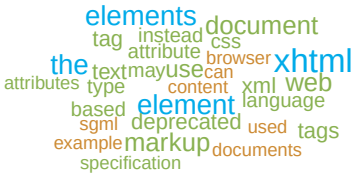
Introduction to Web Scraping with R

Inspecting the HTML Tree



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Browsing vs. scraping

Browsing vs. scraping the web

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Using your browser to access webpages

1. you click on a link, enter a URL, run a Google query, etc.
2. browser/your machine sends request to server that hosts website
3. server returns resource (often an HTML document)
4. browser interprets HTML and renders it in a nice fashion

Browsing vs. scraping the web

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Using R to access webpages

1. you manually specify a resource
2. R/your machine sends request to server that hosts website
3. server returns resource
4. R parses HTML, but does not render it in a nice fashion
5. it's up to you to tell R what content to extract

Interacting with your browser

On web browsers

- modern browsers are complex pieces of software that take care of multiple operations while you browse the web
- common operations: retrieve resources, render and display information, provide interface for user-webpage interaction
- although your goal is to automate web data retrieval, your browser is an important tool in web scraping workflow

Interacting with your browser

The use of browsers for web scraping

- give you an intuitive impression of the architecture of a webpage
- allow you to inspect the source code
- let you construct XPath/CSS selector expressions with plugins
- render dynamic web content (JavaScript interpreter)

Interacting with your browser

The use of browsers for web scraping

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- let you construct XPath/CSS selector expressions with plugins
- render dynamic web content (JavaScript interpreter)

A note on browser differences

- inspecting the source code (as shown on the following slides) works more or less identically in **Chrome** and **Firefox**
- in **Safari**, go to → `Preferences`, then → `Advanced` and select "Show Develop menu in menu bar". This unlocks the "Show Page Source" option and the Web Developer Tools

Inspecting the HTML source code

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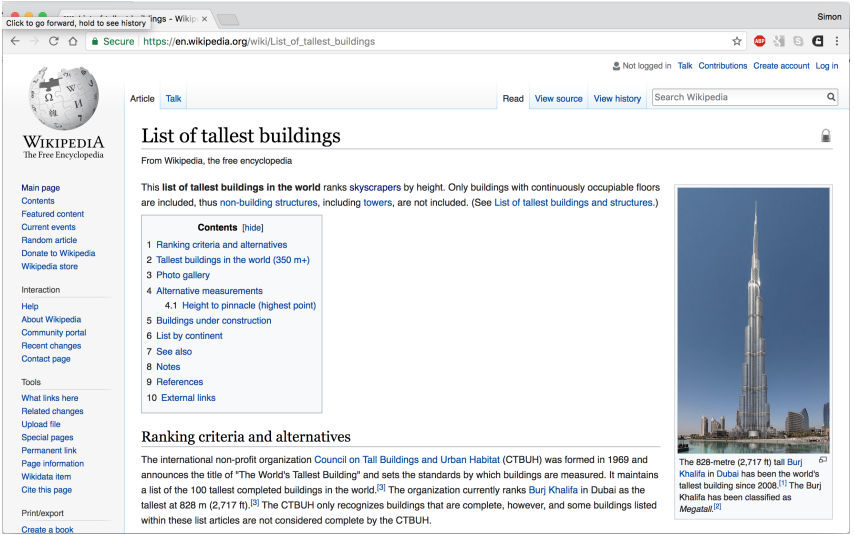
Example

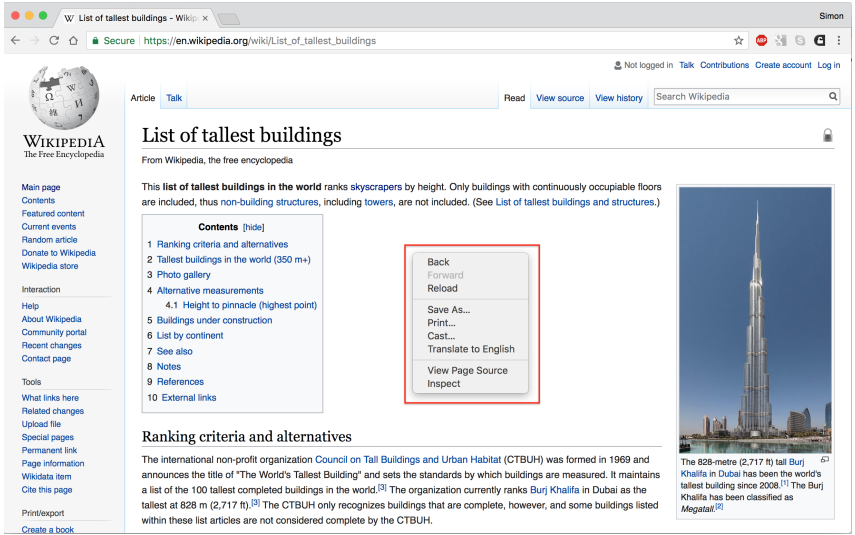
- browser: Google Chrome
- source: https://en.wikipedia.org/wiki/List_of_tallest_buildings



Inspecting the HTML source code

Example

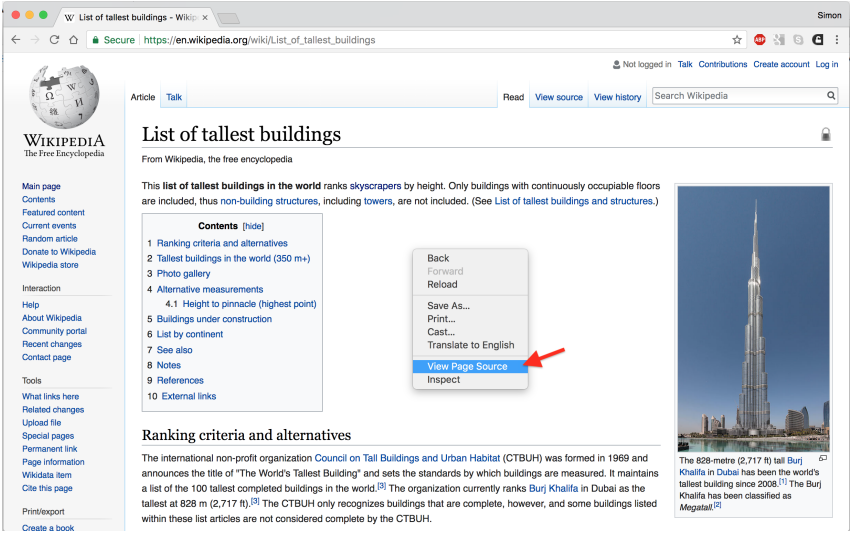
- browser: Google Chrome
- source: https://en.wikipedia.org/wiki/List_of_tallest_buildings
- right-click on page



Inspecting the HTML source code

Example

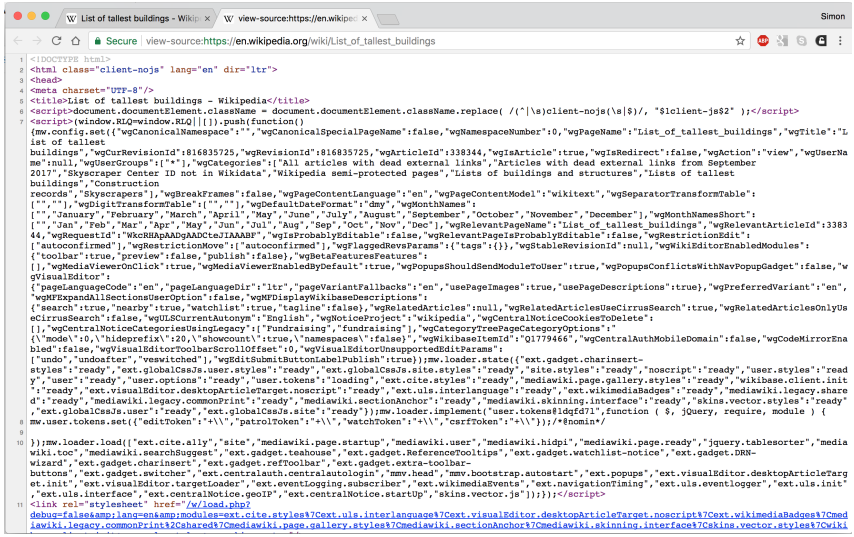
- browser: Google Chrome
- source: https://en.wikipedia.org/wiki/List_of_tallest_buildings
- right-click on page
- select "View Page Source"



Inspecting the HTML source code

Example

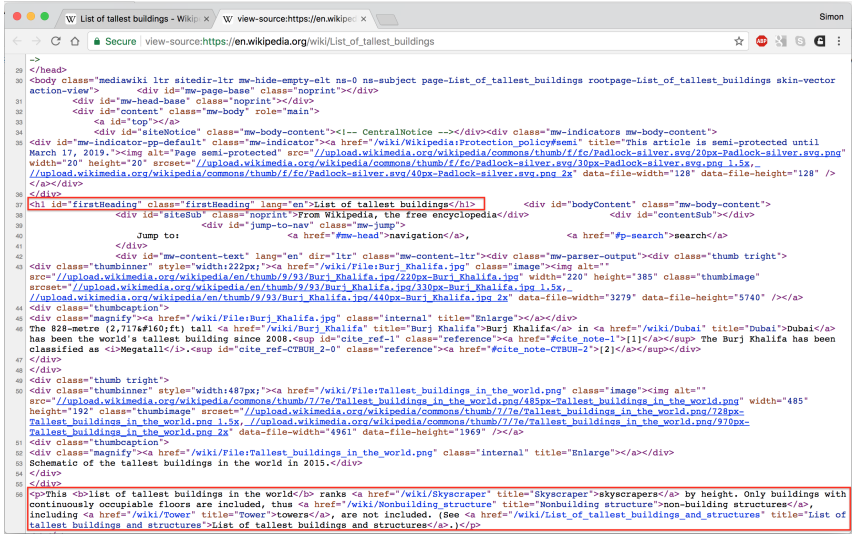
- HTML (and JavaScript) code can be ugly...



Inspecting the HTML source code

Example

- HTML (and JavaScript) code can be ugly...
- but looking more closely, we can find the displayed information

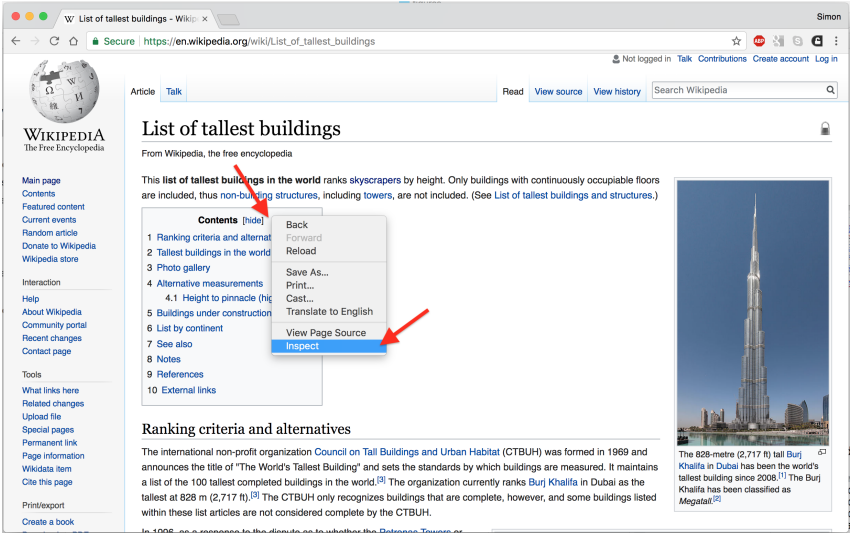


Inspecting the live HTML tree

Inspecting individual elements and the live HTML tree

Example

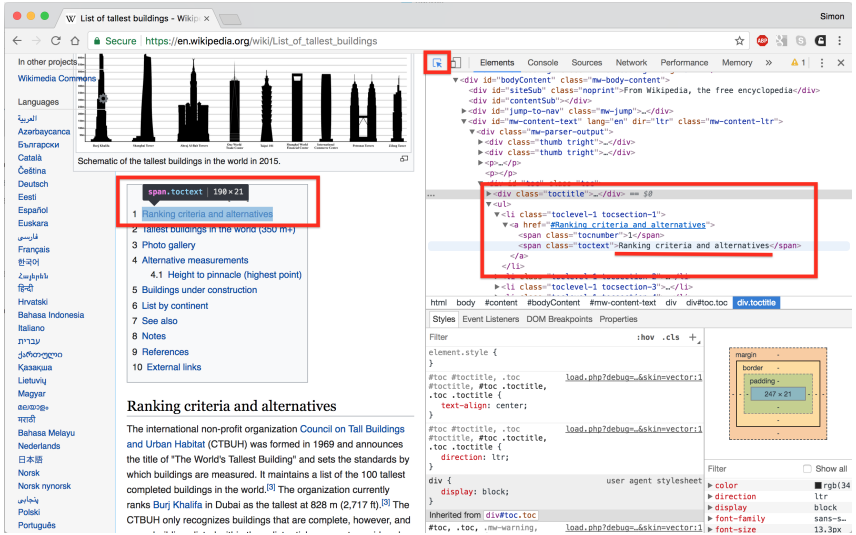
- another way of inspecting the HTML code is to use the **Web Developer Tools**
- to that end, do:
- right-click on element of interest
- select "Inspect"



Inspecting individual elements and the live HTML tree

Example

- the Web Developer Tools window pops up
- corresponding part in the HTML tree is highlighted
- you can hover over other parts of the code to get an instant view of the page at that position
- click on arrows to expand/hide tags



Summary

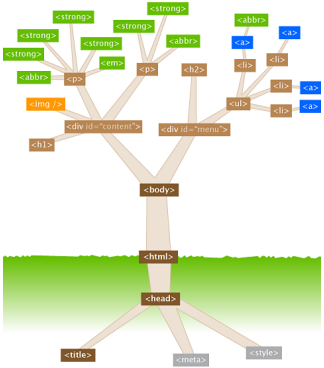
Summary

When to inspect the complete page source

- check whether data is in static source code
- for small HTML files: understand structure
- count tables

When to inspect individual elements using the Web Inspector Tools

- almost always
- partcularly useful to construct XPath/CSS selector expressions
- to monitor dynamic changes in the DOM tree (see later)



Source:
http://watershedcreative.com/naked/html-tree.html