Web Scraping: Room Full of Interns in a Box

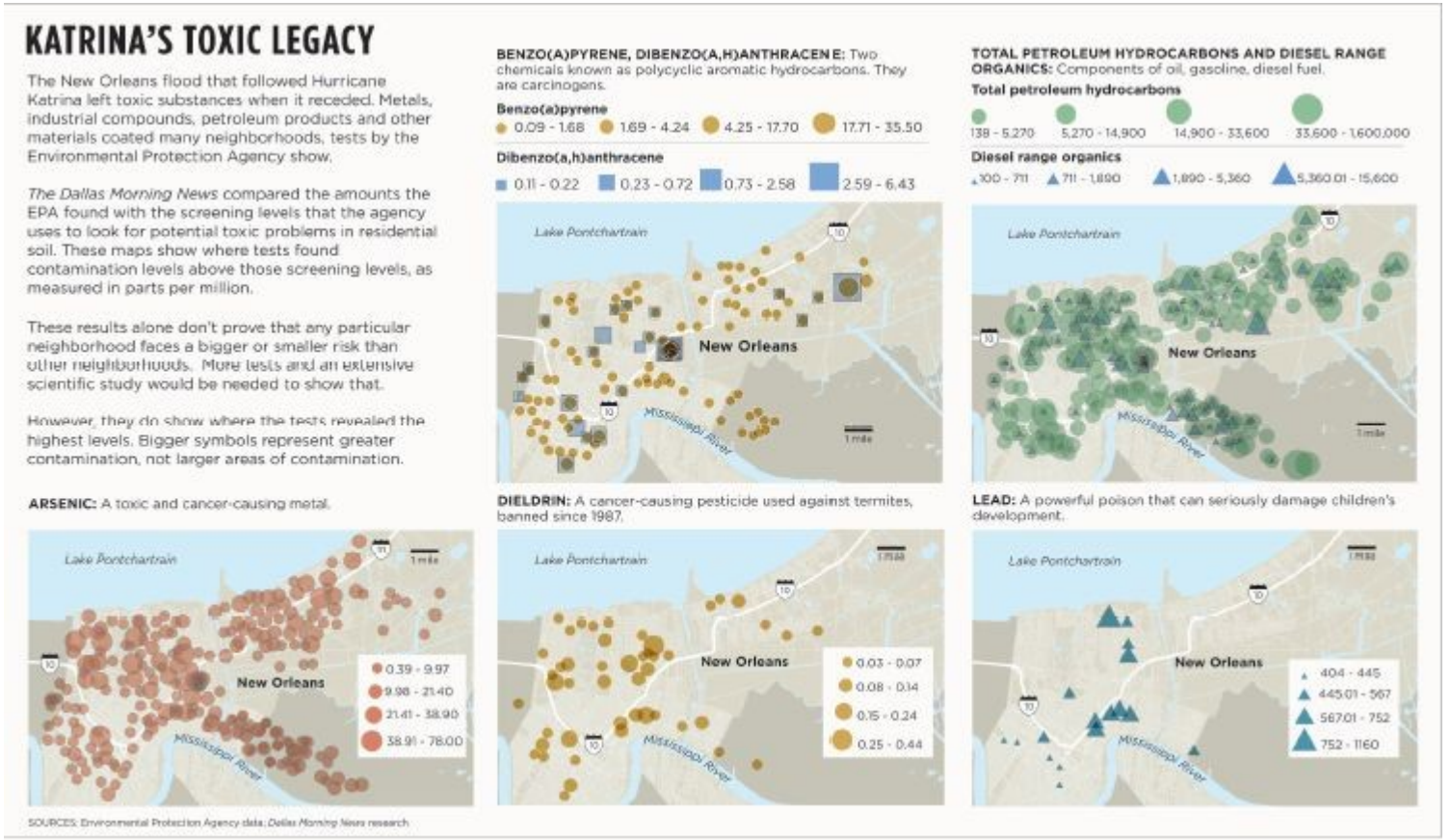
What it's good for

- For a Kansas City Star series on the insurance industry, I scraped 35 million insurance complaint data from the National Association of Insurance Commissioners.
- At the AJC, a scrape of the state legislature's Web site resulted in a story about a legislator who missed more than 90 percent of the votes ... because he was caught in an FBI money laundering sting and had agreed not to cast votes while acting as an informant in a corruption investigation.
- The same scrape provided legislative reporters a daily spreadsheet to track bills.
- Arlen Poort, NRC Handelsblad, is scraping a site with data about home currently for sale in The Netherlands to track length of time on market, asking prices, sale prices and other indicators that might signal trend in the market.

What it's good for

- Instead of paying $1,000 a year for county assessor data, Agustín Armendariz scrapes the assessor's web site daily to capture house sales and feed them directly to a search/mapping application on the San Diego Union-Tribune Web site.
- Ian Dempsy, the Tacoma, WA, News-Tribune, scrapes the local sheriff's Web site hourly to collect jail bookings.
- Sarah Cohen, Washington Post, avoided months of FOIA delays by scraping corn subsidy data from the USDA site for a series on ag subsidies.
- For the same series, data scraped from another USDA site helped Sarah find insurance agents who had received disaster payments.
- Sarah, again, scraped the US Trade Commission site to get data for a story on special tariff exemptions passed into law as earmarks.

Jennifer LaFluer, Dallas Morning News, scraped soil sample data from the EPA Web site for a story about soil contamination after Hurricane Katrina



HTTP: Browsers Talking With Servers

Browser => HTTP request => Server

http://bolles.ire.org/dij/by-state.ptmpl?sn=FL

```
GET /dij/by-state.ptmpl?sn=FL HTTP/1.1
Host: bolles.ire.org
User-Agent: Mozilla/5.0 (Windows; U; Windows NT 5.1; en-US; rv:1.8.1.14) Gecko/20080404
Firefox/2.0.0.14
Accept: text/xml,application/xml,application/xhtml+xml,text/html;q=0.9,text/plain;q=0.8,image/png,*/*;q=0.5
Accept-Language: en-us,en;q=0.5
Accept-Encoding: gzip,deflate
Accept-Charset: ISO-8859-1,utf-8;q=0.7,*;q=0.7
Keep-Alive: 300
Connection: keep-alive
Referer: http://bolles.ire.org/dij/usa.html
```

HTTP: Browsers Talking With Servers

Browser <= HTTP response <= Server

HTTP/1.x 200 OK
Date: Thu, 05 Jun 2008 04:21:43 GMT
Server: Apache/1.3.27 (Unix) mod_fastcgi/2.4.0
Expires: Thu, 05 Jun 2008 04:26:43 GMT
Content-Type: text/html; charset=ISO-8859-1
X-Cache: MISS from localhost
Connection: close

HTML: The Document Body

Name:</td><td>Joe Adams</td></tr>
<tr><td align="right">Affiliation:</td><td>The Florida Times-Union</td></tr>
<tr><td align="right">Address:</td><td>Jacksonville FL 32202 USA</td></tr>

<tr><td align="right">Phone:</td><td>(904) 3594534</td></tr>
<tr><td align="right">Interests:</td><td>First Amendment/FOIA, Local Government/City Hall, State Government</td></tr></tbody></table>
<table border="0" cellpadding="2">
<tbody><tr><td align="right">Name:</td><td>Steve Andrews</td></tr>
<tr><td align="right">Affiliation:</td><td>NBC - WFLA-TV</td></tr>

<tr><td align="right">Address:</td><td>Tampa FL 33511 USA</td></tr>
<tr><td align="right">Phone:</td><td>(813) 221-5779</td>

Complicating factors

- JavaScript: Code is executed by the browser on the client side. Requires a JavaScript engine to interpret the code.
- AJAX: Ansynchronus requests and responses
- HTTPS: Encryption
- Denial of service attack protection
- Header User-Agent and Referrer checkers
- CAPTCHA: Completely Automated Public Turing test to tell Computers and Humans Apart
- Data validation
- Scrapers break

Tools

- The analyze a Web site: Firefox
  - Live HTTP Header
  - Web Developer
  - Firebug
- Scripting languages: Perl Python, Ruby
- Spidering helpers:
  - The old way: LWP
  - The new way: Mechanize
- Parsing helpers
  - The old way: regular expressions: /<td>(.+)<\/td>
  - The new way: Table::Extract, TokeParser, TreeBuilder, XML::DOM

Precautions

- If it's a private site, be respectful, if not blindly obedient to its terms of use agreement and robot.txt.
- Public sites are open game.
- Public or private, respect the server's bandwidth
  - Rule of thumb: no more than 2 requests/second
- Cache or download parts of the site for testing