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SCHOOL OF ENGINEERING AND DIGITAL SCIENCES

Web Programming and Problem Solving

CSS (part 2)

Date: 11.09.2022

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Content

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- CSS selectors
  - DOM-based
  - Pseudo-class
  - Pseudo-elements
- Conflict Resolution
- Box Model
- Website Layout

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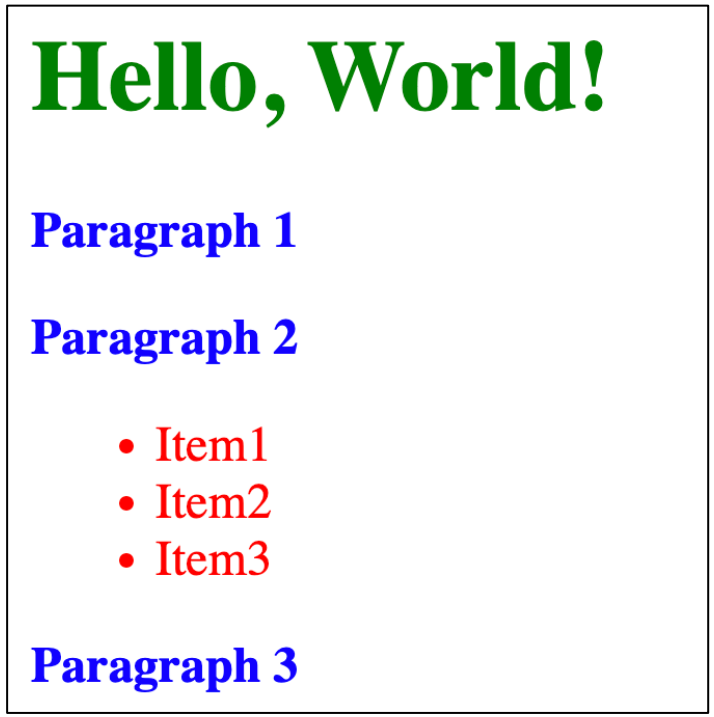
CSS Selectors

- What if we want to change a particular paragraph?
  - How do we select a specific element?
- What if one element is changed in several places?
  - How to resolve the conflicts?



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CSS Selectors

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- To distinguish between elements, we use selectors:
  - Element Types (Tags)
  - Element Classes
  - Element Attributes
  - Element IDs
  - DOM-based
  - Pseudo-class
  - Pseudo-elements

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Element Selectors

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Selection of one or more **elements**:

```
body {
  margin: 0;
  padding: 0;
}

h1, p {
  color: blue;
  font-size: 12pt;
}
```

Selects and changes the properties of body element

Selects and changes the properties of h1 and p elements
(*Note the comma in between*)

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Class Selectors

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Class is an identifier that can group together multiple elements

```
<p class="second"> … </p>

<li class="second item"> … </li>
```

Definition of the class **second** for two elements. Elements can belong to several classes.

```
.second {
  color: red;
}

li.item {
  color: purple;
}
```

Selects the elements with the specified class (second or item)

Note a dot before class name

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Attribute Selectors

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Selection of the elements by their attributes

```
h1[style] {
  text-align: center;
}

li[name] {
  color: gray;
}
li[name="item1"] {
  color: orange;
}
```

Selects all h1 tags with their style attribute defined

Selects all li elements with their name attribute defined as well as those which have specific value for name attribute

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ID Selectors

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ID is an identifier of an element unique within the document

```
<p id="last"> … </p>
```

Assignment of **ID** to the element

```
#last {
  color: red;
  font-size: 15pt;
}
```

Selects the elements by its **ID**

Note a hash before the ID

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DOM

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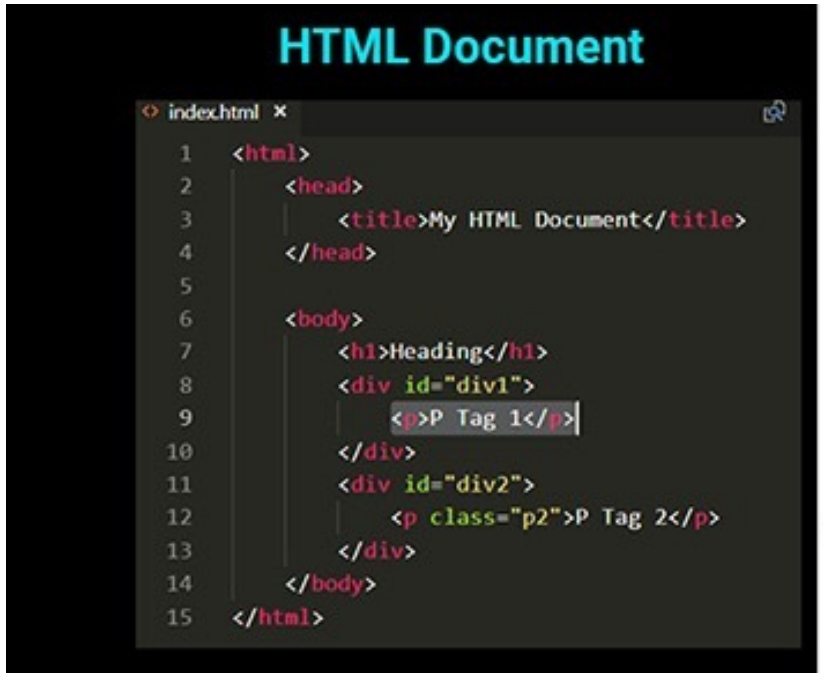
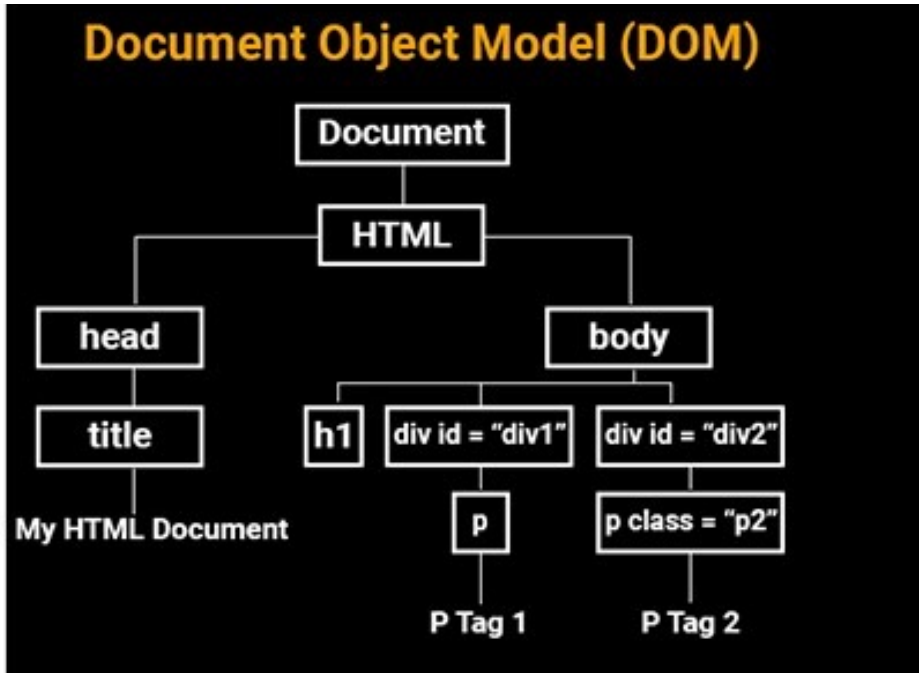
- HTML document can be viewed as a **tree**-like structure.
- This structure is represented as **Document Object Model (DOM)** in memory

- Elements are called nodes, such as:
  - Root (Document)
  - Parent
  - Child/Children
  - Siblings (head, body)





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Children Selectors

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To select direct children of some element, use **>** :

```
ul > li {
  color: red;
}
```

Selects only the direct **li** elements of **ul**

To select any other direct child of some element:

```
body li {
  color: green;
}
```

Selects all **li** elements of **body**

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Pseudo-Class Selectors

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A pseudo-class is used to define a special **state** of an element.

The syntax:

```
selector:pseudo-class {
  property: value;
}
```

```
/* unvisited link */
a:link {
  color: red;
}
/* visited link */
a:visited {
  color: green;
}
/* mouse over link */
a:hover {
  color: hotpink;
}
/* selected link */
a:active {
  color: blue;
}
```

a tag's states

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Pseudo-Class Selectors

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To select the **first child** of an element:

```
ul li:first-child {
  color: blue;
}
```

To select the **n-th child** of an element:

```
ul li:nth-child(3) {
  color: green;
}
```

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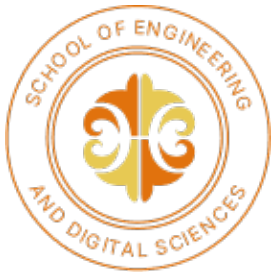
Pseudo-Element Selectors



A pseudo-element is used to define a special **state** of an element.

The syntax:

```
selector::pseudo-class {
  property: value;
}
```

Note **double colon** in syntax

```
p::first-letter {
  color: red;
}
p::first-line {
  color: black;
}
p::selection {
  color: red;
  background: yellow;
}
::marker {
  color: orange;
}
```

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Conflict Resolution

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Application of CSS rules depends on three main concepts:

- **Cascade**
- **Inheritance**
- **Specificity**

To resolve the conflicts, we need to understand them well.

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Cascade

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Cascade is a concept which means that the origin and the order of CSS rules matter, i.e. the latest rules is applied

```
h1 {
  color: blue;
}
/* this rule overrides
   the previous rule */
h1 {
  color: green;
}
```

Source order only matters when the specificity weights of the rules are the same!

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Specificity

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Specificity is the weight that the browser uses to decide which property value is applied to an element.

Weight is composed of 4 numbers based on
the location of a rule and the number of appearance of the selectors

Inline style	ID selector	Class, pseudo-class, attribute selectors	Element, pseudo-element selectors

More important

Less important

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Specificity

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Selector	Inline	ID	Class	Element	Specificity
h1	1	0	0	1	[1,0,0,1]
p	0	0	0	1	[0,0,0,1]
p.second	0	0	1	1	[0,0,1,1]
ul li:first-child	0	0	1	2	[0,0,1,2]
#last	0	1	0	0	[0,1,0,0]

```
#last{
   color: blue;
}
```

vs

```
body p:last-child{
   color: green;
}
```

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Inheritance

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Inheritance means that elements can inherit the properties defined in their parents or ancestors.

- Some properties can't be inherited like *weight* or *margin*.
- CSS provides five special property values for elements:
  - inherit – turn on inheritance
  - initial – property's default
  - revert – browser's default
  - revert-layer – previous layer
  - unset – set to inherit or initial

```
body {
  color: blue;
}
/* revert to browser's
   default value*/
h1 {
  color: revert;
}
```

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!important

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Importance is the mechanism to apply a rule no matter what the order, specificity or inheritance of other rules

```
h1 {
  color: blue !important;
}
/* this rule is not applied */
h1 {
  color: green;
}
```

However, it is **not** recommended to use it unless really necessary

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Summary

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- **Key takeaways**:
  - The selection can be done:
    - using element's type, class, attributes and ID
    - based on DOM (structure of HTML)
    - Using psedo-classes and pseudo-elements
  - Three concepts are important in conflct resolution
    - Cascade
    - Specificity
    - Inheritance
  - Use **important** keyword only when really necessary

Thanks for Attention!