R Workshop – April 23, 2024

Introductions to rmarkdown, tidycensus, and leaflet

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Do I need to have R downloaded? Where can I find files for this presentation?

- It's recommended to have RStudio downloaded for this workshop, but it's not necessary.
  - RStudio is the user-friendly interface for running R, saving programs, and much more
  - Alternatively, you can use RStudio online in posit's cloud
    - Go to https://posit.cloud
    - Click "get started"
    - Choose a plan (I like "free"), click "learn more"
    - Sign up!
    - In the upper right, click the drop down for "New Project" → "New RStudio Project".
- It would be helpful to have the files pulled up from my GitHub page: https://github.com/CharlotteLoobyRTI/IFDTC24
  - There's also a link to this in this morning's email from Kevin

Who is this workshop for, anyway?

- People who…
  - …don't know any R
  - …know some R
  - …create documents
  - …use Census or American Community Survey data
  - …like playing with maps

Topics

- Using rmarkdown to knit publish-ready documents
- Using tidycensus to access ACS and Census data and corresponding shape files
- Using leaflet to create maps

Some notes about R

- Open source statistical programming language
- Case-sensitive
- Reads in packages
- Use install.packages(“packagename”) prior to loading with library()

A quick note about tidyverse

- tidycensus uses tidyverse packages

R packages for data science

The tidyverse is an opinionated **collection of R packages** designed for data science. All packages share an underlying design philosophy, grammar, and data structures.

Install the complete tidyverse with:

```
install.packages("tidyverse")
```

Why use rmarkdown?

- See your code and its results side-by-side in the .Rmd program
- Knit your code chunks together—including text, tables, plots, etc.—to render PDF, MS Word, HTML, or MS PowerPoint files.
- Create interactive documents that contain htmlwidgets or Shiny components.
- Create dashboards, websites, and more
- Examples: https://rmarkdown.rstudio.com/gallery.html

tidycensus

- Accesses a few of the Census Bureau's data APIs
  - American Community Survey
  - Decennial Census
- Variables able to be used found using load_variables()
- Geography available, useful for mapping
- Request a Census API key: https://api.census.gov/data/key_signup.html

Exercise 1

- Knit an HTML document that produces a table of median income of each Ohio county, by ascending median income
  - In the lookup_ACS dataset, look for “median income” (hint: variables with “PR” in the name only apply to Puerto Rico)

Making interactive maps with leaflet

- Use shape files and lat/longs to make maps
- Add layers like tiles, markers, popups, etc.
- Interactive features zooming, clusters, and the like

Exercise 2

- Create a map of Ohio counties, with color indicating median income (use program started for Exercise 1, add on to it)
  - Recommend pulling from ACS API again to include geometry just for the graph. Kable doesn't like creating tables with geometries in them.
  - If using RStudio on PC, knit
  - If using RStudio in the posit cloud, don't knit

References

- rmarkdown
  - Website: https://rmarkdown.rstudio.com/
  - Cheat sheet: https://posit.co/blog/the-r-markdown-cheat-sheet/
- tidycensus
  - Website: https://walker-data.com/tidycensus/
  - Basic usage: https://walker-data.com/tidycensus/articles/basic-usage.html
- leaflet: https://rstudio.github.io/leaflet/
- RColorBrewer
  - Color palettes: https://r-graph-gallery.com/38-rcolorbrewers-palettes.html
  - Different types of custom palettes: https://rstudio.github.io/leaflet/articles/colors.html
- R Graph Gallery book (intro to data visualization in R): https://bookdown.org/content/b298e479-b1ab-49fa-b83d-a57c2b034d49/

Thank you

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