Cascading Style Sheets

pdf

Concept

- Language used to associate **styles** to documents
- Companion specification to HTML
  - But can be applied to any document structured as a tree (e.g. HTML, XML, SVG)
- Separation CSS / HTML
  - To manage **presentation aspects** (CSS) separately from **structural aspects** (HTML)
  - To present the content differently to different users using different CSS
  - To present different HTML content with the same presentation aspects, same CSS
- Demonstration
  - Deactivate CSS

A bit of history

- CSS 1.0 (1996)
- CSS 1.0 (2nd ed., 1999)
- CSS 2.1 (2011) :
  - Stable version, implemented interoperably by browsers
- CSS 3 :
  - Modular specification of CSS 2.1
  - Many additions (50+ modules, see list of specifications)
  - Partly implemented by browsers

Principles

- Language based on **rules** to be associated with document elements
- Each rule sets some **properties** on some elements
  - A rule is one or more **selectors** and a **declaration block** (block of properties)
- Types of properties (more than 400 defined)
  - Visual properties (`background-*`, `border-*`, ...)
  - Text properties (`text-*`, `font-*`, `color`, ...)
  - Box properties (`padding-*`, `margin-*`, ...)
  - other properties (`visibility`, `display`, `z-index`, ...)
- **Style Sheet**
  - A set of rules in a separate file is a style sheet
  - Multiple style sheets can be applied to a document
    - Author style sheets
    - User style sheets
    - Device Style sheets

Declaration of properties

- each property is declared using the syntax : property_name + ‘ :’ + value

```
font-weight: 600       /* property with a unitless number valu
font-size: 16px        /* property with a number value with un
width: 99%             /* property with a percentage value */
background-color: red  /* property with a keyword value */
font-family: 'Arial'   /* property with a string value */
background-image: url('http://my.server.com/clear.png') /* pro
```

- use of ; to group properties applying to the same element(s)

```
background-color: red; font-size: 16px;
color: red;
width: 50%;
```

CSS Units

- Size and position units
  - Absolute units
    - `px`
    - `pt`, `pc`, `cm`, `mm`, `in` : 1in = 2.54cm = 25.4mm = 72pt = 6pc
  - Relative units
    - percentage units (`%`)
    - Font-relative units : `em`,`ex`,`ch`,`rem`
    - Viewport relative units : `vw`,`vh`,`vmin`,`vmax`
- Other units
  - `deg`,`grad`,`rad`,`turn`
  - `s`,`ms`
  - `Hz`,`kHz`
  - `dpi`,`dpcm`,`dppx`

Selectors

Select to which element(s) a block of properties apply (using `{ }`)

- Selecting elements in the document tree by tag name

```
p { /* these properties apply to all p elements in the page *
  border-style:solid;
  border-width:5px;
}
```

- Selecting using multiple tag names (separated by a comma)

```
h1, em { /* these properties apply to all h1 and em elements
  color: blue;
}
```

Selectors - more

- Addressing of 1 specific element in the document tree by `id` attribute using #

```
<!-- HTML -->
<p id="p1">text 1</p> <!-- each par has a unique id attr -->
<p id="p2">text 2</p>
```

```
/* CSS */
#p2 { /* this prop applies to the element whose id is p2 */
    color: red;
}
#p1 { /* this prop applies to the element whose id is p1 */
    color: blue;
}
```

- Addressing of several specific elements by class name using .

```
<!-- HTML -->
<!-- each par has a class attr with one or more class values -
```

Linking CSS content with HTML content

- Via the `style` attribute (**inline stylesheet**)
  - Styles attached to a given element (*syntax without selector*)

```
<p style="color:red;">text</p>
```

  - should be avoided
- Via the `style` element (**internal stylesheet**)
  - Styles attached to a given document

```
<head>
 <style>
 p { color: red; }
 </style>
</head>
```

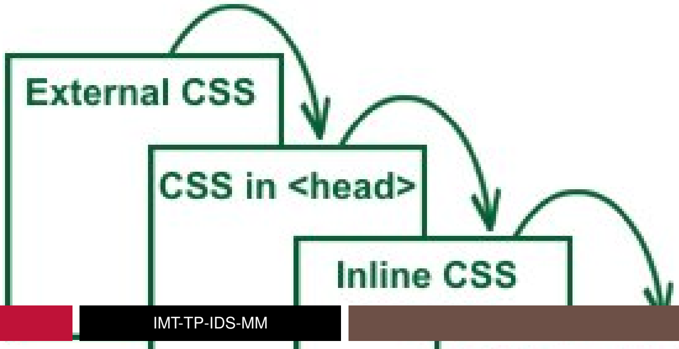
  - should be avoided
- Via an external stylesheet (separate file)
  - Styles can be attached to a document

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

  - should be preferred

CSS Cascade

- If different rules conflict (e.g. when multiple style sheets are used)
- The rule that has precedence is determined by :
  - media type of style sheet
  - origin of rule (user agent, user, author, !important author, !important user)
  - specificity of the selector
  - order in file



Example of a CSS property definition

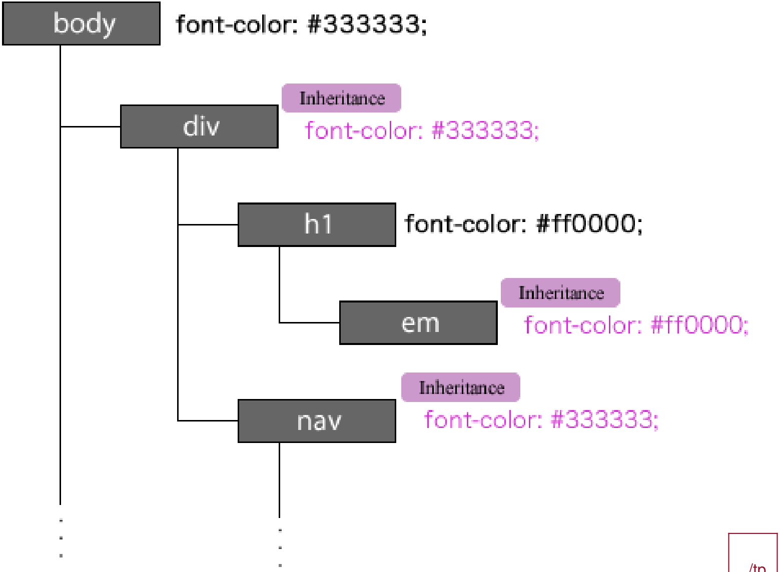
The **border-top-width** property

Syntax : <length> | thin | medium | thick

Definition :

Initial value	`medium`
Applies to	all elements. It also applies to `::first-letter`.
Inherited	no
Media	visual
Computed value	the absolute length or `0` if `border-top-style` is `none` or `hidden`
Animatable	yes, as a length

CSS Inheritance



CSS Inheritance

- For a given element, if the value for a given property is **not specified**, the value is obtained as follows :
  - if the property is inheritable by default (i.e. “inherited : yes”),
    - if the element has a parent in the DOM tree, the **computed value** on that parent is used

```
p { color: green }
```

```
<p>The text and the span will be <span>green</span> because
```

    - otherwise (for the root), the **initial value** is used.
  - if not (i.e. “inherited : no”), the **initial value** is used

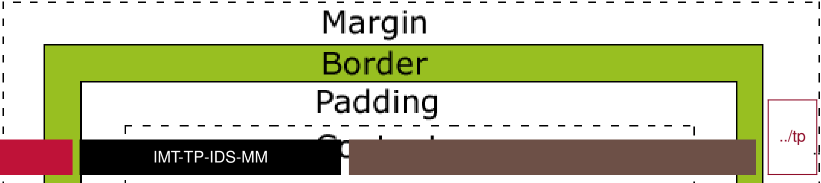
```
p { border-width: 1px }
```

```
<p>Only the text will have <span>a border</span> because
```

- The computed value is obtained :
  - by converting a relative value (when possible) to an absolute value
  - otherwise (% values when layout is involved), using the relative value

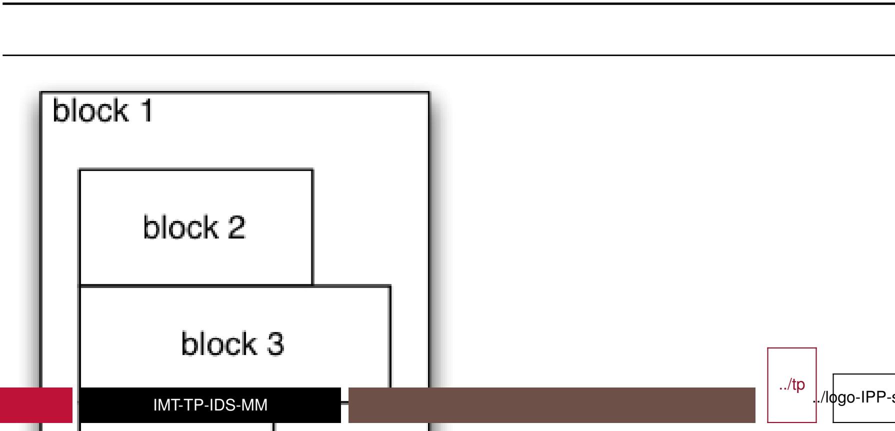
The CSS Box Model

- Each element in the DOM produces zero, one or several boxes depending on the type of element
  - The page rendering consists in displaying those boxes
- Each box has generic properties that controls some generic aspects : margin, border, padding
- The layout (size and position) of a box depends on multiple factors :
  - The size of the box and of its content (e.g. images)
  - The type of box (block, inline, . . .)
  - The positioning scheme : normal, absolute, float
  - The other elements and boxes around (siblings, parent, containers)
  - The viewport (e.g. the window size)



CSS Box Types

- There are 2 main types of boxes :
  - **block** boxes : Boxes that don't display on the same line as the previous box and as the next box
    - Sizing properties such as `width` and `height` can be used.
  - **inline** boxes : Boxes that stay on the same line as the previous box and the next box (when possible)



CSS Box Types (continued)

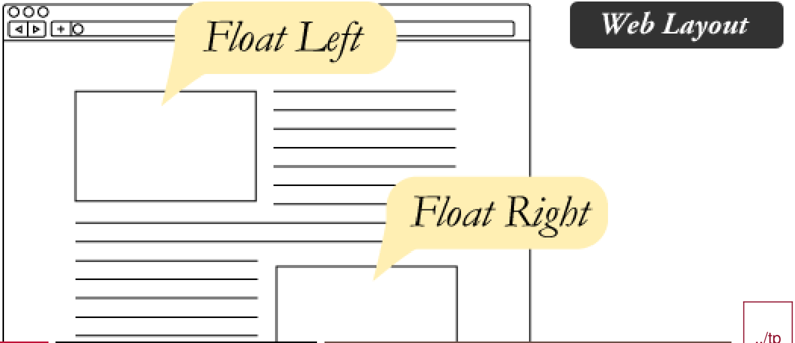
- The type of box is defined by the standard :
  - block boxes : p, div, h1, h2, footer . . .
  - inline boxes : a, img, span . . .
- The default type can be overriden by the **display** property

```
<p>A first par</p>
<p>A second par</p>
<a>A first link</a>
<a>A second link</a>
```

```
p { display: inline; }
a { display: block; }
```

CSS Positioning Schemes

- CSS defines the `position` property with the values
  - `static` : default value
  - `relative` : moved compared to its original position (initial place left empty)
  - `absolute` : positioned relative to the origin of the parent box
  - `fixed` : positioned relative to the window
- Floats



Responsive Design

Principles

- Design pages that adapt to the screen size using CSS Media Queries

CSS Media Queries

- Adapt the CSS rules to apply based on client characteristics
    - Screen size, aspect-ratio, resolution or orientation
    - Type of device (pc, mobile, printer . . .)
    - Number of colors

```
<link rel="stylesheet"
      media="screen and (max-width: 1280px)"
      href="file.css" />
```

or

```
<link rel="stylesheet"
      href="file-with-mediaqueries.css" />
```

```
@media screen and (max-width: 1280px)
{
    /* SomeCSS ruleshere */
}
```

Advanced Selectors

All elements :

Elements with a given attribute :

Elements with a given attribute value :

Element as a descendant of another :

Element as a child of another :

Element preceded by another :

Pseudo-classes

Pseudo-elements

../tp

../logo-IPP-s

Advanced property notation

- Short-hand notation
  - group several related properties into one
  - specific order without missing properties

```
padding: 4px 9px;
border: 1px solid #fff;
box-shadow: inset 0 1px 2px rgba(0,0,0,.3);
```

- Vendor-prefix notation (`-o-`, `-ms-`, `-moz-`, `-webkit-`,...)

```
-moz-box-shadow: inset 0 1px 2px rgba(0,0,0,.3);
-webkit-box-shadow: inset 0 1px 2px rgba(0,0,0,.3);
```

Authoring CSS

- Many web sites offer free CSS templates
  - http://www.free-css.com/
  - http://templated.co/
  - . . .
- CSS tools
  - Pre-processors to generate CSS
    - SASS
    - LESS
  - WYSIWYG editors
    - BlueGriffon
    - SelfCSS
  - Responsive front-end frameworks
    - Bootstrap
    - Foundation

Summary of this lesson

- history, principle
- syntax, properties
- selectors, link with HTML
- inheritance, box model
- responsive design, media queries
- authoring