# WEB-BASED TOOLS FOR DATA ANALYSIS: JUPYTERLAB ENVIRONMENT AND WORKFLOW OPTIMIZATION

*M Portela, November 3, 2020*

**The material is available in GitHub**

https://github.com/reisportela/R_Training

## 1. Operating system

- Linux (e.g., Ubuntu 20.04), OSX Catalina, Windows 10

## 2. Packages

**Windows**: consider installing Chocolatey, a package manager for Windows (similar to `yum` in CentOS or `brew` in OSX)

- Python: install Anaconda – https://www.anaconda.com

  **Example, using Chocolatey**: `choco install anaconda3`

  or download and install

- **R**: https://www.r-project.org
- **Julia**: https://julialang.org
- **Stata**: https://www.stata.com

  Recomendation: install RStudio

## 3. Jupyter

> "The Jupyter Notebook is an open-source web application that allows you to **create and share** documents that contain *live code*, equations, visualizations and **narrative text**. Uses include: data cleaning and transformation, numerical simulation, statistical modeling, data visualization, machine learning, and much more."

### 3.1 Install jupyter

- Open a Terminal in either Linux or OSX
- Open Windows Powershell as Administrator

Run the following lines

- **jupyter notebook**: *pip install notebook* or *conda install -c conda-forge notebook*

- **jupyter lab**: *pip install jupyterlab* or *conda install -c conda-forge jupyterlab*

### 3.2 Install your kernels

- **Python**: this should be the first one installed ipykernel
- **R**: irkernel

  Open an R console, e.g. within RStudio, and execute sequentially, *install.packages('IRkernel')*, *IRkernel::installspec()*

  Add `Node.js` and `npm`

  Visit Nodejs.org

- **Julia**: IJulia

  Run Julia and execute sequentially, *using Pkg*, *Pkg.add("IJulia")*

- **Stata**: stata_kernel

  Detailed installation by Kyle Barron

  Magics – "Magics are programs provided by stata_kernel that enhance the experience of working with Stata in Jupyter."

### 3.3 Start 'notebook' or 'lab'

- **jupyter notebook**: *jupyter notebook*
- **jupyter lab**: *jupyter lab*

### 3.4 Remove a Kernel

```
jupyter kernelspec list
```

```
jupyter kernelspec uninstall unwanted-kernel
```

## 4. Binder

Running R Projects in MyBinder – Dockerfile Creation With Holepunch

- myBinder
- Gesis Notebooks
- Check the following link on "Configuration Files"

apt.txt - Install packages with apt-get

### Examples using the GitHub 'reisportela/prjs'

- Check this example with RStudio & R 3.6 exercise
- or a setup where we can build a notebook with Python 3.0 or R (you can also run RStudio from this link)


Even better, use GESIS notebooks to launch your image

The concept

## 5. A gallery of interesting Jupyter Notebooks

- Gallery
- Plotting and Programming in Python
- Exploratory data analysis in Python

## 6. Books

- Python Data Science Handbook
- Bookdown
- How to Hide all the code cells in Jupyter Notebook Python with single Click

## 7. Checks

- Binder examples
- Binder Multi-language demo
- mybinder.io

## 8. SoS NOTEBOOK

- Local installation

### pip installation

pip3 install sos

pip3 install sos-pbs

pip3 install sos-notebook

pip3 install sos-papermill

pip3 install sos-r

pip3 install sos-julia

pip3 install sos-stata

python3 -m sos_notebook.install

jupyter kernelspec list

jupyter notebook

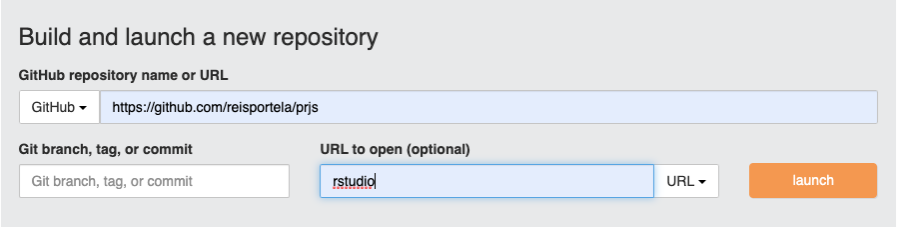
# 9. Discussion on Julia

- use an environment julia-python
- a multi-language-demo
- Using Julia in Binder: interactive web environment for running your code

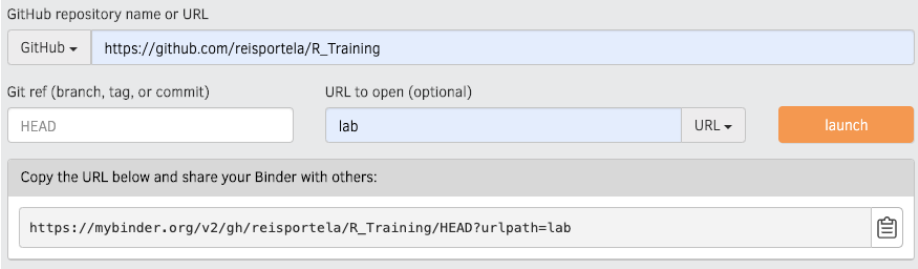
By default I will not activate a machine running Python, R and Julia as it takes too long to build the image. I recomend using the link.

# 10. GESIS Notebooks

- Create a login in GESIS Notebooks and add your machine (running RStudio)




or a **Jupyter Lab**




**mybinder** allows you to create a linked icon to your interactive notebook


# 11. Further notes

## 11.1 Jupyter's extensions

*conda install -c conda-forge jupyter_contrib_nbextensions*

*jupyter contrib nbextension install –user*

## 11.2 Kaggle Kernels

Kaggle

## 11.3

How to Hide all the code cells in Jupyter Notebook Python with single Click

## 11.4 Pandas

Pandas cookbook

## R and Dropbox

rdrop2

# 12. Usefull links

Binder

CODE OCEAN

GESIS Notebooks

Hypernet Labs

IBM Skills Network Lab

RStudio Cloud