GESIS Leibniz Institute for the Social Sciences

Reproducible Research in Action: A Hands-On Binder Tutorial

Leibniz Association

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From Theory to Practice: Bringing Reproducibility to Life

- **You've Heard About:**
  - Open Science & computational reproducibility
  - Computational Environments (Jupyter, Docker, repo2docker)
  - Binder Hub
- **Today's Goal:**
  - **Launch & Interact** with fully reproducible R & Python analyses via Binder.
  - Understand the **ease and power** of sharing executable research.

Launch Your Reproducible Environment!

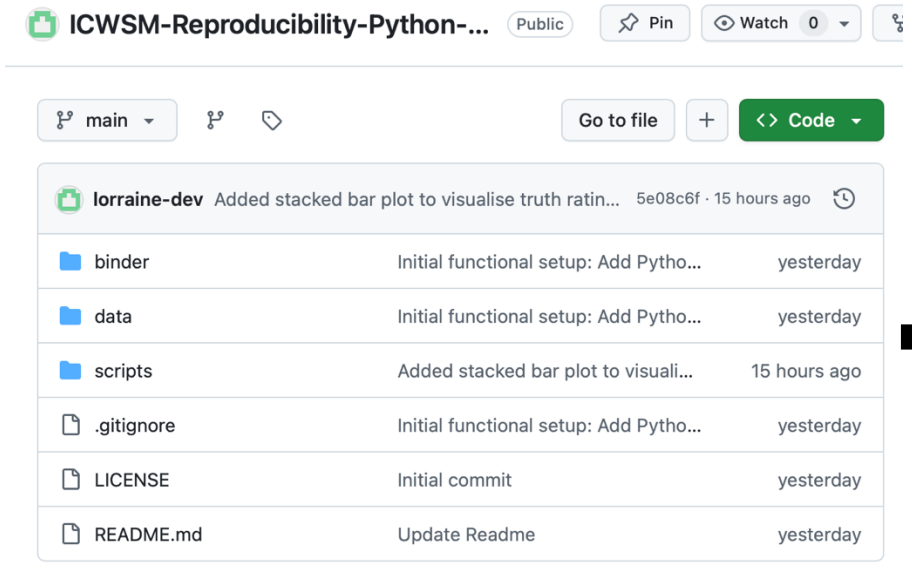
Python Demo

https://tinyurl.com/8xv63xw7

R demo

https://tinyurl.com/845y7a3s

Binder: Your Reproducible Research Bridge

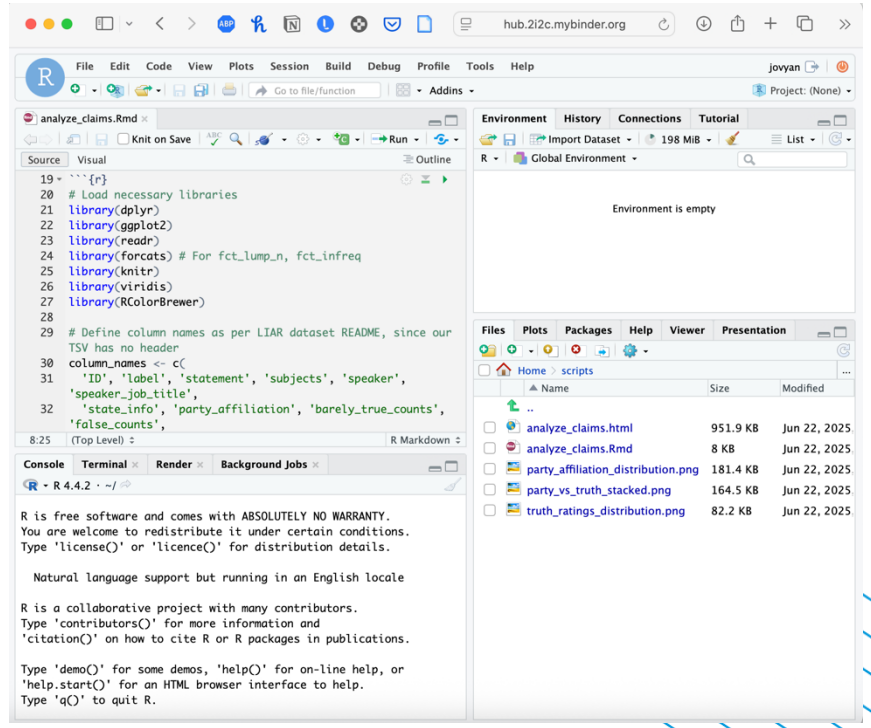


Your Code + Config Files (e.g., install.R, requirements.txt)

binder

Turn a Git repo into a collection of interactive notebooks

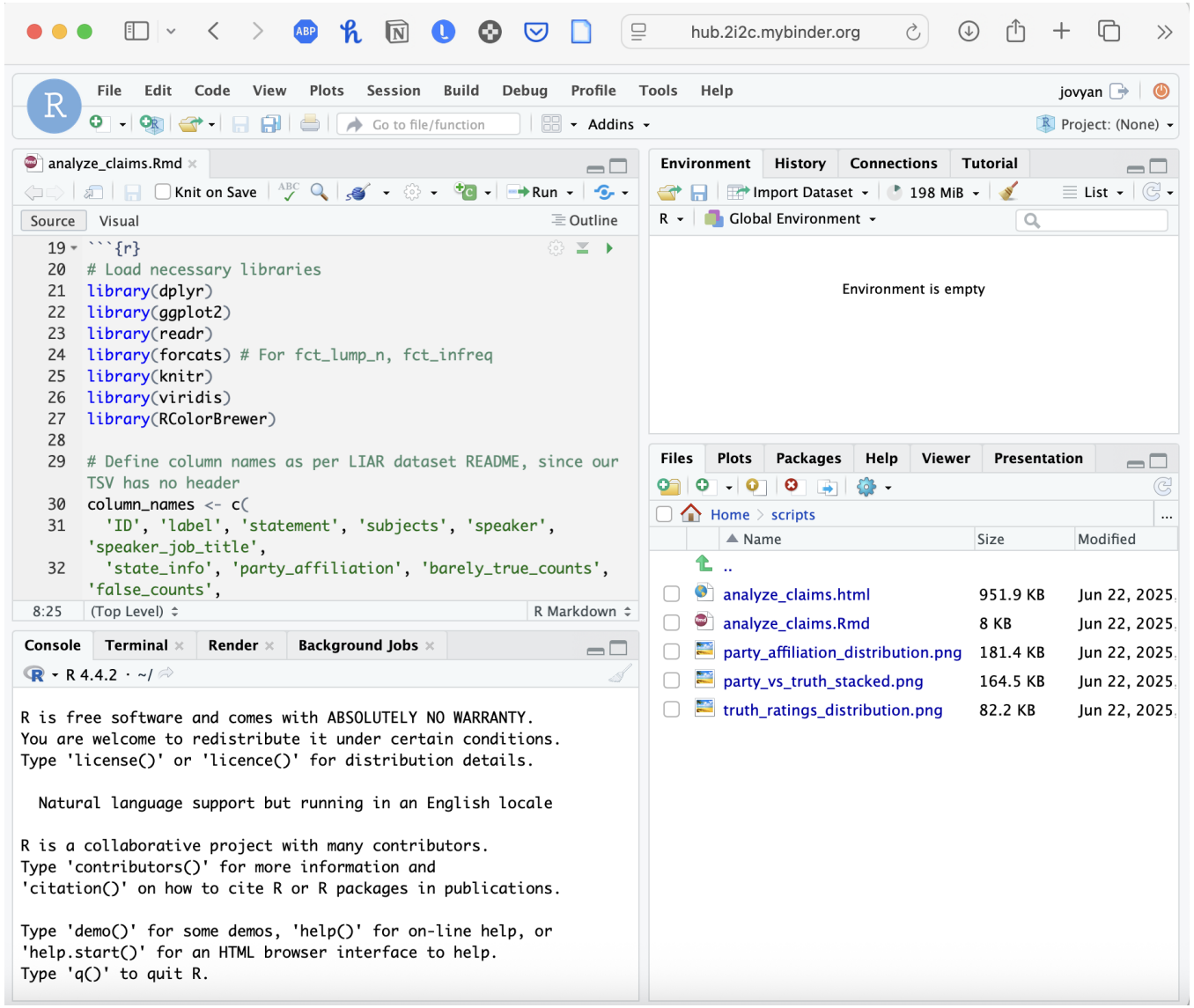
Binder Hub (builds Docker image with repo2docker)



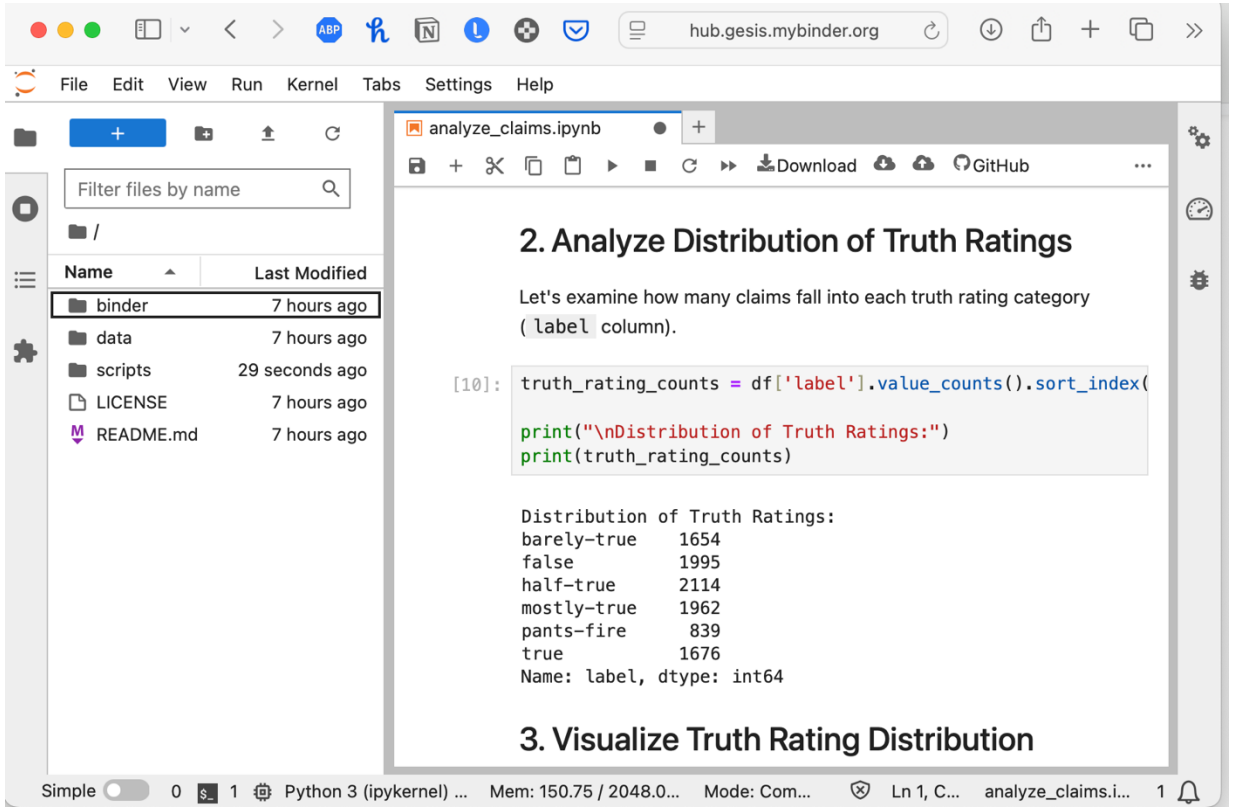
Live, Interactive Environment (RStudio / JupyterLab)

Result: Zero setup, shareable, executable research for anyone, anywhere.

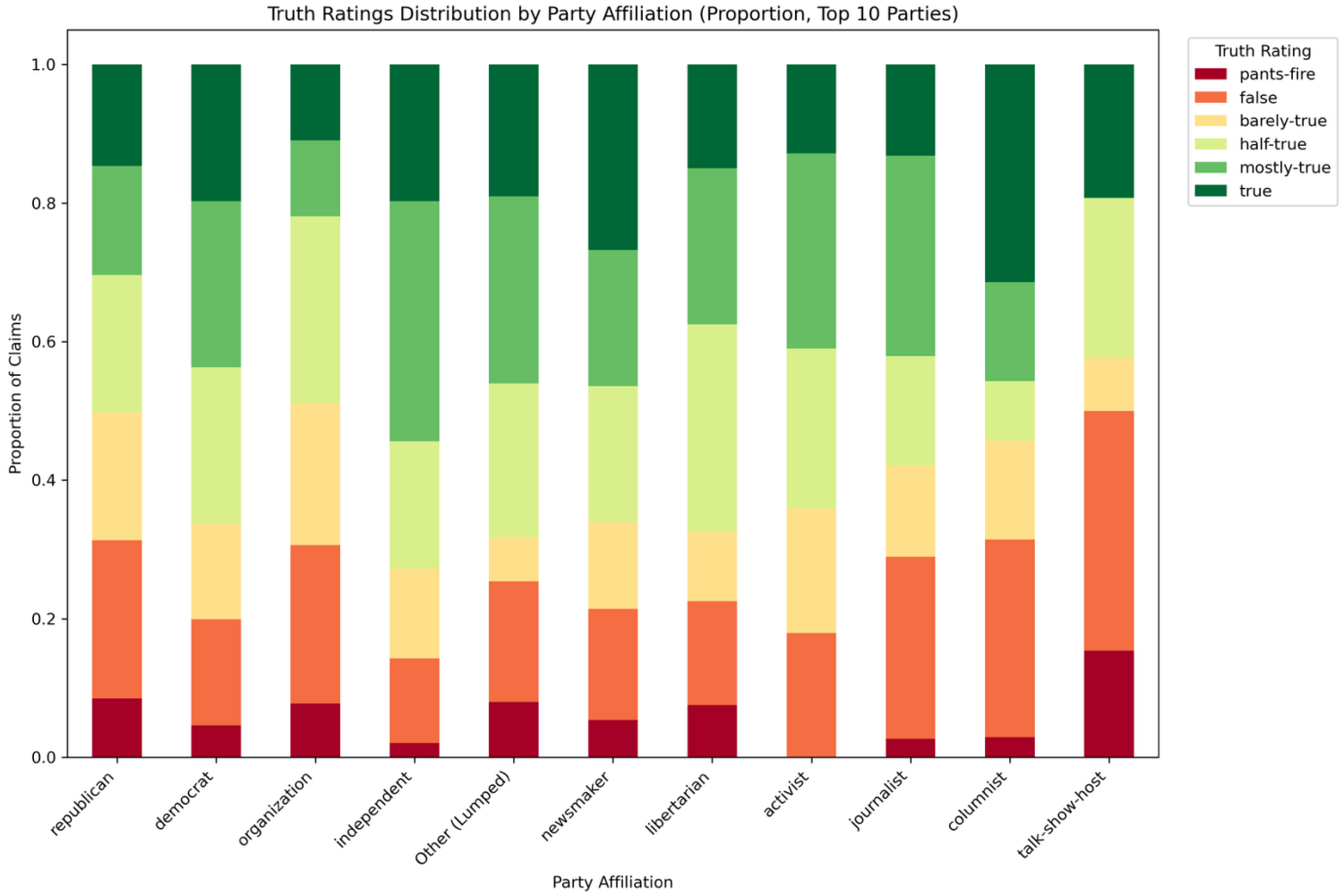
R Demo: Inside the remote Rstudio instance



Python Demo: Unpacking Politician Claims in JupyterLab



Python Demo: Politician Claims Analysis Walkthrough



Key Takeaways: Reproducibility at Your Fingertips

- **Binder's Power:**
  - **Zero Setup:** No local installations needed.
  - **Interactive:** Run, modify, explore code live.
  - **Reproducible:** Ensures consistent results across environments.
  - **Shareable:** A single link to your executable research.
- **Impact for Research:**
  - Increases transparency & trust
  - Accelerates collaboration
  - Lowers barriers to engagement

Your Next Steps: Binderize Your Own Project!

Steps	Python	R
1. Organise your code: Clear folders, meaningful names, use of relative paths.	-	-
2. Define environment: Document language version List external libraries	Python version -> runtime.txt Dependencies: requirements.txt (e.g., pandas==2.0.3) (or environment.yml for Conda)	sessionInfo() -> runtime.txt Dependencies: install.R (e.g, install.packages("tidyverse"))
3. Push to **GitHub** and make your repo public		
4. Go to **mybinder.org** and paste your repository URL		
5. Copy your binder badge		

Further Resources

- **Explore Our Demos:**
  - https://tinyurl.com/8xv63xw7
  - https://tinyurl.com/845y7a3s
- **Learn More:**
  - mybinder.org (Official Binder site)
  - **repo2docker Documentation:**
    - General: repo2docker.readthedocs.io/en/latest/
    - Configuration Files: repo2docker.readthedocs.io/en/latest/config_files.html
  - The Turing Way (Guide to Reproducible Research)
  - BERD Reproducible Research Course: berd-nfdi.github.io/BERD-reproducible-research-course/

Thank You For Your Attention

Questions?

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