

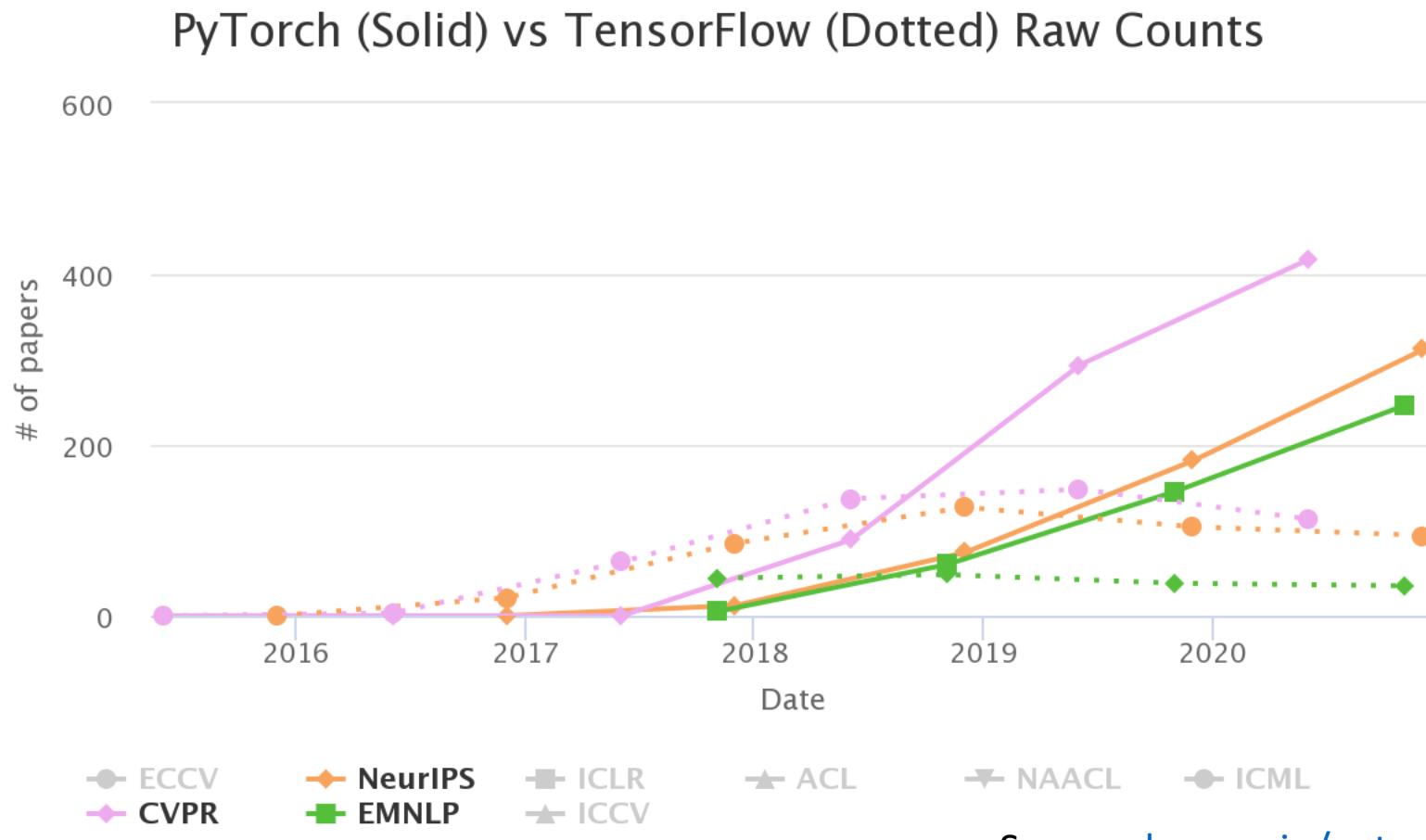
PyTorch Primer

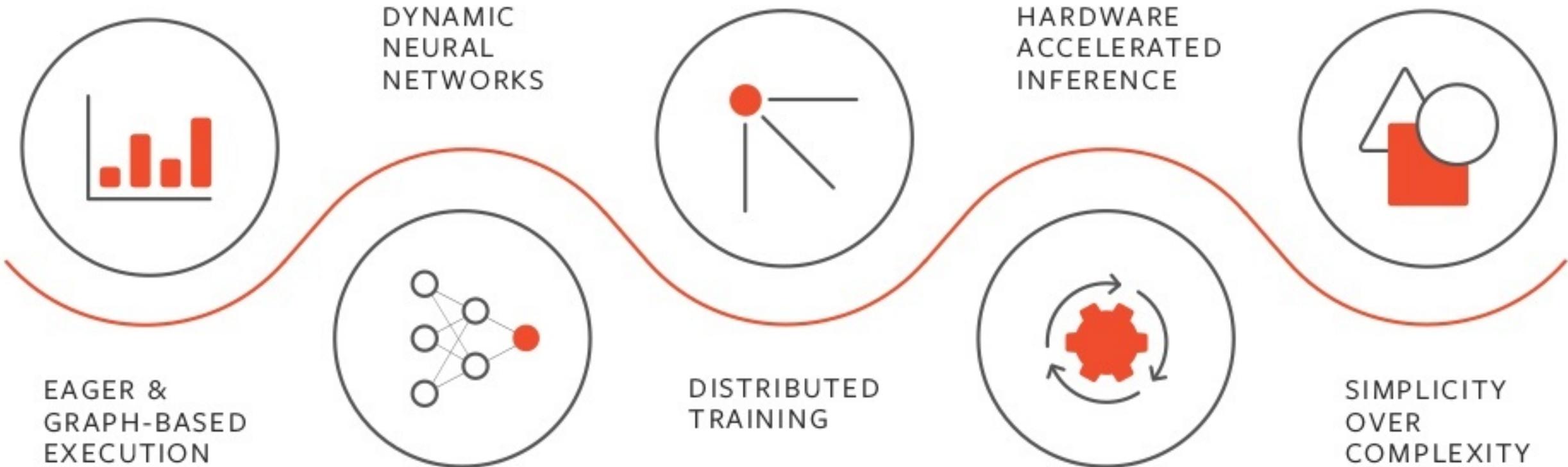
Fundamentals of GenAI

Tensors

 Data Trainers

Why PyTorch?





A tensor is an N-dimensional data structure (data container)



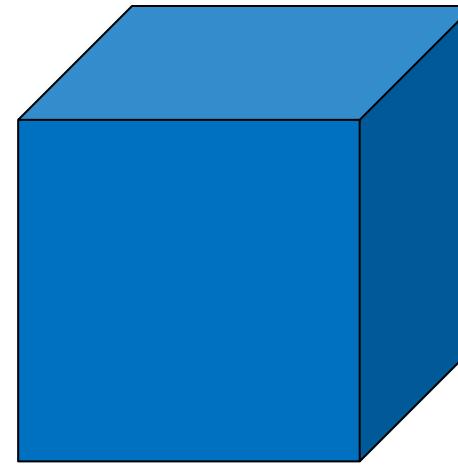
Rank 0
Tensor
scalar



Rank 1
Tensor
array, list, vector



Rank 2
Tensor
matrix



Rank 3
Tensor

Tensor dimension is not
tensor shape !

Quick start with Jupyter Notebooks



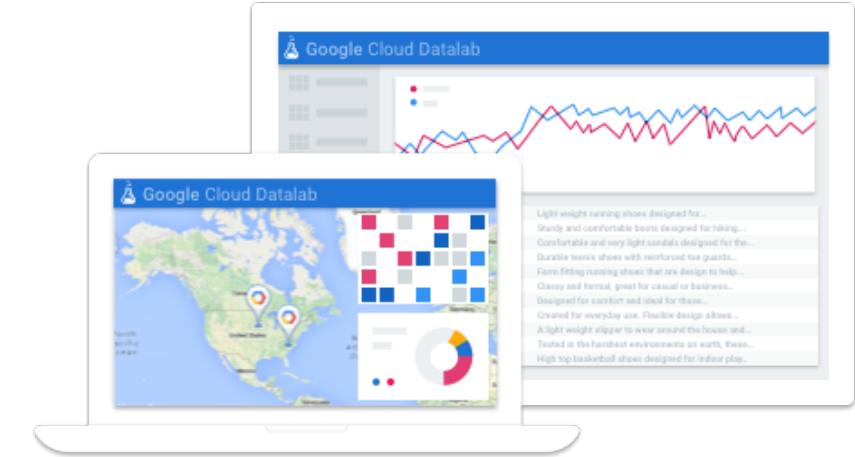
Increasingly, data analysis and machine learning are carried out in self-descriptive, shareable, executable Jupyter notebooks



Explore,
document, and
visualize your
data in one
central notebook



Access additional tools
like visualization
libraries, machine
learning APIs, and more



Present and collaborate
with your peers through
version controlled
notebooks

Notebook cells are the building blocks of a notebook

Executable
Code (e.g.
Python)
or Text

```
%%sql
SELECT if (path = '/', 'home', 'product') AS start,
       if (tx <> 0, 'completed', 'abandoned') AS outcome,
       count(*) AS count FROM (
       SELECT visitId, hits.page.pagePath as path, hits.hitNumber as hitNumber,
              sum(if(hits.page.pagePath == '/confirm.html', 1, 0)) within record as tx
       FROM [google.com:analytics-bigquery:LondonCycleHelmet.ga_sessions_20130910]
       ORDER BY visitStartTime, hitNumber)
WHERE hitNumber = 1
GROUP BY start, outcome;
```

start	outcome	count
home	abandoned	18
product	abandoned	29
product	completed	11
home	completed	5

(rows: 4, time: 0.6s, 8KB processed, job: job_wkFl2UCf8j4SdGMfE0YL9zYi0IA)

Results

Visualizations

Visualize paths taken

Sankey diagram makes it easier to see tabular data

```
%chart sankey --data conversions
```



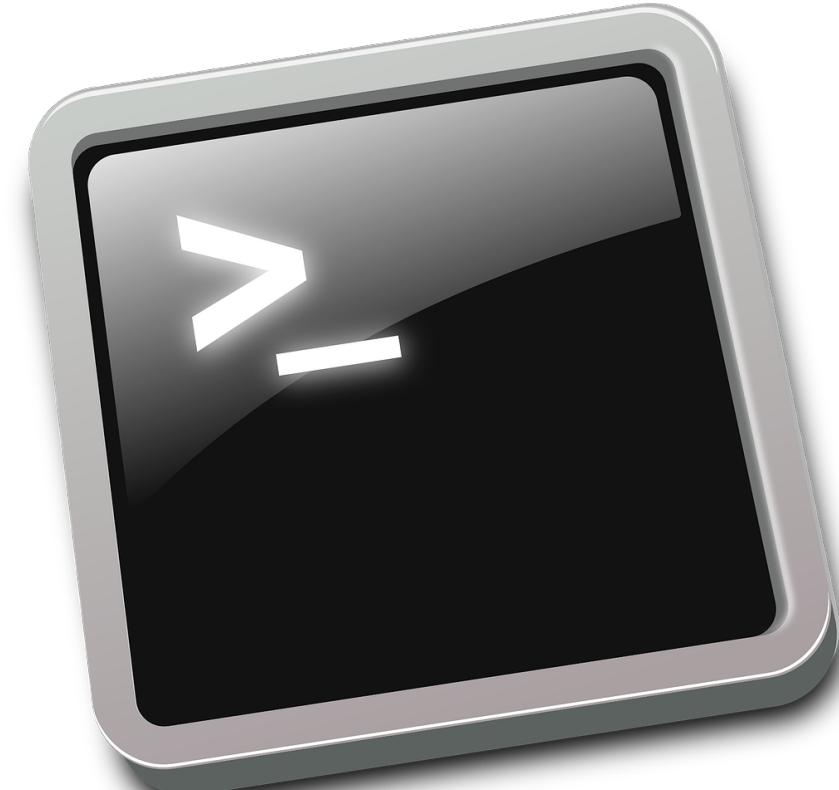
Command line **shell magics** in Jupyter notebooks

%%bash magic

- Multiple shell commands in a single code cell
- All shell command run in a single subprocess with a shared state

! (exclamation mark) magic

- Shortcut for **%%bash** for a single shell command



Pitfalls of using Jupyter notebooks

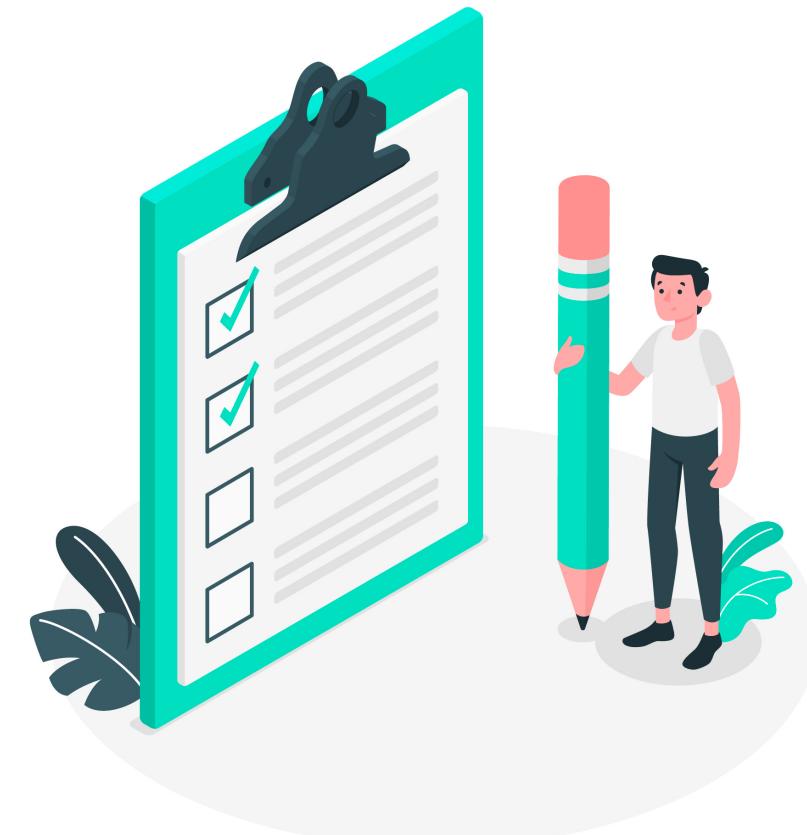
- Lack of continuous and active engagement
 - Read the notebook
 - Understand the notes and code
 - Experiment by modifying the code
- Single-node architecture
 - Limited amount of memory
 - Kernel for the language runtime
- Out-of-order evaluation
 - Code cells assume a state of the runtime



Demo

PyTorch Tensors

- ▶ Remember about PyTorch tensors



PyTorch Tensors

- ▶ Remember about PyTorch tensors

