Search Engines

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(JavaScript & Co)

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Goal of Today's Lecture

- Learn how to implement ...
  - ... an interactive web application using JavaScript & Co
- Learn the basics about the following technologies
  - DOM (document object model)
  - CSS (cascading style sheets)
  - JavaScript
  - jQuery (a very cool JavaScript library)
  - XML (extensible markup language)
  - AJAX (asynchronous JavaScript and XML)

for the exercises you will do something similar

CSS

- Cascading style sheets (CSS)
  - separate the formatting of an html page from its contents
  - where formatting comprises
    - fonts (types, sizes, etc.)
    - colors
    - spacing
    - etc.
  - very simple language, for example:

```
h1 {
  color: darkblue;
  text-size: 200%;
}
```

DOM

- Document Object Model (DOM)
  - tree-like representation of the elements of an HTML page or of an XML document
  - for example

```
<body>
  <h1>The header</h1>
  <p>First paragraph.</p>
  <h2>A second-level header</h2>
  <p>And so on ...</p>
</body>
```

  - then refer to contents of second paragraph as

```
document.getElementsByTagName(“p”).innerHtml
```

JavaScript

- JavaScript
  - object-oriented scripting language
  - with a syntax very similar to Java, hence the name
  - for use in web applications
    - loaded onto clients computer via web brower
    - dynamic modification of current (HTML) page

      (by manipulating the DOM representation)
    - communication with other programs via AJAX
  - easy to use
  - but hard to debug without the right tools

    (the browser won't give any error messages)

jQuery

- jQuery is a JavaScript library
  - do the things you need all the time fast and easy
    - change a part of the HTML
    - associate an action with an event, e.g. a button click
    - AJAX communication
    - standard UI elements
  - deal with all the cross-browser issues
    - many subtle differences between browsers
    - heavy burden if you program in raw JavaScript
    - jQuery takes that away from you

XML

- Extensible Markup Language (XML)
  - nothing but a standard for representing semi-structured documents
    - structured = records with a fixed number of fields of a well-defined type (like in a database table)
    - unstructures = free text
    - semi-structured = free text with some hierarchical structure
  - for example

```
<?xml version="1.0" encoding="UTF-8" ?>
<document>
  <creation-date>2009-12-03</creation-date>
  <content>Here comes the content ...</content>
</document>
```

AJAX

- Asynchronous JavaScript and XML
  - in interactive applications you often want to let the client talk to another (remote) computer
  - for example, after a key is typed, send a query to the search engine backend, and show the results on the page
  - this communication should be asynchronous
    - you send the query
    - you get notified when the result is there
    - in the meantime you can do something else
  - AJAX is simply the standard way of doing this
    - result is returned as XML, hence the X

Exercise Sheet 7

- This is how your HTML table should look like
  - for example, for a prefix rel
  - Note: it doe not have to look exactly like this, this is just to give you an idea of what Exercise 3 is asking for

<table>
<tr><th>Completion</th><th>length of inverted list</th><th>relative to total length</th><th>graphical percentage</th></tr>
<tr><td>relational</td><td>12564</td><td>25.3%</td><td>|||||||||||||</td></tr>
<tr><td>reliability</td><td>786</td><td>1.2%</td><td>|</td></tr>
<tr><td>relations</td><td>1498</td><td>10.8%</td><td>||||||</td></tr>
<tr><td>...</td><td>...</td><td>...</td><td>...</td></tr>
</table>

Exercise Sheet 7

- Alternatively, if you want, you can be creative ...
  - ... and do something completely different
  - it should be of the same kind and complexity though
  - that is, use JavaScript and talk to some backend
  - and there should be some relation to search engines
  - but otherwise you are free to do what you want
  - if you have an idea, briefly check back with us
  - but we will probably say ok, fine!