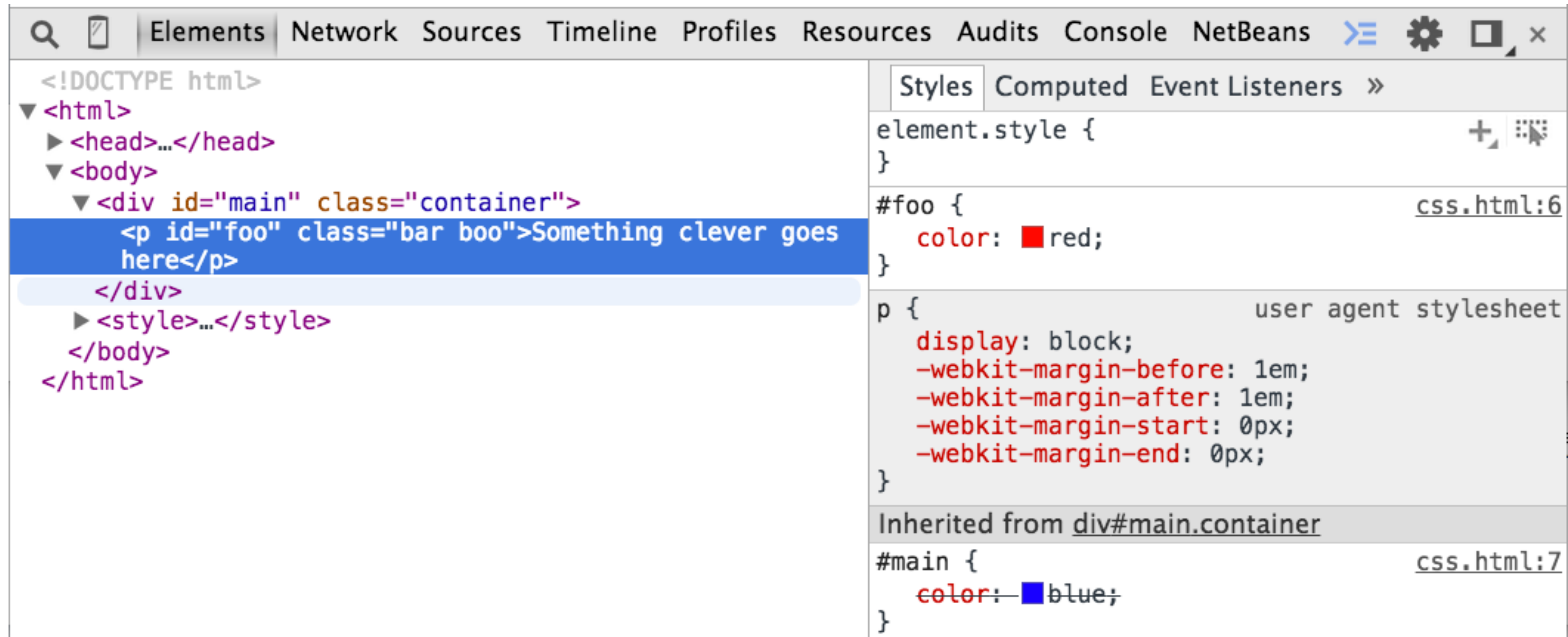
Explanation:

Both declarations apply to the `<p>` element (the first because `p` the second because `.boo`).

They have the same specificity (0-1-1), therefore the last rule of declaration decides.

When in doubt

- Use the browser's developer functions



Best practices

- Minimize the number of selectors
- Use ID to make a rule more specific
- Never use **!important**