Introduction to Computational Tools and Techniques in Social Science

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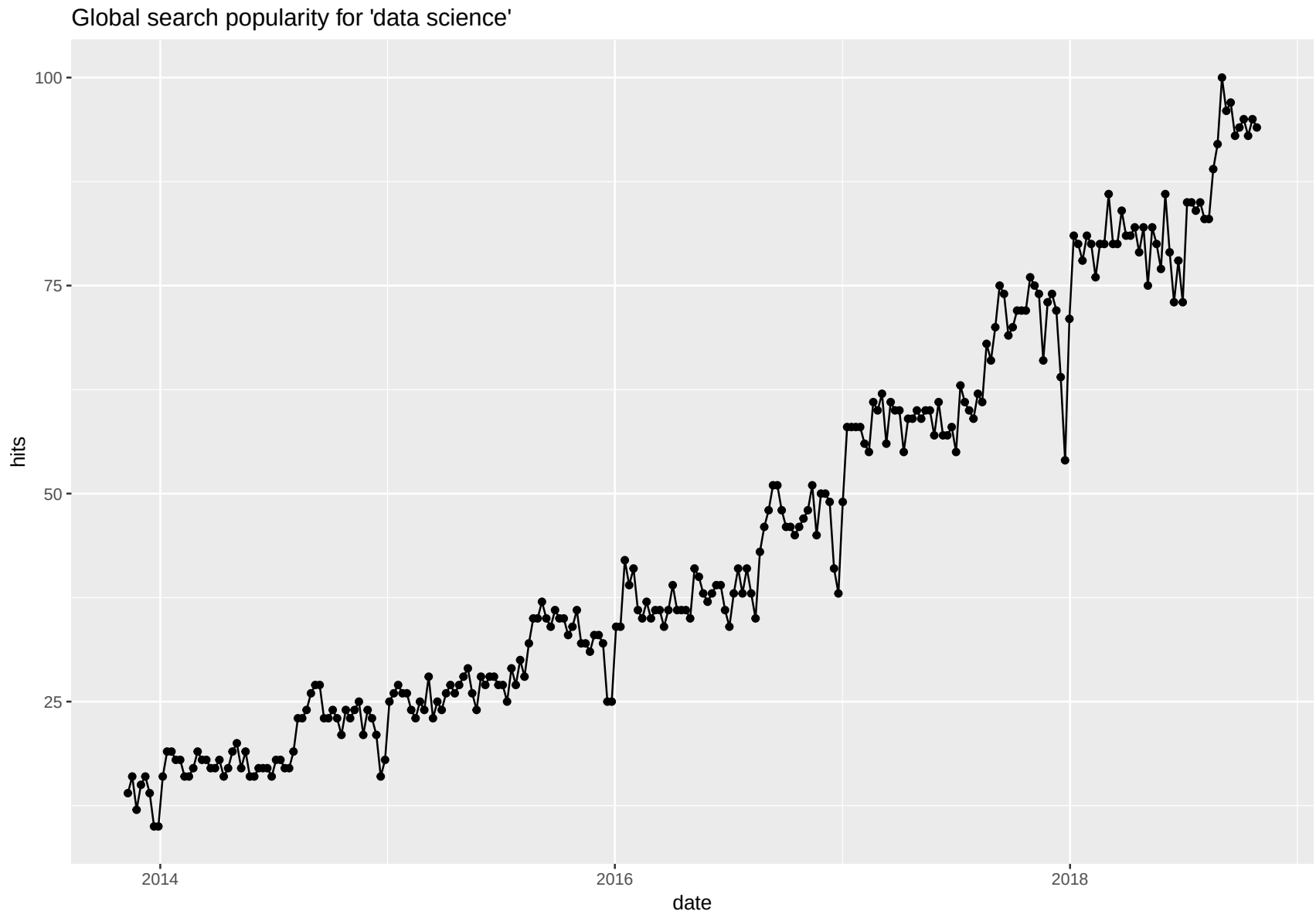
04 November, 2018

Motivation


Global search popularity for 'data science'
100
75
50
25
hits
2014
2016
2018
date

- Why we should we care?
- Yes, big data is a trend.
- But being good at computational tools and techniques has more immediate benefits.
- It can make your life **easy** and **organized**.
  - Don't repeat yourself: AUTOMATE!

- In addiiton, there are new tools for
  - Data collection (e.g., webscaping)
  - Analysis (e.g., machine learning)
  - Visualization (e.g., maps, social networks)
- In sum, you can do cool stuff.

- But it takes some **efforts** to take advantages of these new tools.
  - You need to learn how to code **a little bit**.
  - However, leanring on your own is inefficient.
  - More important, you can get bad habits.

Objectives

- Tasting a wide range of computational tools
- Getting programming fundamentals right
  - Concepts
  - Techniques
- Learning by doing
  - Learning from your own trials and erros
  - Learning from others

Hadley Wickham

@hadleywickham

Follow

The only way to write good code is to write tons of shitty code first. Feeling shame about bad code stops you from getting to good code

7:11 AM - 17 Apr 2015

909 Retweets **1,005** Likes

41 909 1.0K

- Coding is similar to **cooking**.
  - So many different cuisines (programming languages).
  - But there are fudamentals.
    - Ingredients (data)
    - Techniques (logic)
    - Recipes (workflow)

- Bad habits are **bad**.
  - Rule 1. Thou shall comment.
  - Rule 2. Thou shall reuse functions (no copy and paste).
  - Rule 3. Thou shall practice version control (no final_final_final.Rmd)

- **Learn to learn**
- Specifically, we are going to learn:
  - Navigate and operate effectively in a UNIX environment
  - Master basic Git and Github workflows
  - Write, execute, and debug R code for data cleaning, statistical analysis, data visualization and machine learning
  - Parse HTML, CSS, and Javascript for the purposes of using tools like APIs, webscraping, and Qualtrics
  - Write, execute, and debug R/Python code for text analysis, as well as other computing tasks
  - Find answers to things we won't cover in this class

- **Don't expect** you become:
  - A software programmer (we covere only a tip of the iceberg)
  - Get all the answers you need
- We focus on learning **how to learn**.

Practical examples

Private Lawyers Give Services to Agency

Publication info: Oakland Post (1968-1981) ; Oakland, Calif. [Oakland, Calif]11 Sep 1968: 22.

ProQuest document link

Abstract:

Joseph E. Smith, president of the Alameda County Bar Ass'n, and former mayor of Oakland, was the first to serve. He was in the West Oakland Service Center, 1330 Chestnut St., Aug. 27th. The other centers are: North Oakland, 905 - 55th St.; East Oakland, 8924 Holly St., Fruitvale, 1470 Fruitvale Ave., Hayward, 22531 Watkins St. and Livermore, 2222 Second St.

Links: UC-eLinks

Full text:

Alameda County lawyers are volunteering their services to the Legal Aid Society, the Society announced today. More than 75 local lawyers have responded to the Society's appeal to spend one evening per month at a neighborhood service center or contribute an equivalent amount of time in their offices.

Joseph E. Smith, president of the Alameda County Bar Ass'n, and former mayor of Oakland, was the first to serve. He was in the West Oakland Service Center, 1330 Chestnut St., Aug. 27th. The other centers are: North Oakland, 905 - 55th St.; East Oakland, 8924 Holly St., Fruitvale, 1470 Fruitvale Ave., Hayward, 22531 Watkins St. and Livermore, 2222 Second St.

Purpose of the new program is to improve the service now rendered by Legal Aid lawyers, as well as to give lawyers in private practice an opportunity to meet members of the poverty community in a professional relationship.

In addition, the time contributed helps fulfill federal requirements that 20 percent of the Society's budget be contributed from local sources. This year the federal contribution amounts to nearly $300,000 and nearly $70,000 must be raised locally.

The Legal Aid Society provides free legal service in non-criminal cases to persons who cannot afford to pay a lawyer. The Society has been instrumental in improving the administration of welfare laws, in protecting consumers from abusive sales practices and collection practices, in assisting tenants of private and public housing facilities, and served more than 8,000 clients in Oakland. It has a full-time staff of 12 lawyers in Oakland.

Ethnicity: African American/Caribbean/African

Publication title: Oakland Post (1968-1981); Oakland, Calif.

Volume: 5

Issue: 19

Pages: 22

Number of pages: 0

Publication year: 1968

Publication date: Sep 11, 1968

Publisher: Alameda Publishing Corp.

Place of publication: Oakland, Calif.

Country of publication: United States, Oakland, Calif.

Publication subject: General Interest Periodicals--United States, African American/Caribbean/African

Source type: Newspapers

Language of publication: English

- Using Excel:
  - 3 mins for copying, pasting, and reorganizing one article
  - 80,000 newspaper articles
  - Taking **4,000** hours or **166 days**

```
    for i in range(len(doc.author)):
     sum_author.append(doc.author[i].find_previous().find_previous().find_previous().find_previ
ous().text) # some articles do not have identified authors; this is a way to get around that pr
oblem

    # check

    print(len(sum_text), len(sum_date), len(sum_source), len(sum_author))
    print(sum_date[i], sum_source[i])

    # combine the results as a list

    newspaper_list = {'text': sum_text, 'date' : sum_date, 'source': sum_source, 'author':sum_a
uthor}

    # return

    import pandas as pd

    return(pd.DataFrame(newspaper_list))
```

In [ ]:
```
# get working directory

import os

os.chdir('/home/jae/Documents/Text_analysis/Data/Asian')
```

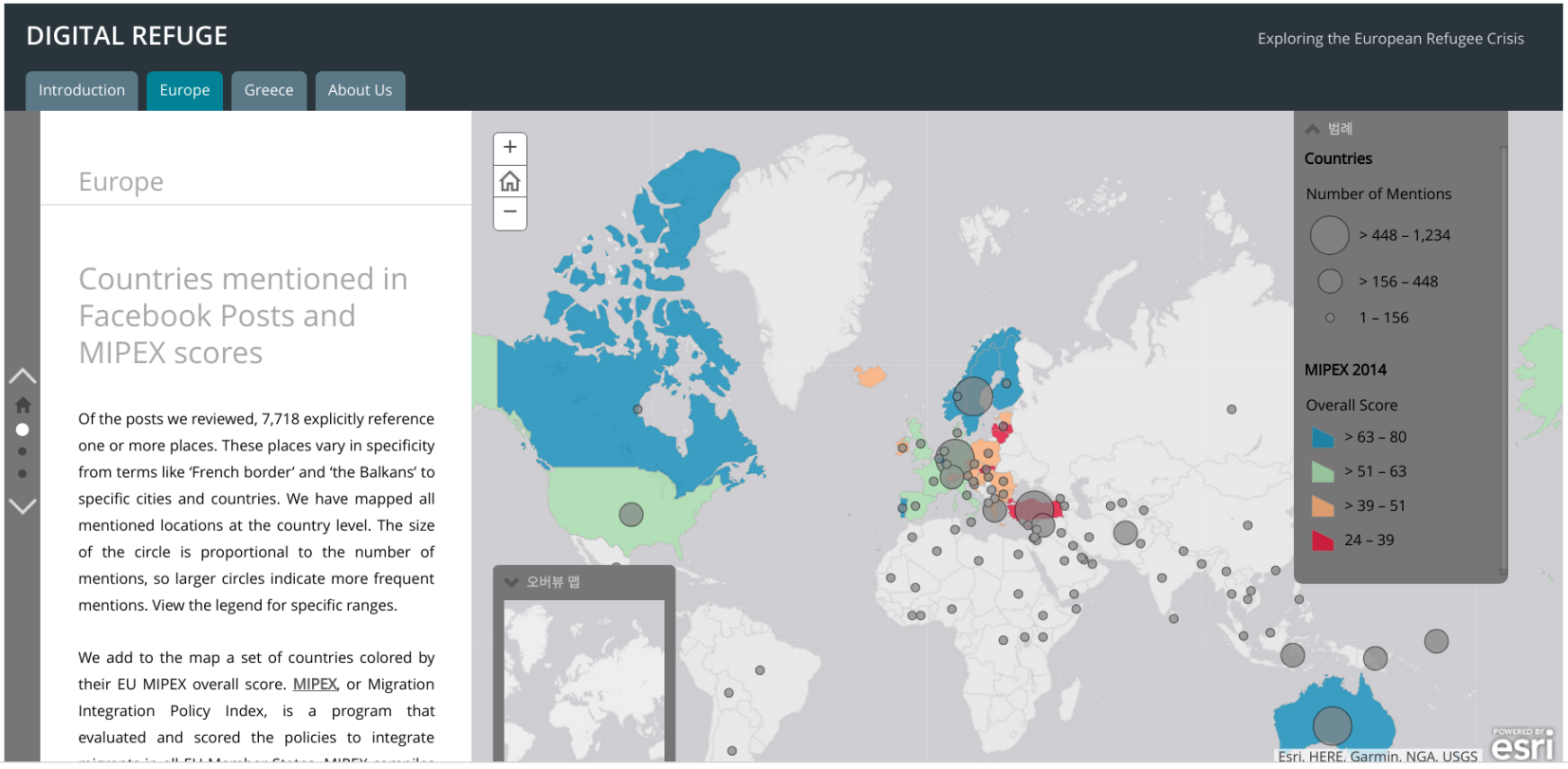
In [ ]:
```
# for loop over entire page results

n = 0

temp_dataset = []
for filename in os.listdir(os.getcwd()):
    if filename.endswith(".html"):
        n  = n + 1
        print("file",n, filename)
        temp_dataset.append(parsing_proquest(filename))
```

```
file 1 w1t1page80.html
100 100 100 100
Publication date: Jun 27, 1986 Publisher: Asian Week
file 2 w1t1page26.html
100 100 100 100
Publication date: Aug 25, 1983 Publisher: Asian Week
file 3 w1t2page15.html
100 100 100 100
Publication date: Oct 2, 1987 Publisher: Asian Week
file 4 w1t1page9.html
100 100 100 100
```

Previous final projects by students



Focus on best practice.

- Good habits are **good**.
  - Commenting serves you and many other people.
  - Reusing functions provides opportunities to learn and clean up your mess.
  - Practicing version control is how we become a mature researcher and a coder.
    - Being a professional requires constant revision of your work.

Class

- Participation (25%)
  - Be kind and nice to each other. We're all leanring (especially me).
- Homework (50%)
  - Every week.
  - Learning how to code is like learning how to drive.
- Final project (25%)
  - Feasibility is your friend. Late Feb proposal, April presentations.

Logistics

- Learning by doing
- Pair-programming on in-class challenges
- Section is required.
- Julia Christensen is a technical assistant to the course.

Special thanks

- Rochelle Terman (University of Chicago)
- Rachel Bernhard (University of Oxford, UC Davis)