DSBA 5122: Visual Analytics

Class 14: Python

Ryan Wesslen

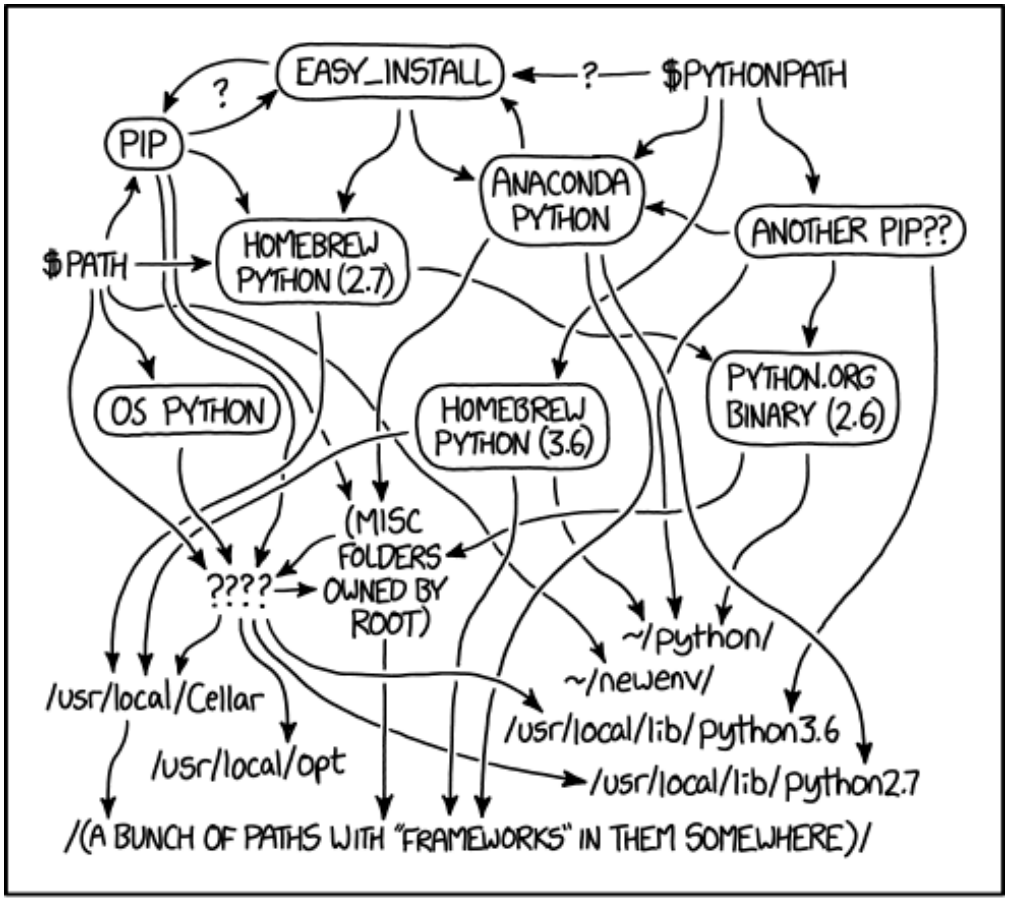
December 2, 2019

Python+R (reticulate)

Reticulate is an R package for connecting to an existing python distribution (e.g., Anaconda, virtual environment).

````
29
30 ```{r}
31 library(tidyverse)
32 flights <- read_csv("flights.csv") %>%
33   filter(dest == "ORD") %>%
34   select(carrier, dep_delay, arr_delay) %>%
35   na.omit()
36 ```
37
38 ```{python}
39 print(r.flights.head())
40 ```
41
````

Python Configurations



MY PYTHON ENVIRONMENT HAS BECOME SO DEGRADED
THAT MY LAPTOP HAS BEEN DECLARED A SUPERFUND SITE.

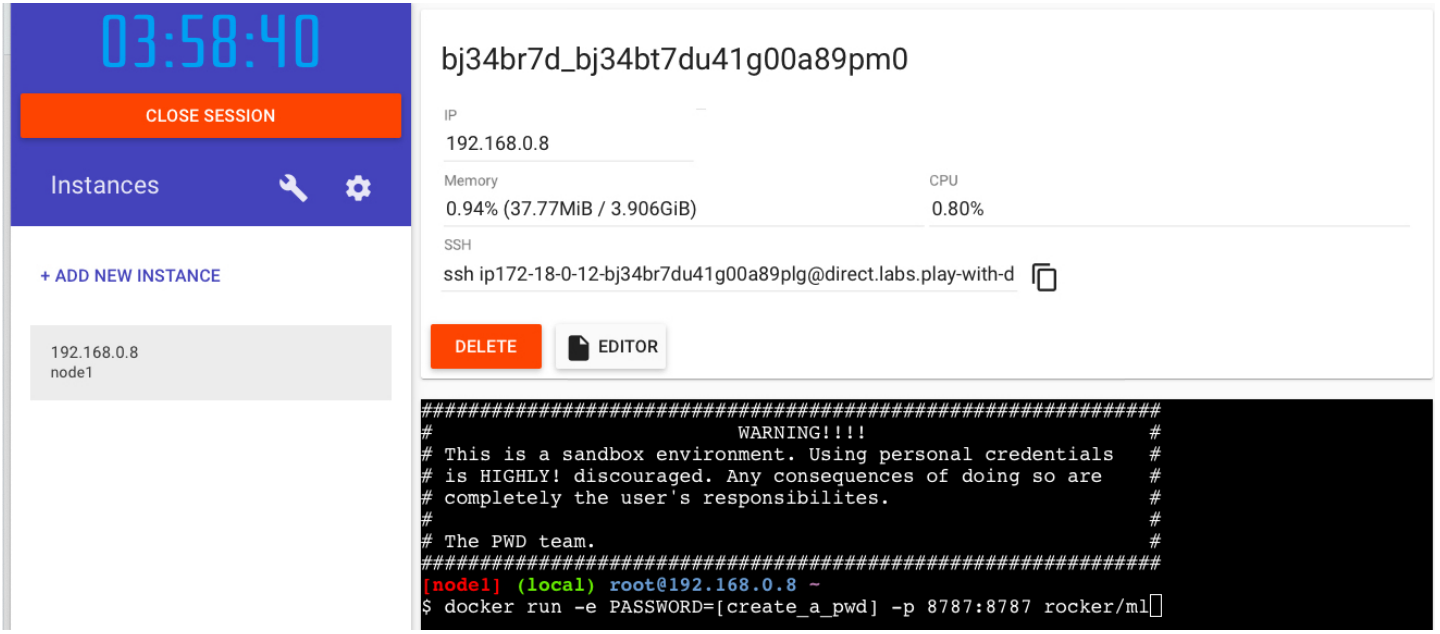
1. Run RStudio's ML Docker Image in one of these ways:

1. Easiest option (free, no local install): play-with-docker
2. Will take time to install (free): local Docker
3. Will cost money: Digital Ocean Droplet

This docker image also includes Machine Learning packages (for CPU) like h2o, tensorflow, and keras. It can expand to GPU environments too!

Play-with-docker.com

```
# run in bash command/terminal
docker run -e PASSWORD=[create_a_pwd] -p 8787:8787 rocker/ml
```



3. Open RStudio via port 8787

You can do this by clicking the "Open Port" button and then typing in 8787.

FYI: username: rstudio, pwd: whatever you chose

4. Importing python packages

```
# run in RStudio console/file
# fyi reticulate is prepackaged
library(reticulate)
os <- import("os")
os$listdir(".")
```

5. Installing python packages

- Run this in RStudio *terminal*:

```
#run in rstudio terminal
easy_install pip
easy_install virtualenv
```

- Restart RStudio session (Session > Restart R)

- Run this in RStudio *console*:

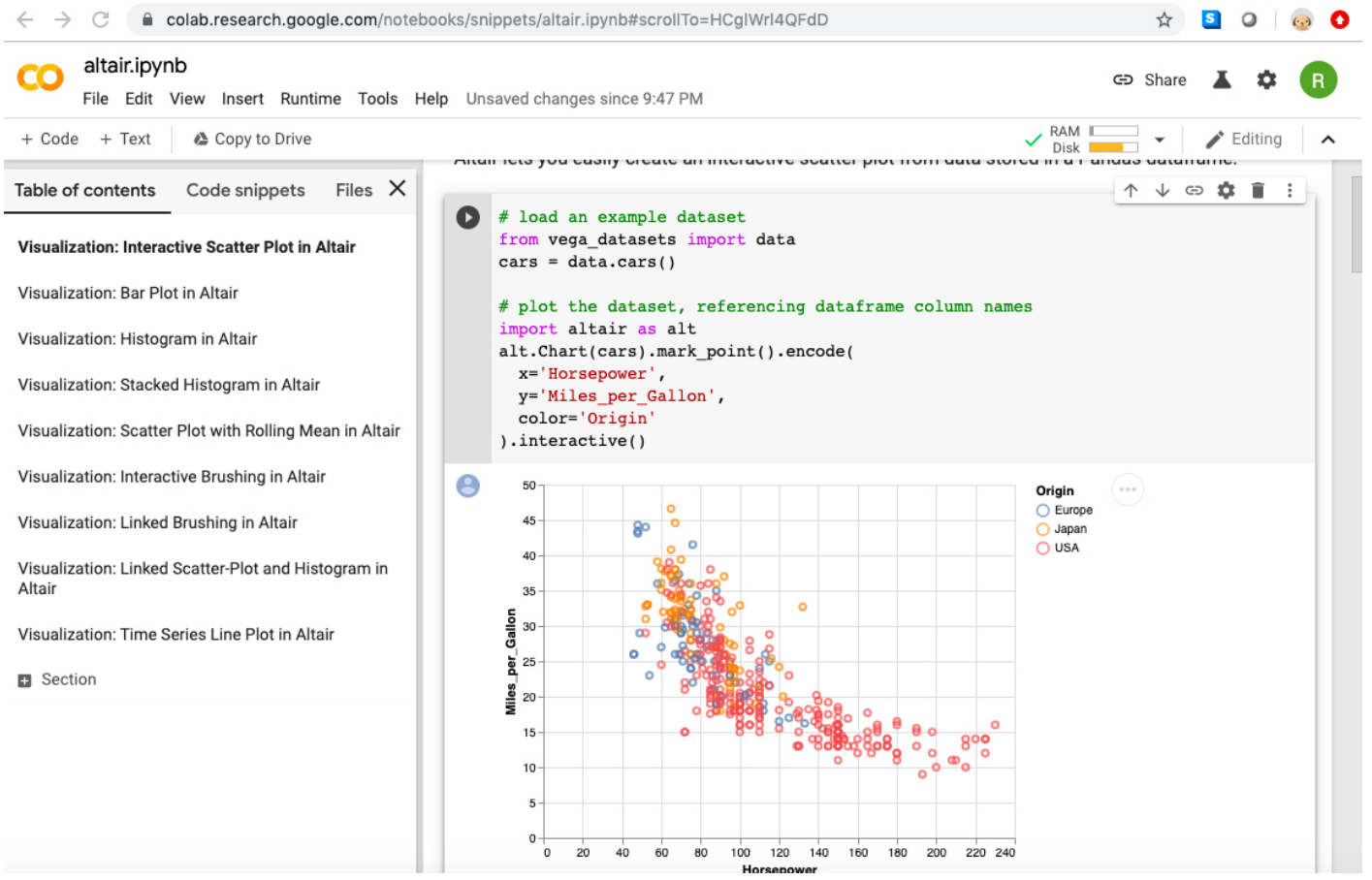
```
#run in rstudio console
reticulate::py_install("pandas")
```

- Run this to install a demo MNIST model:

```
#run in rstudio console
download.file("https://gist.github.com/wesslen/aec5666a3a29238dd651eccf1425ae20",
              destfile = "mnist-keras.R")
```

Colab Notebooks

https://colab.research.google.com/



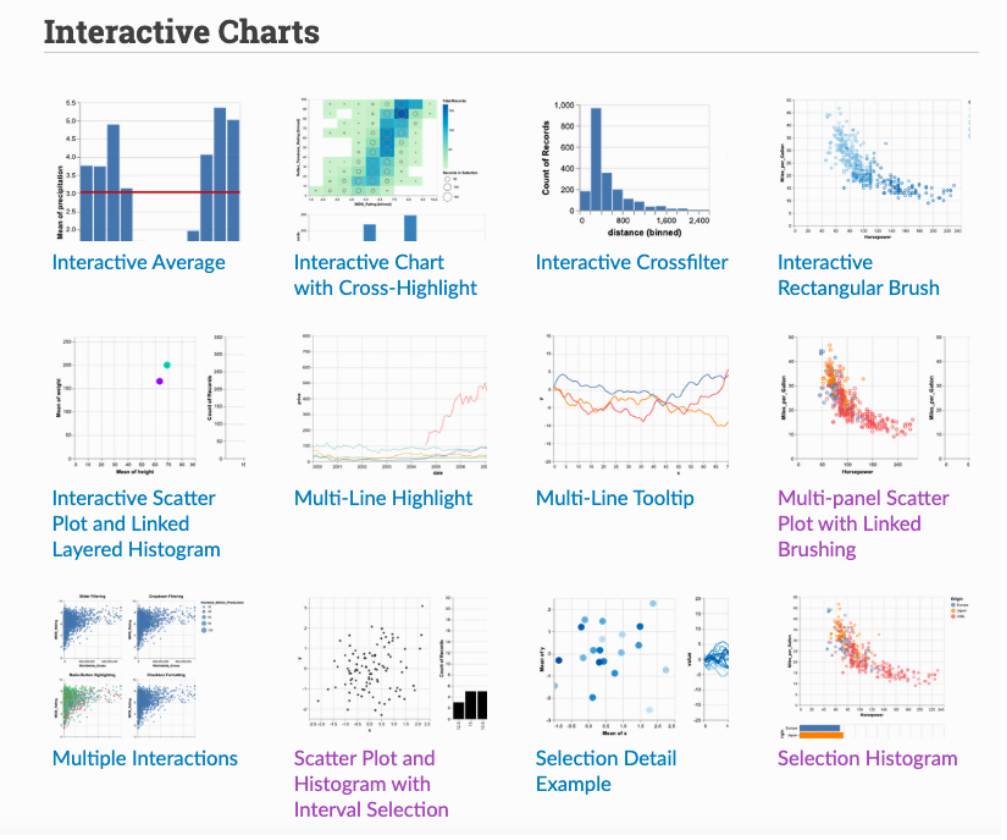
Think of it as RStudio.Cloud for Python. Even has GPU's!

Altair: An Interactive Grammar of Graphics

Altair is a python package for Vega/Vega-Lite, which are an interactive grammar of graphics. What is that?

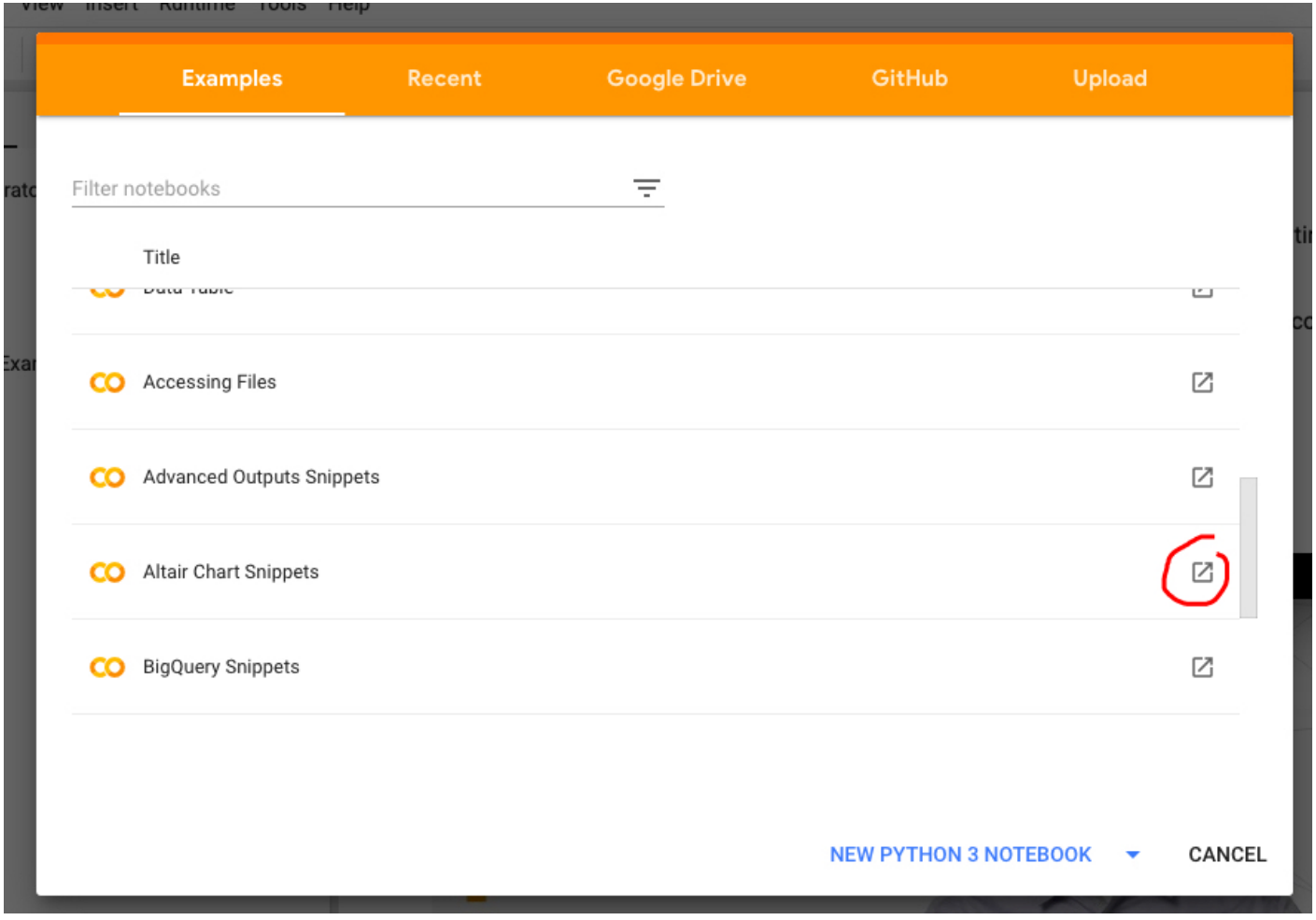
Jake VanderPlas' Altair Tutorial at PyCon 2018

https://altair-viz.github.io/gallery/index.html



Altair Gallery

How to run Altair via a Colab Notebook



Run Multiple Tutorials

- Go to "GitHub" tab. In the URL, paste "https://github.com/altair-viz/altair-tutorial.git" then press Return (or Enter)
- Change Repository to "altair-viz/altair_tutorials"
- Open Notebooks

Can change to other Repositories like "altair-viz/altair_notebooks"

Links

1. Docker training
2. Altair tutorial jupyter notebooks and video
3. Yihui's thoughts on R-Python notebooks
4. Python `reticulate` configuration
5. RStudio `reticulate` cheatsheet