Data Storytelling Studio

getting & cleaning data

CMS.631/831

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Agenda

- [10] Review data logs
- [10] Getting data
- [10] Grad student presentation on open data papers
- [20] Cleaning data
- [10] Presentation crit
- [5] Homework prep

data log
pair & share

the most nefarious?

the most benign?

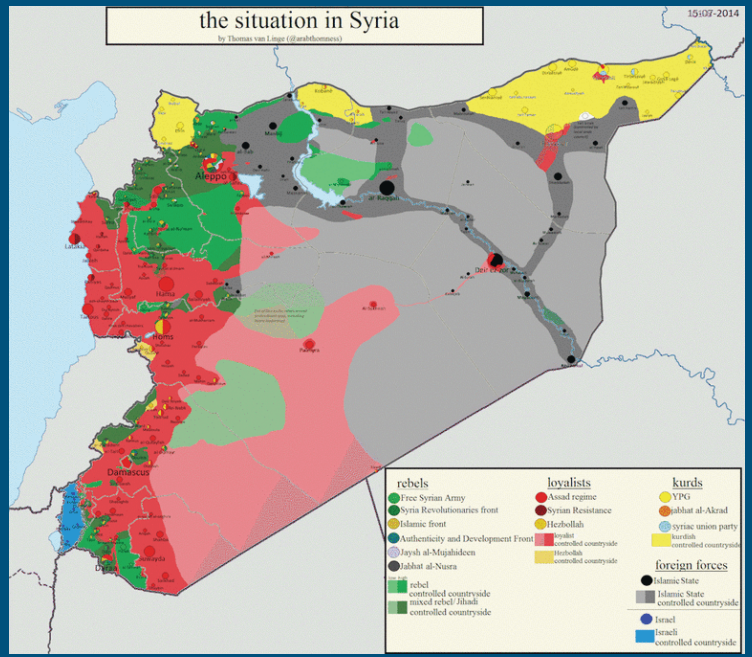
the most surprising?

Getting data

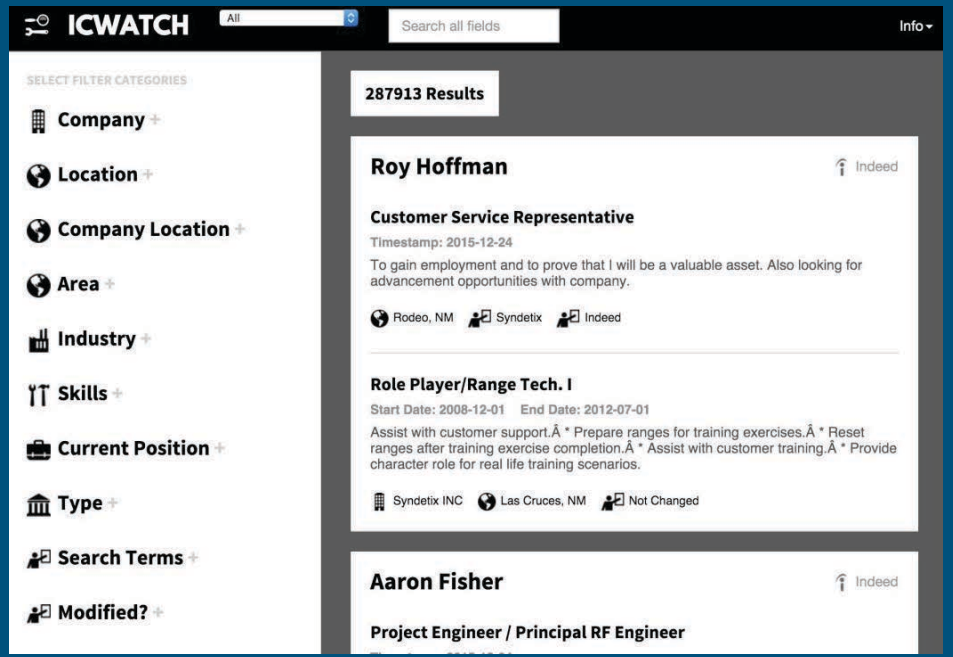
Sources of Data

- Official sources (ie. govt agency)
- Advocacy / interest groups
- Personal knowledge
- Make it yourself

If the data doesn't exist?

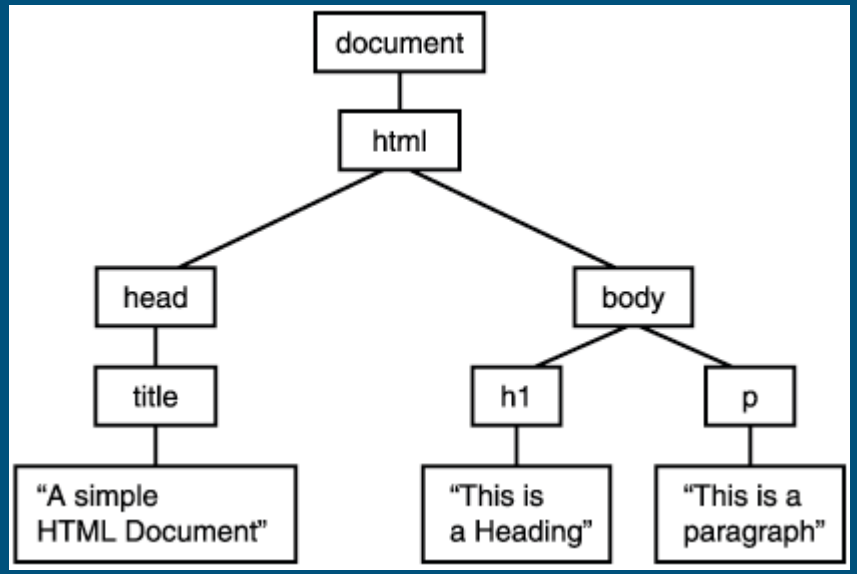


https://syriancivilwarmap.com/



https://icwatch.wikileaks.org/

Document Object Model (ie. "the DOM")




```
<!DOCTYPE html>
<html class=" js no-touch localstorage applicationcache svg inlinesvg display-table enhanced enhanced-rendering fontface" style>
▶ <head>…</head>
▼ <body itemscope itemtype="http://schema.org/WebPage" class="type-home logged-out">
    <!-- empty statusBar  -->
  ▼ <div id="contain">
      <!-- Page header -->
      <!-- topSection1 / -->
    ▼ <header class="bg-header clearfix">
        ::before
      ▶ <div class="bg-header__subinfo bg-header__subinfo--tablet">…</div>
      ▶ <div id="smartbar" class="bg-header__smartbar bg-header__smartbar--show" data-hide-on-load="true">…</div>
      ▶ <div class="bg-header__menus">…</div>
      ▶ <div class="bg-header__subinfo">…</div>
      ▶ <div href class="bg-header__centerpiece bg-header__logo-wrapper">…</div>
      ▼ <nav class="bg-header__nav">
          ▶ <ul>…</ul>
        </nav>
      ▶ <nav class="bg-header__takeover" aria-hidden="true">…</nav>
      ▶ <aside class="bg-header__pop-up" aria-hidden="true">…</aside>
        ::after
      </header>
    ▶ <div class="bg-header__smartbar--veil bg-header__smartbar--veil-show">…</div>
      <!-- Page header ends -->
      <div class="ad billboard" id="ad_outofpage2" data-adname-complete="true"></div>
```

Tools to Scrape

open data papers

Joel Gurin. 2014. Open Governments, Open Data: A New Lever for Transparency, Citizen Engagement, and Economic Growth. SAIS Review of International Affairs 34, 1 (2014), 71–82.

Michael B. Gurstein. 2011. Open data: Empowering the empowered or effective data use for everyone? First Monday 16, 2 (January 2011).

How have you seen data stored?

Storage strategies

- .csv files
- relational databases
- non-relational databases
- text files
- .pdf files
- HTML tables

What is "clean" data?

Clean Data

- **Consistency**: are observations always entered the same?
- **Completeness**: do you have coverage of the topic?
- **Usability**: machine readability?
- **Atomicity**: row-based normalization

Since we use machines to operate on data, machine-readability is a strong criteria.

And don't forget about the metadata!

See the Quartz guide to bad data

About "Tidy" Data

Hadley Wickham. 2014. Tidy Data. Journal of Statistical Software 59, 10 (August 2014).

Tools to clean

Cleaning geographic data

Geoparsing: finding references to geographic places in text

tricky, but my Cliff tool does some of this

Geocoding: turning an address into latitude/longitude coordinates

BatchGeo can do a lot for you for free

Getting data out of PDF files

assuming the text is readable:

Let's open up an example PDF and try out Tabula (the best I've seen so far)

If you're a programmer, pdftables is a useful option

if it is an image:

you're in trouble - the automated OCR toolchain isn't great

Cleaning text / numbers

misspellings? try OpenRefine to cluster them

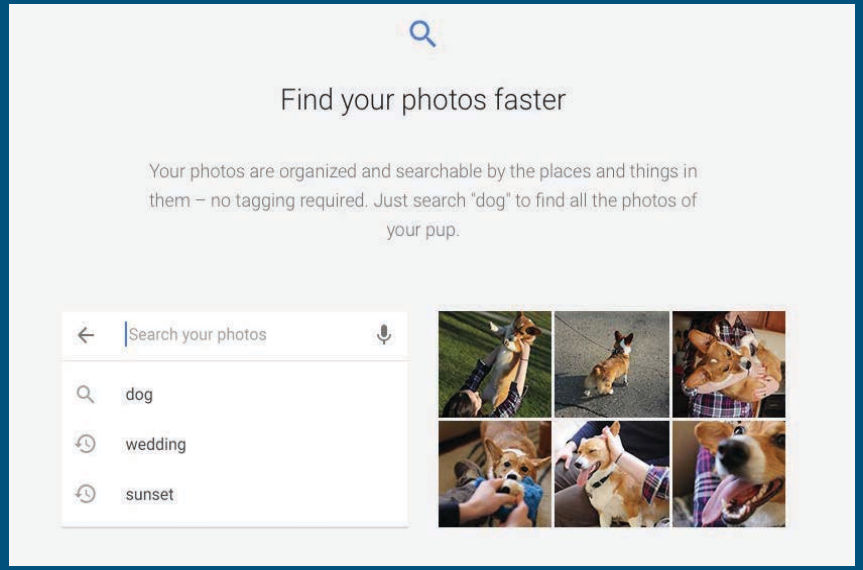
extracting data? try regular expressions (use a cheatsheet) (learn it yourself)

splitting columns? remember Excel can do some of this

anonymizing? scrubadub.io is an in-progress tool to help

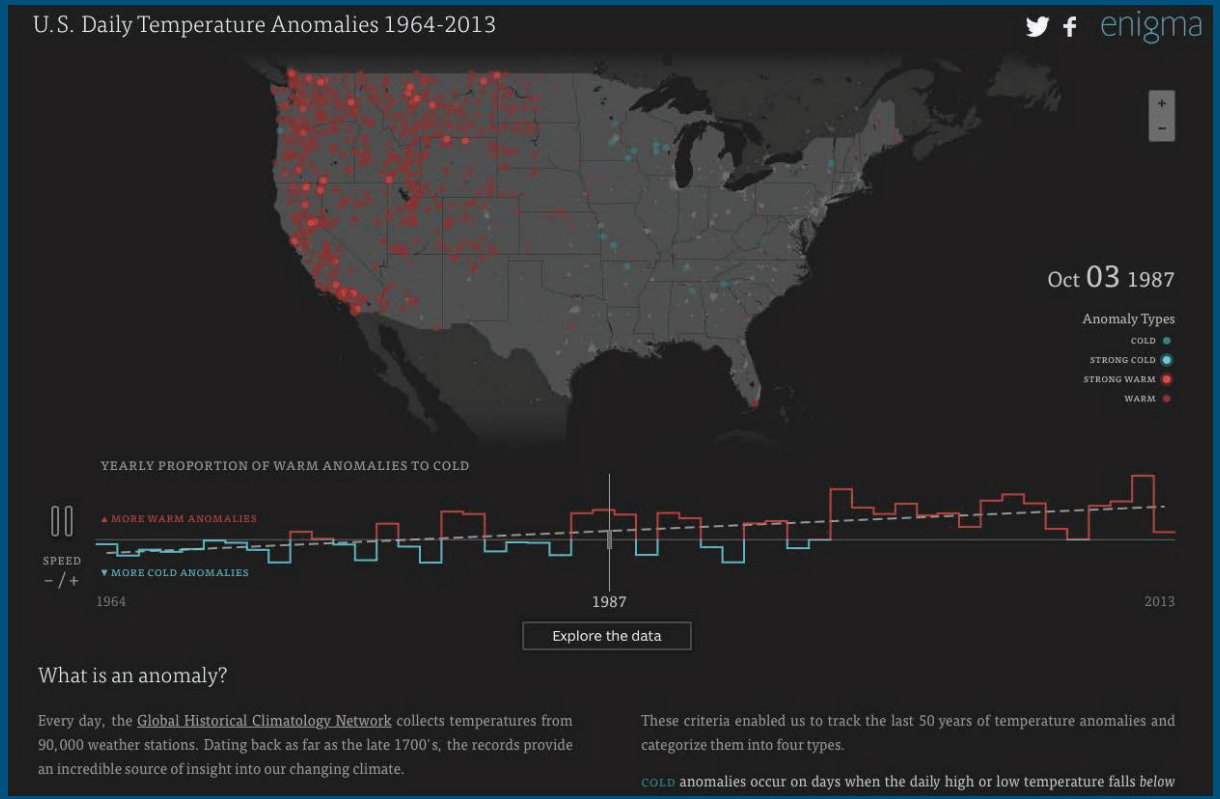
Using image data

You can analyze images qualitatively and quantitatively by repurposing tools like Google Photos.



Another critique

A more complex example



bit.ly/climate123

homework

- install Tableau
- read stuff
- grad student to present reading on machine learning & big data

CMS.631 Data Storytelling Studio: Climate Change
Spring 2017