How Web Pages Work

1 HTML: How Web-Surfing the Internet Works

Usually Webpages are full of images, some text and some links pointing to yet other pages. Examples:

- Any Wikipedia page
- The results page of any Google search
- Your course page

But, how can we make a webpage? How can we write and draw things in different colors and styles?

- 1. Open your browser (Safari, Firefox or Chrome) and go to the page http://msantos.sdf.org/G9.
- 2. Now, check the source of this webpage by doing the following:
 - If you are using a Mac, simultaneously press the keys OPTION, COMMAND and U
 - If you are using a Windows or Linux, simultaneously press the keys Control and U

You'll probably think now: "What's this!? What are we seeing? This is gibberish!!".

Don't despair. What we are seeing is the "code" that makes the webpage. This is a like a program and it is run by your browser. This code is HTML "code".

HTML is the language used to edit the content of a webpage.

1.1 A first look at how HTML works

All pages in the internet have a source code that looks like this one:

1. What's the first thing we find in the source?: <!doctype html>

2. next?: <html> (ignore for a moment the option "lang=en")



Figure 1: Class slide of Wed. Oct 31, 2018. Using our browser, we can find out the actual code that makes up a given web page. The browser also has tools to *hack* the page. This, however, only has an effect on our browser: We are **not** changing the actual, original website! But it's a very easy and fun way of finding out how HTML works!

```
☆ 😓 🤅
  <html lang="en">
       <head>
          <title>G9 CS at the Dragon</title>
          <meta charset="utf-8"
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6
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12
13
14
15
16
17
       <style>
      body {background-color: beige;}
      </head>
       <body>
           <hl>G9 Introduction to Computer Technology at Dragon Academy</hl>
              You can find the lessons as written on the (smart-) boards here: <a href="https://evermeet.cx./~user055/Dragon/Lessons/CompSci/G9">Lessons</a>.
          The summaries are named and sorted by date and time. Example: the pdf file <em>20181002_122803.pdf</em> corresponds to the lesson of Oct 2nd, 2018.
18
19
          Additional material can be found <a href="Material">here</a>
      </body>
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21
22
  </html>
```

Figure 2: The source code of a webpage shows all the *instructions* that the browser needs to follow in order to correctly render the page the way we see it. The keywords starting with < and ending with > are called **HTML tags**. They describe the structure of a webpage: the title of your browser's tab, any styling set to the page, and the headers, paragraphs, images and links we see on the page.

- 3. next?: <title>
- 4. next?: the text G9 CS at the Dragon
- 5. next?: </title> (notice the forward slash /)
- 6. next?: <meta charset="utf-8">
- 7. next?: <style>
- 8. next?: the text body {background-color: beige;}
- 9. next?: </style> (notice the forward slash /)
- 10. next?: </head> (notice the forward slash /)
- 11. next?: <body>
- 12. next?: </body>
- 13. \ldots more things \ldots
- 14. next?: </html>

What patterns can we identify?

- 1. First there are many "words" that are enclosed by the smaller-than, <, and the larger-than, >, symbols. These are called **HTML tags**.
- 2. Second, some of the HTML tags come *in pairs*, where one tag has the same name but starts with a **forward slash** /. Examples:
 - <html> and </html>
 - <head> and </head>
 - <title> and </title>
 - <style> and </style>
 - <body> and </body>

The first version is called *the opening tag* (e.g., the opening **body** tag), and the second version is called *the closing (partner) tag* (e.g., the corresponding closing **body** tag).



Figure 3: Modding a webpage. Using the tools provided by our browser, we can modify the content and the looks of any page. This, however takes only effect in our computer: Anybody else in the world will keep seeing that webpage in its original version. The key shorcuts for doing this in Safari or Firefox are different, but the corresponding menu options can easily be found: Look for the keyword developer. Click on this image to see a video on how to do it. You may need to download this PDF file for the link to work.

- 3. If we compare the source code with the actual page, it seems that the title tag determines the *title of your browser's tab*.
- 4. Again, if we compare the source code with the actual page, it seems that the style tag determines the *looks* of your webpage.
- 5. ...and the body tag contains the actual content of your webpage.

2 Hack that webpage (only *locally*, in your browser, though)

We can access some developer tools from the browser using the key-combination

- In a Mac: OPTION+COMMAND+i
- In Windows/Linux: CONTROL+SHIFT+i

This will allow us to mod the webpage we are seeing right now at our liking. In this case, it will give us a chance to experiment with the HTML tags and the styling. Click on Figure 3 to see a video on how this is done.

3 Exercises

- 1. (KTIcA) Can you find out what is the purpose of the following HTML tags: <h1>, , <a>?
- 2. (kTIca) Go online and look for a simple page that contains an image. Can you find out that is the HTML tag used for inserting and controlling images in a webpage?