Programming Language Instruction in Libraries

Lorin Bruckner (UNC)

Amanda Henley (UNC)

Joel Herndon (Duke)

Jeremiah Trinidad-Christensen (Columbia)

Programming Language Instruction in Libraries

Research Data Services, Columbia University Libraries

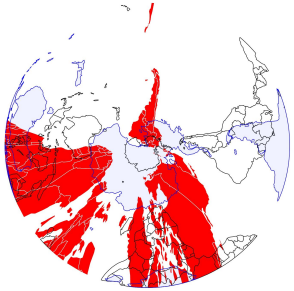
Jeremiah Trinidad-Christensen
jt2118@columbia.edu

Map Club!

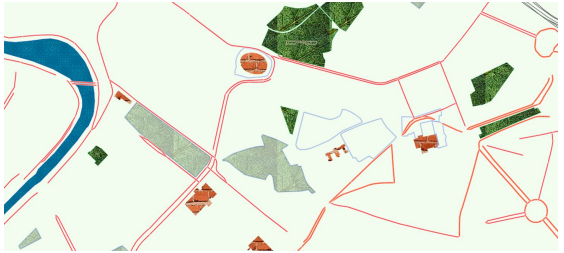
- Introduced Fall 2016
- Rapid prototyping
- Tackle something new each time
- Loosely structured
- Mostly JavaScript

Tools introduced

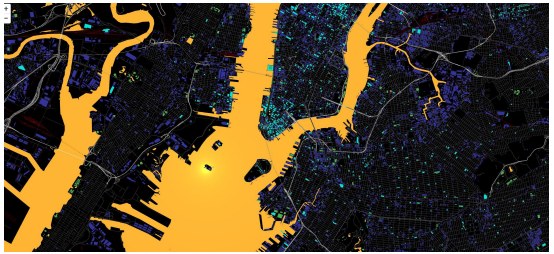
- Tangram
- Leaflet
- D3
- geojson.io
- Cartagen



D3



Cartagen



Tangram

Open Labs for R & Python

Why?

- Frustration from students & staff
  - Matching question to the right person
- Community building
- Needed alternative to workshop model

Open Lab format

What?

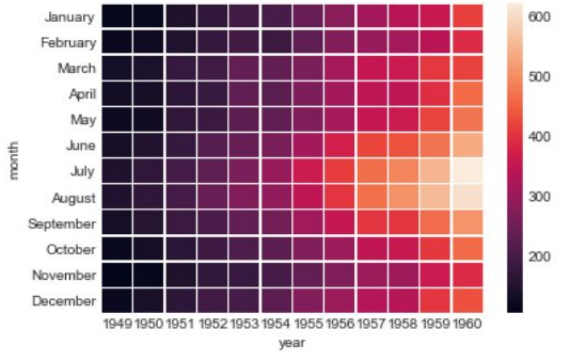
- Semi-structured format
  - 10-30 minute talk
- Modular, not built from previous session
- Intern led, part of the Digital Center Internship Program
- Starter kits for new users

```
In [147]: # load in flights dataset
          flights = seaborn.load_dataset("flights")

In [148]: # print first five rows
          flights.head()

Out[148]:    year     month  passengers
          0  1949   January         112
          1  1949  February         118
          2  1949     March         132
          3  1949     April         129
          4  1949       May         121

In [149]: # print last five rows
          flights.tail()

Out[149]:     year      month  passengers
          139  1960     August         606
          140  1960  September         508
          141  1960    October         461
          142  1960   November         390
          143  1960   December         432

In [150]: flights = flights.pivot("month", "year", "passengers")
          # draw border
          x = seaborn.heatmap(flights, linewidths=0.3)
```

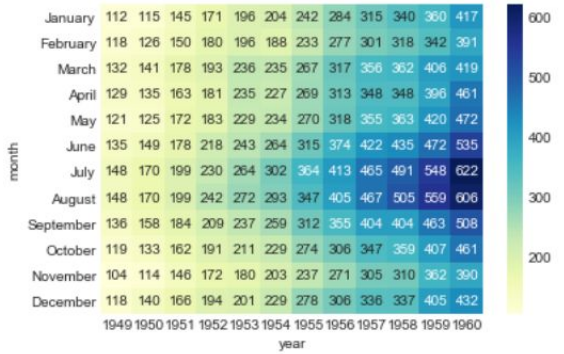
Different needs

- R taught in different schools & departments
- Tied to curriculum

- Python not supported in the same way, but a strong demand for learning
- More structured, sessions tied more closely together




```
[152]: # change color and add value
       x = seaborn.heatmap(flights, annot=True, fmt="d", cmap="YlGnBu")
```



Takeaways

- Community building is tough!
- Takes time onboarding interns
- Need better communication with teaching faculty
- Assessment

Programming Pathways

University of North Carolina at Chapel Hill

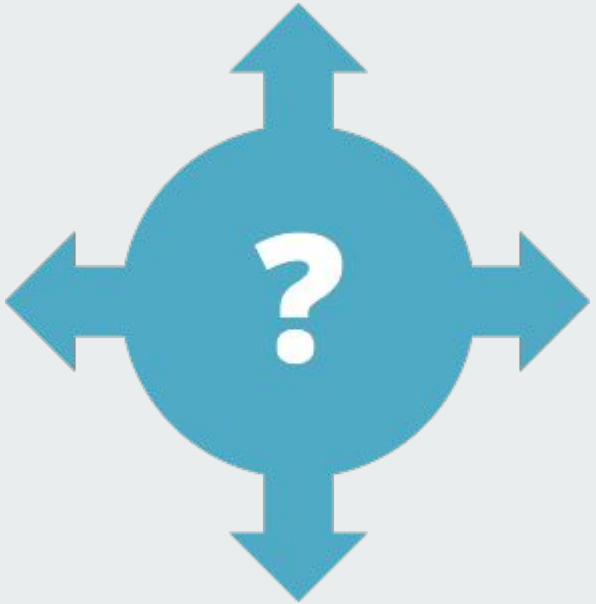
Lorin Bruckner
lorin.bruckner@unc.edu

Amanda Henley
amanda.henley@unc.edu

Research Hub
Welcome
to the Research Hub at Davis Library
• GIS
• Data Services
• Text Mining
• Data Visualization
• Digital Humanities

Different Instruction Models

- Traditional standalone short courses
- Bootcamp/intensive style “Data Wrangling” event
- Columbia University Library’s Open Labs



Why Open Labs?

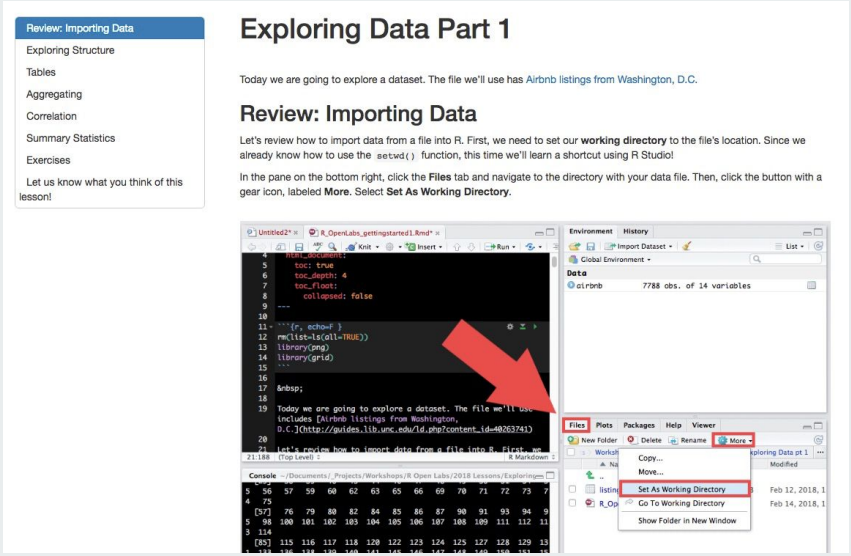
- Learning R takes time and practice
- Inspired by Columbia's success with the model
- Previous success expanding GIS learning communities in the past
- Collaboration with the Odum Institute

RESEARCH HUB @ Davis Library

THE ODUM INSTITUTE
FOR RESEARCH IN SOCIAL SCIENCE

Our Implementation

- Brief instruction followed by lab time
- Exercises are provided
- Lessons available online using R Markdown
  ropenlabs.web.unc.edu
- Pilot: Badging



Exercises

Note: If you are completing exercises to obtain a badge, please *show your work* instead of providing just the answers.

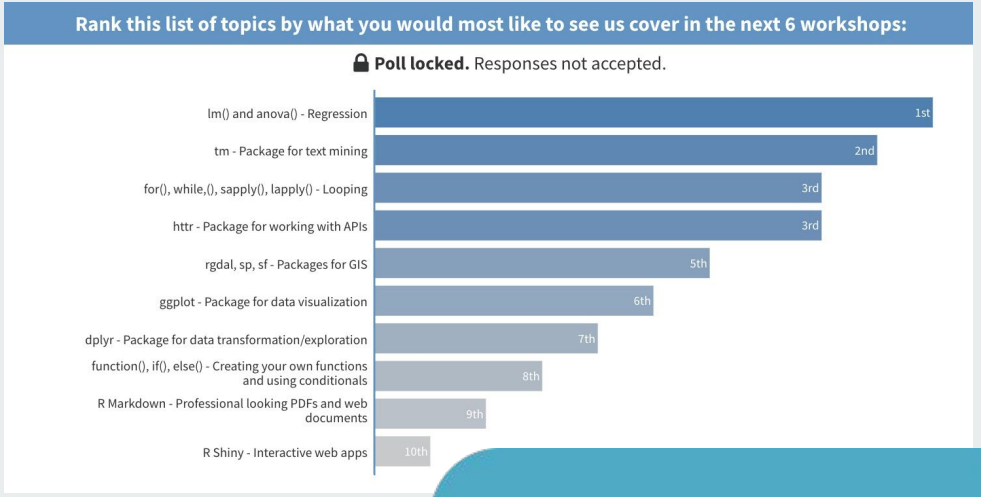
1. What are the different types of cancellation policies offered at Airbnb?
2. What is the most common and least common cancellation policy?
3. What percent of Airbnb property types are houses? *Hint: To find what percent of X is Y, use this formula: Y/X * 100*
4. How many listings get a review rating below 50?
5. What is the maximum number of people that can be accomodated at each property type? *Hint: For* `aggregate()`*, we can look at other statistics than just the mean. Another option is "max" which gives us the highest value at each level.*

What Worked

- Huge initial attendance
- Transitioned to a dedicated core group
- Diverse group of participants, from undergrads to faculty
- Corpus of instruction material, data

Assessment

- Feedback surveys
- Attendance data
- Voting
- (Future) focus groups



"I love these labs.. "

"Thanks guys, this was helpful. I have zero knowledge in R but now, I am getting excited about R.. "

What We're Still Figuring Out

- Encouraging collaboration
- Helping latecomers catch up
- Reducing prep time
- Managing beginners' sophisticated goals
- Teaching trial and error

Ideas/Next Steps

- Adjust format to encourage collaboration
- Alternative types of exercises
- Outsource materials
- Stick to the basics
- Increase outreach to faculty

New Frontiers in Services

Embracing code and building community @ Duke Libraries

Joel Herndon
joel.herndon@duke.edu
Twitter: @jherndon

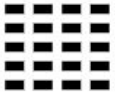
Data and Visualization Services

Data and Visualization Services Department

http://library.duke.edu/data

askdata@duke.edu

SUPPORT AREAS


Data Sources

Data Management

Data Cleaning

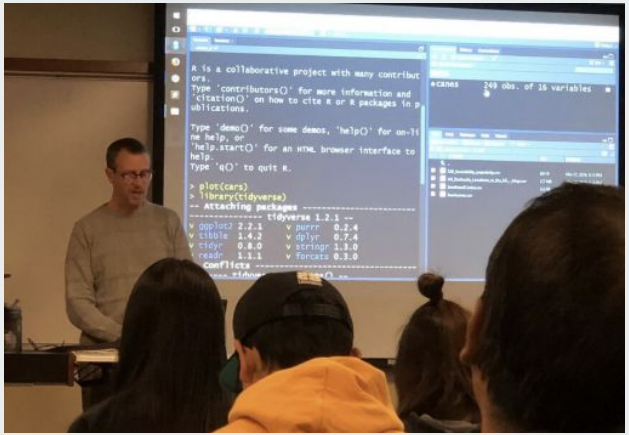
Data Analysis

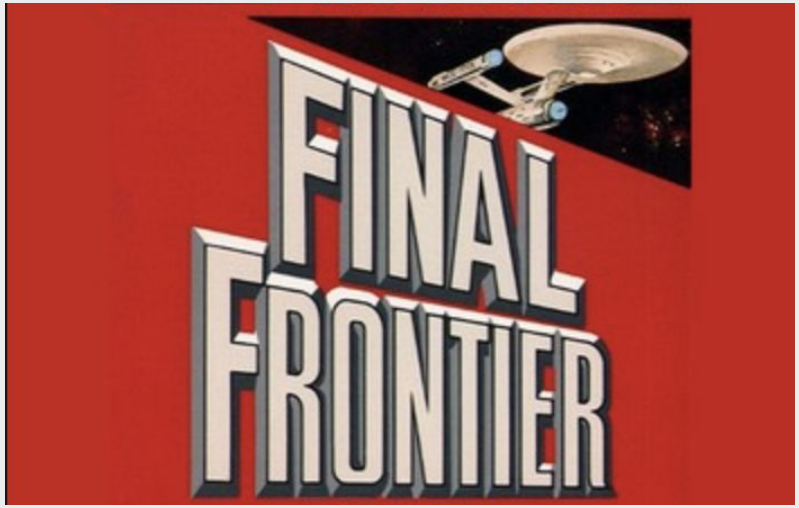
Mapping and GIS

Data Visualization

DVS Workshops Spring 2018

January to April 2018

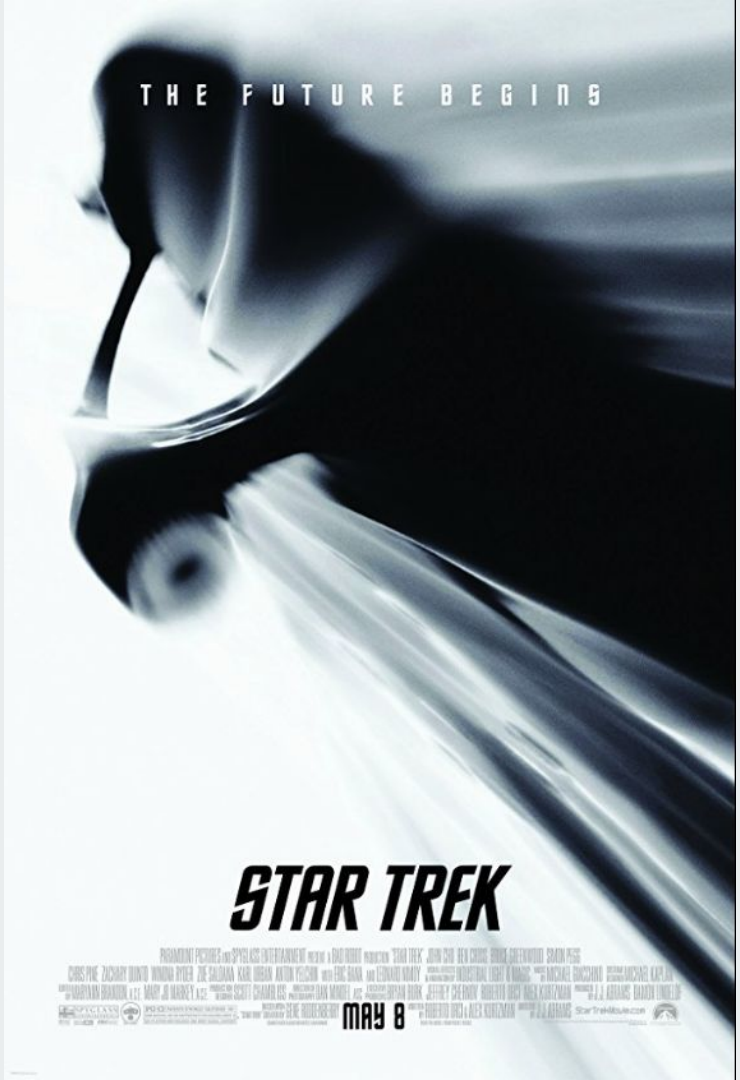




← R + python™

Early Instruction

- High demand
- Varying expectations
- Focused on syntax / data structures



Reboot

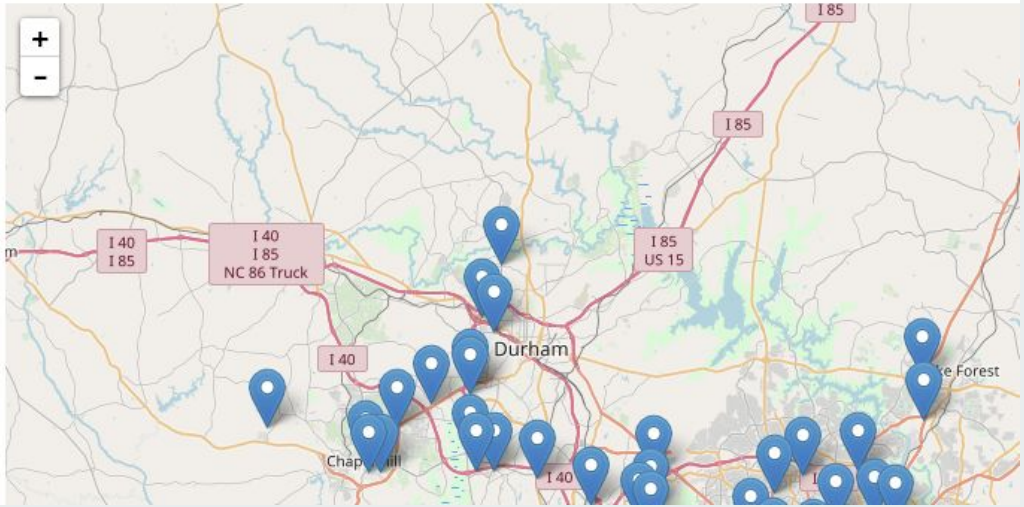
Interactive

- Less syntax
- More hands-on
- Intuitive examples

Plot Lat and Lon on a Map

Using the `leaflet` function, plot the latitude and longitude on a basemap. Latitude is *Y*, Longitude is *X*.

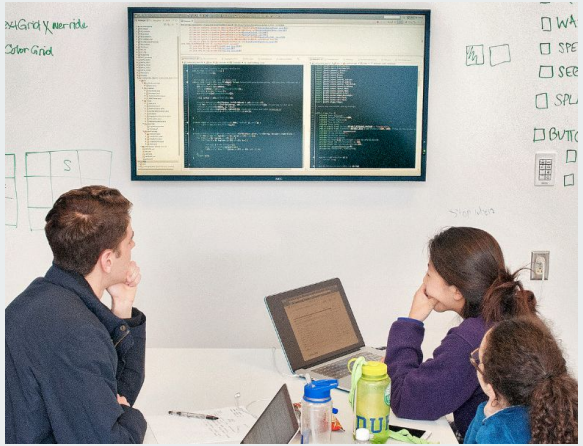
```
starbucksNC %>%
  leaflet(width = "100%") %>%
  addTiles() %>%
  setView(-78.8310, 35.9867, zoom = 10) %>%
  addMarkers(lat = ~Latitude,
             lng = ~Longitude,
             popup = starbucksNC$Name)
```



Reproducible

- Embed data management
- Illustrate best practices

Community Focus



DVS Workshops Spring 2018

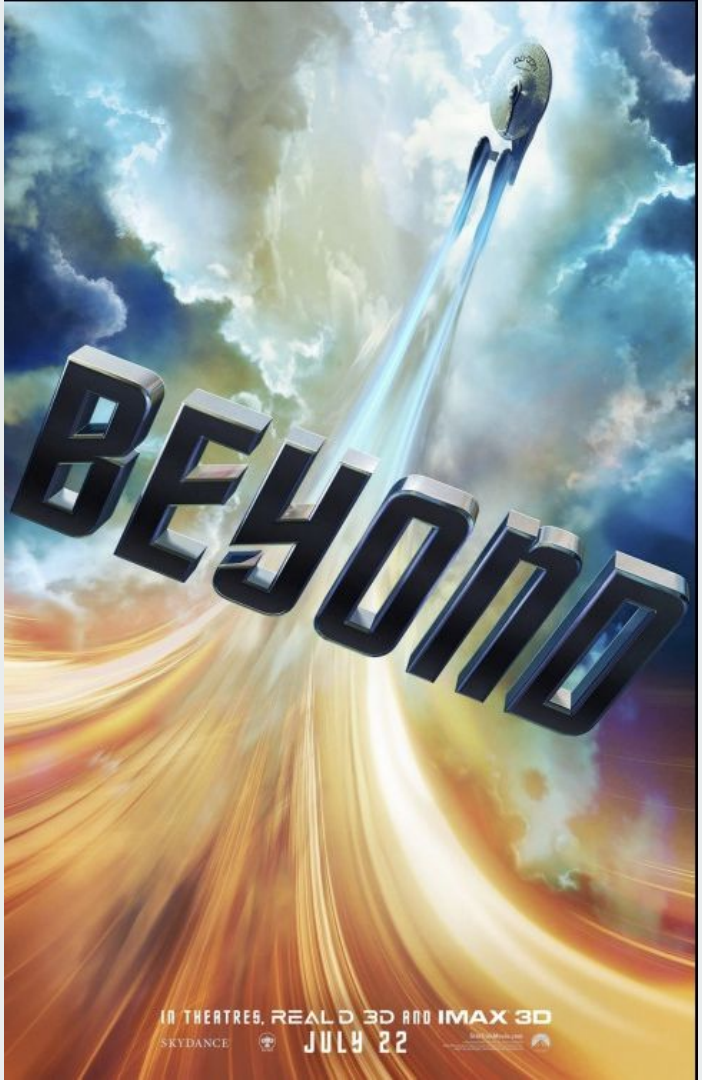
R Workshop Series

Intro to R
Data Management, Git, & RStudio
Visualization in R with ggplot2
Mapping with R
R Markdown
Shiny

rfun.library.duke.edu

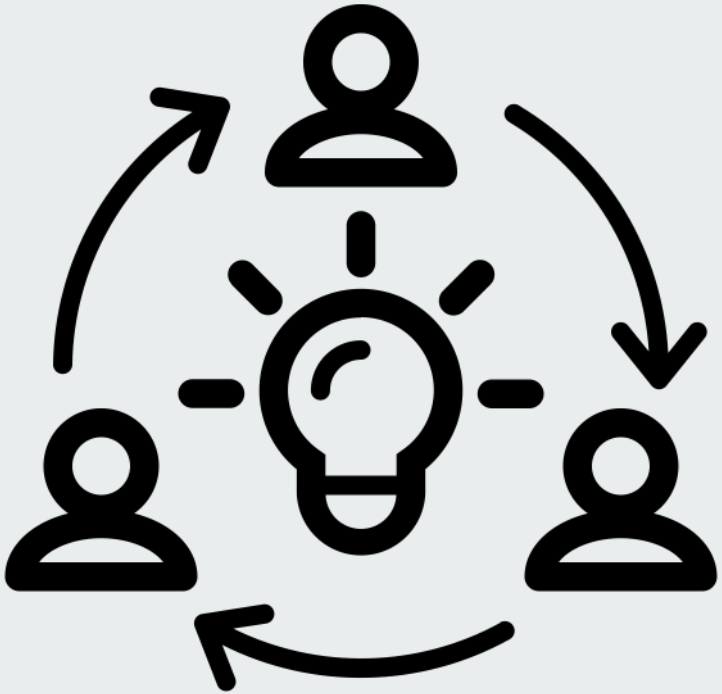
R WE HAVING FUN YET?

A LEARNING SERIES ON [R]. HOSTED BY DATA & VISUALIZATION SERVICES -- DUKE UNIVERSITY LIBRARIES



Lessons Learned

Iterate



Created by Weltenraser
from Noun Project

Simplify

Created by Chris Homan
from Noun Project

Partner

DUKE · UNC · NCSU ASA DATA FEST

DataCamp

Ladies RTP

Questions?

Joel Herndon
Email: joel.herndon@duke.edu
Twitter: @jherndon

Resources:
RFUN: rfun.library.duke.edu
DVS Workshops: library.duke.edu/data/workshops/past-workshops