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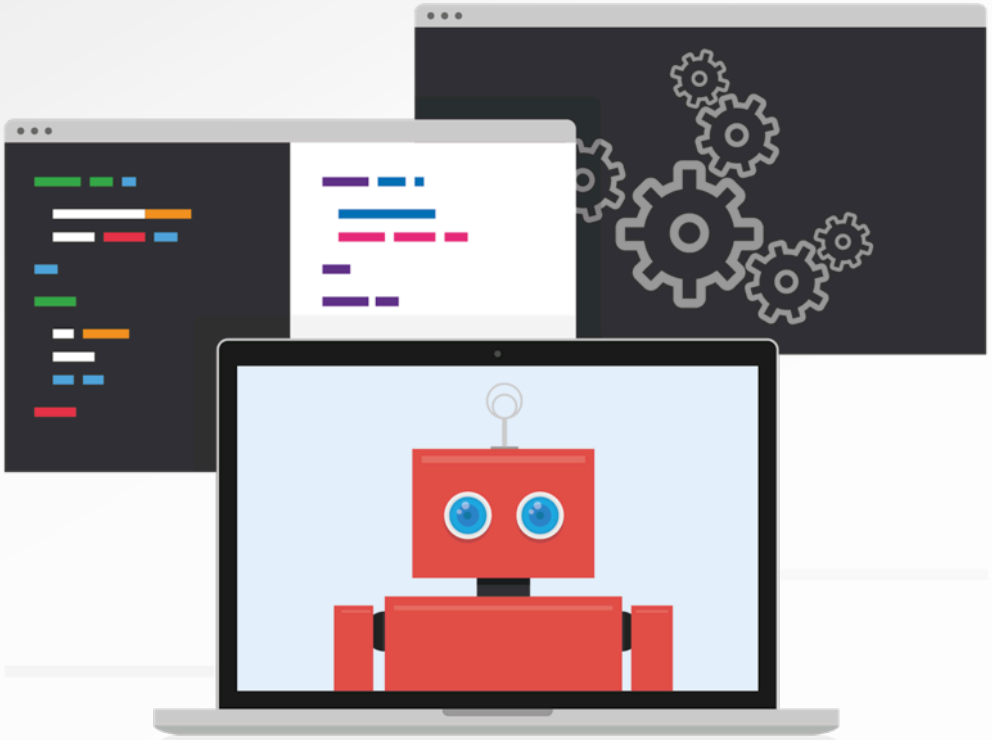
Exploratory data analysis & interactive figures with Plotly



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Agenda

- EDA - When to use it and why?
- The dataset and our tool belt
- Basics in plotting and data summarizing
- Hands-on coding session

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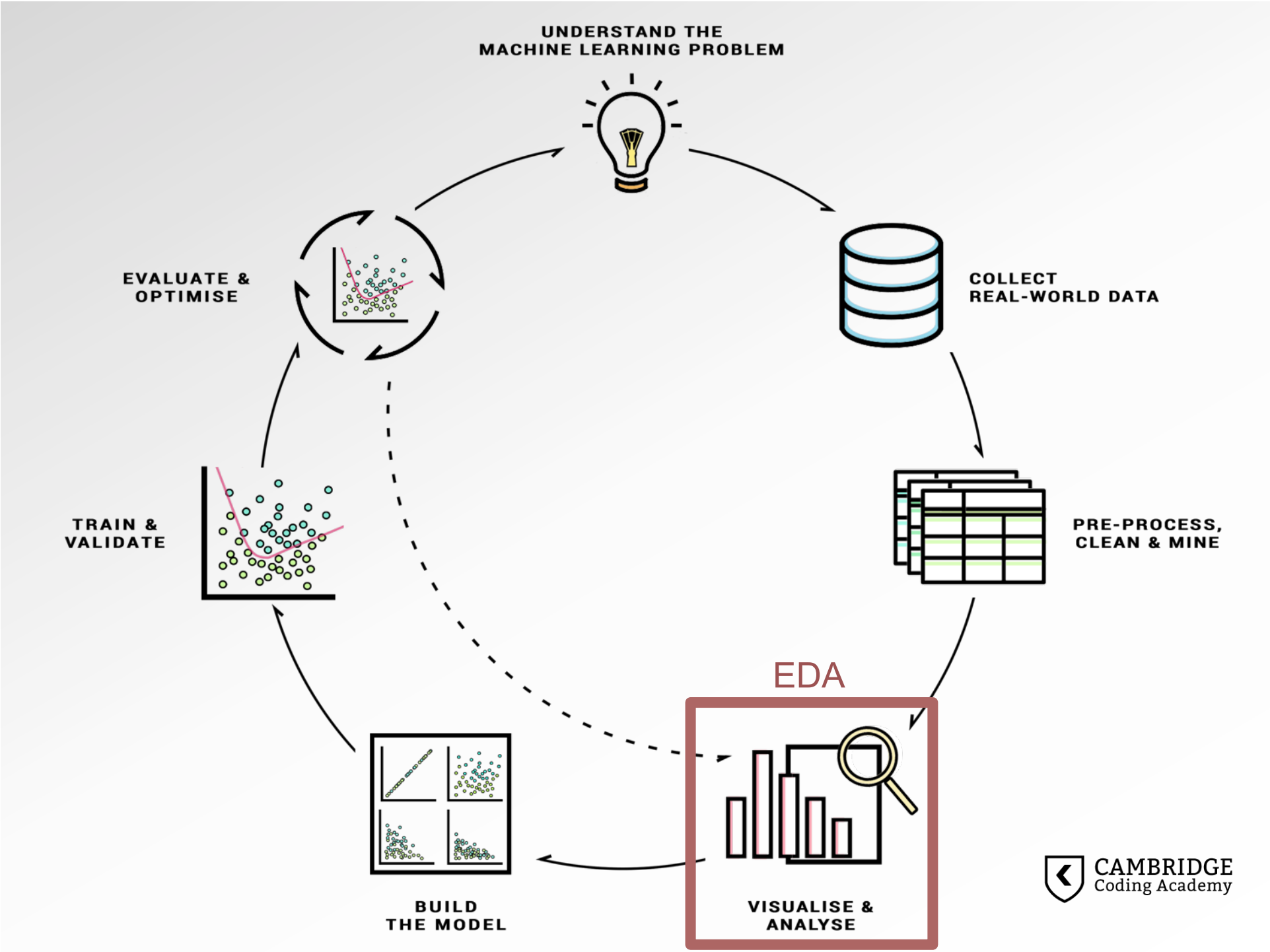
UNDERSTAND THE
MACHINE LEARNING PROBLEM
COLLECT
REAL-WORLD DATA
PRE-PROCESS,
CLEAN & MINE
EDA
VISUALISE &
ANALYSE
BUILD
THE MODEL
TRAIN &
VALIDATE
EVALUATE &
OPTIMISE
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Online Platform

http://online.cambridgecoding.com/

Interested in a two-day data science bootcamp using Python?

Check out our upcoming bootcamp on 02-03 July in London

http://cambridgecoding.com/datascience-bootcamp

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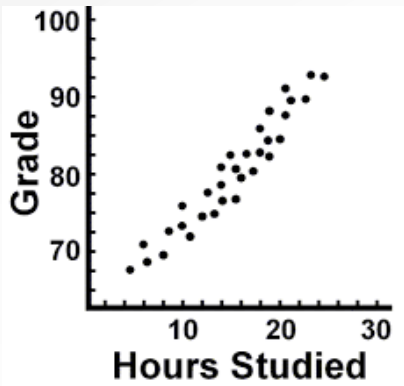
What is EDA?

Friend	Number of hours of studying per week	Grade Point Average (out of 5.0)
Allie	14	3.91
Samantha	42	4.98
Hayley	10	3.22
Jessica	32	4.81
Megan	5	2.0
Rachel	10	2.82
Briley	25	3.79
Lauren	18	3.48



- Mapping data to visual object to make it relatable and understandable
- Goes hand in hand with statistics and machine learning
- Communicate your decision to somebody efficiently

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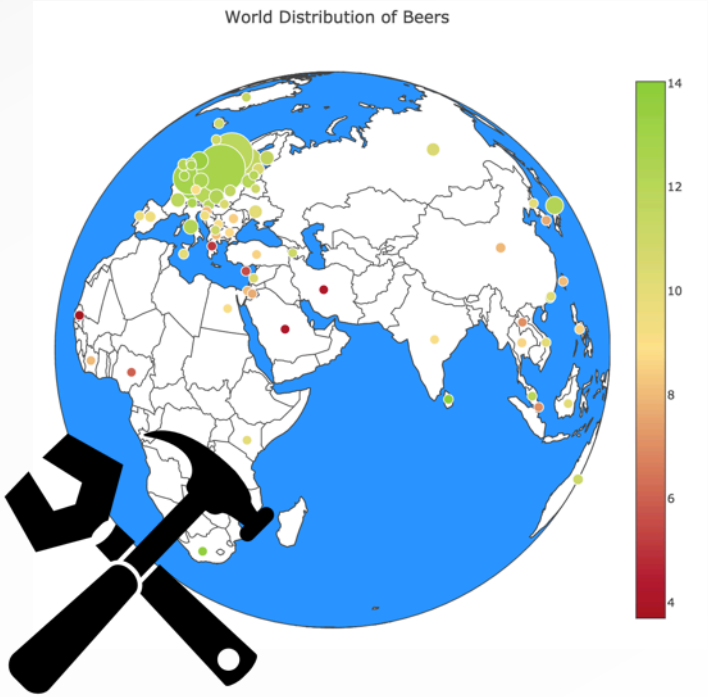
The Dataset

What country in the world produces the most and the best beer?

http://www.cambridgebeerfestival.com/



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Our EDA setup

Python

Tool belt

plotting

data processing

Coding environment

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What is Plotly

https://plot.ly/

- Produce interactive graphics
- Share with plots with people (if registered)
- Integrates with other frameworks (R, Python…)
- Easy to pick up
- Many different plots types available

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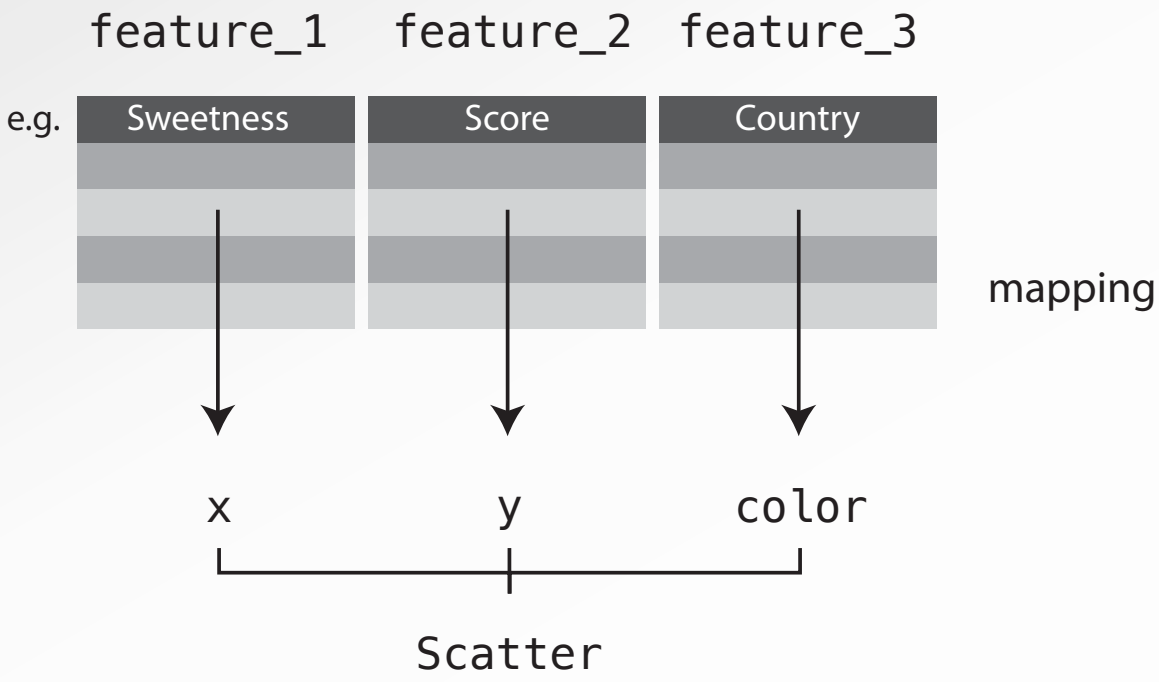
Plotting basics

1. collect data



3. map to aesthetics

2. pick a geometry

```
trace = go.Scatter(x = feature_1 , y = feature_2, color = feature_3)
```

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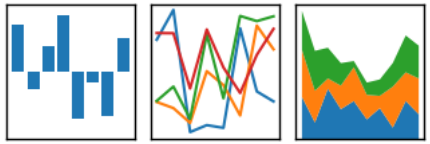
What is Pandas

pandas

$y_{it} = \beta' x_{it} + \mu_i + \epsilon_{it}$



http://pandas.pydata.org/

- Convenient data analysis in python
- Easy to read in data
- Reshaping of and preprocessing data
- Filtering data
- Calculate summary statistics

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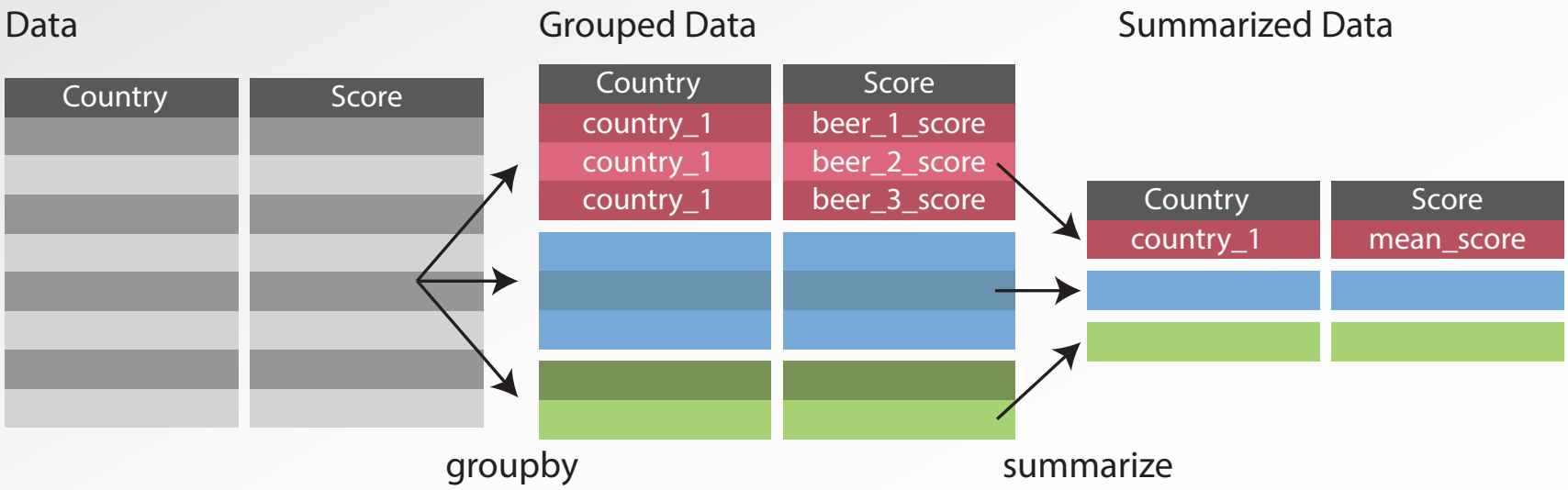
Basics of data processing

- Break process up into steps




```
dataset['Score'].groupby(dataset['Country']).mean()
```

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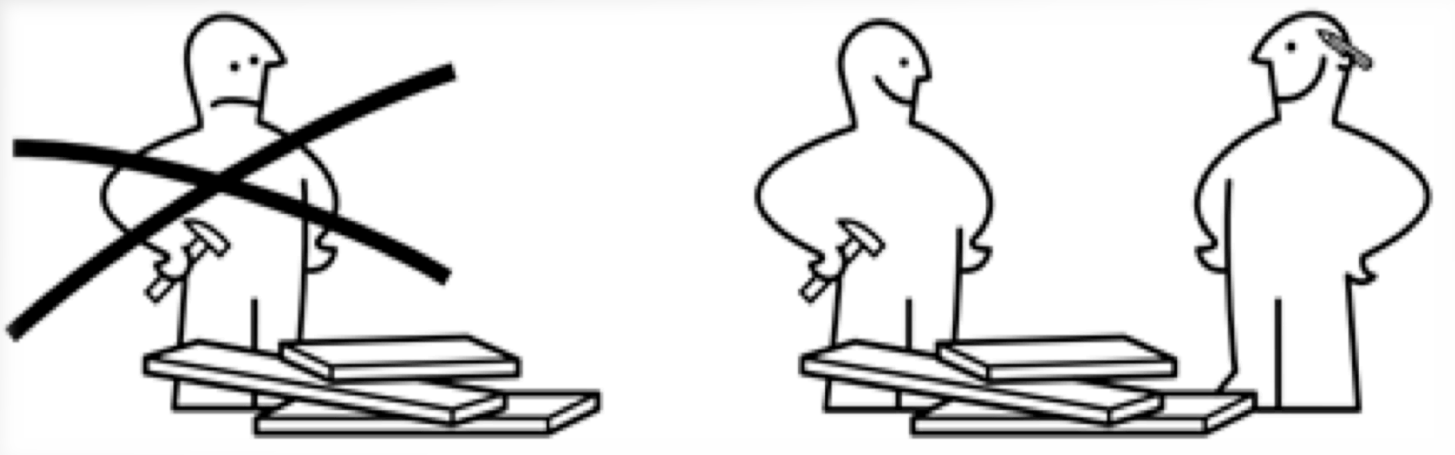
Hands-on session

Pair Programming



- Reduces risk, bug fixing and overall working time
- Shared knowledge, discussion and QA

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Change code and see what happens.

- In the interest of time the code is all there for you
  - run it
  - change it
  - break it
  - learn from it
- Notebook is standalone - go at your own pace!
- Take the notebook home and run your own data

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Using Jupyter

- Download the workshop from: https://github.com/cnjr2/eda_tech_talk
- Start the notebook:

```
Charless-MacBook-Pro:~ charles$ jupyter notebook eda_tech_talk.ipynb
```

- Double-click a cell to edit its contents (its border will become green)
- Execute the code in a cell by pressing 'ctrl+ enter' or press button.
- You can add cells with plus + button
- Put short chunks of code into each cell to go step-by-step
- Inactivate a line of code preceding it with a #; the re-run the chunk to see what changes!

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