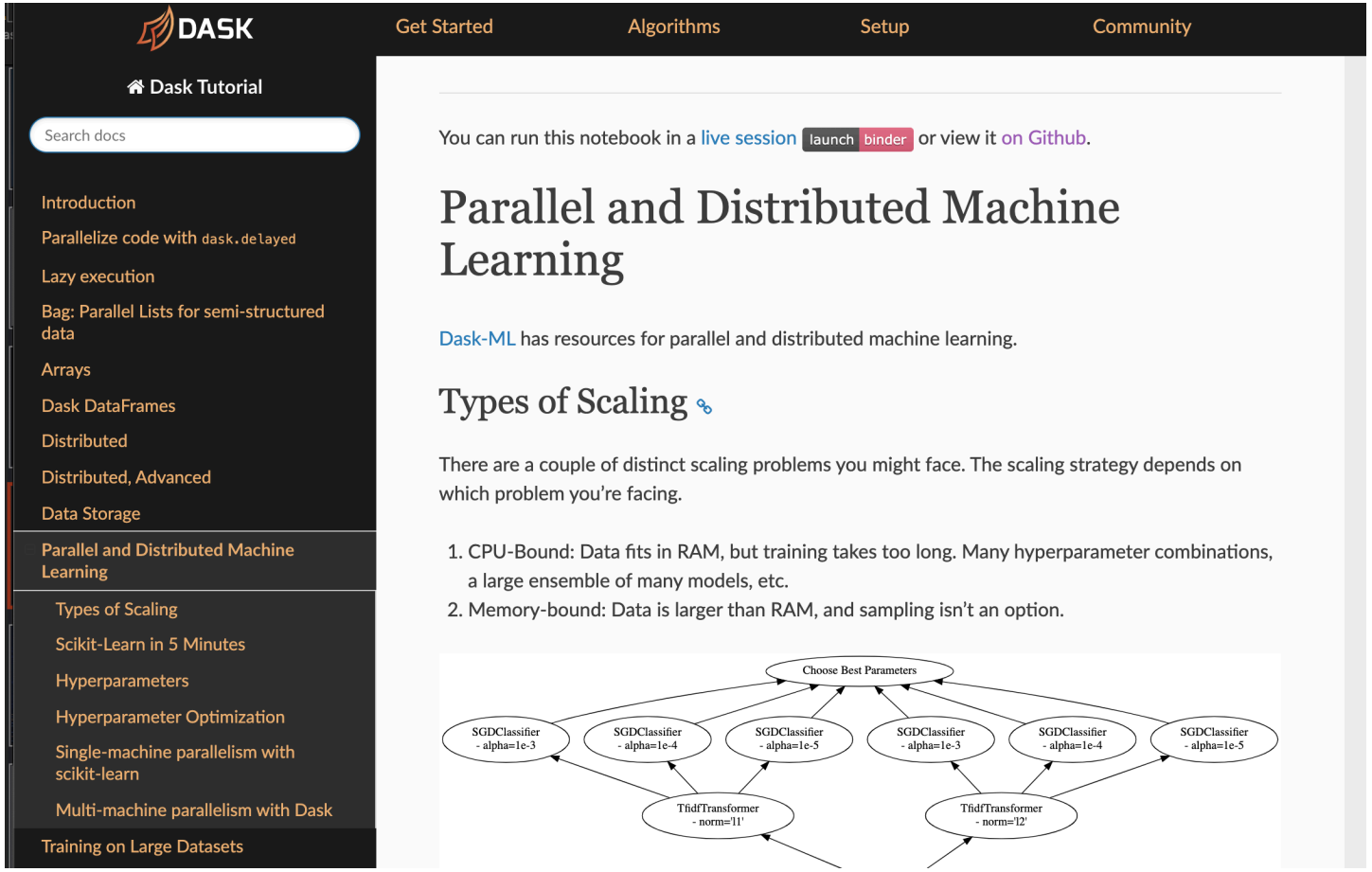

Dasking in the Sun
Applying Parallel Operations to your Pandas Transformations

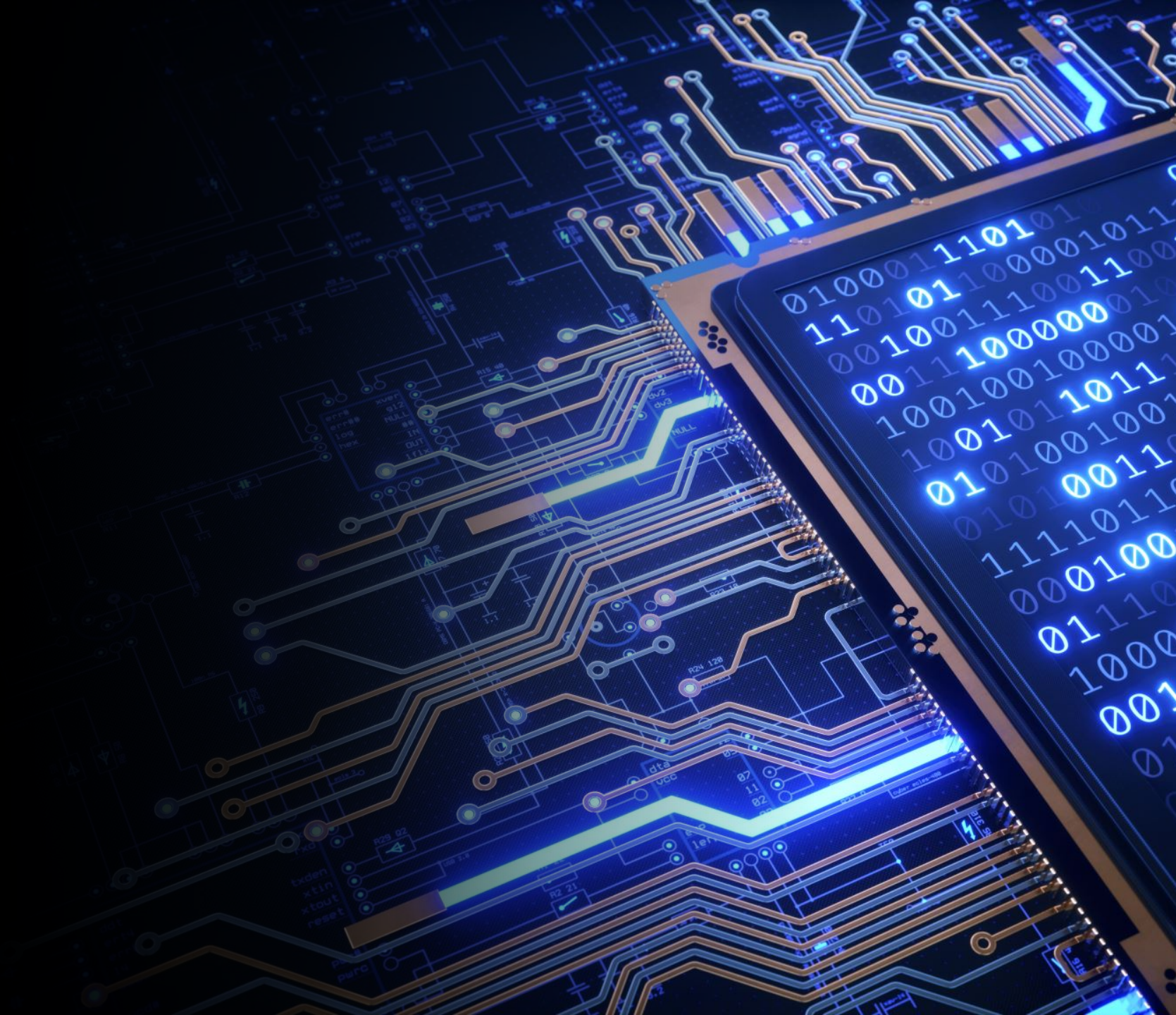
What do you do when your data become too large? Is it CPU-bound? Or memory-bound?

Dask docs provide guidance



- ***RAM:*** Your computer's short-term data storage. Can be accessed quickly.
- ***Cores:*** Modern CPUs offer cores and hyper-threading. A dual-core has 2 CPUs, quad-core has 4 CPUs, octo-core has 8, and so on.

- Processes tend to be memory-bound or CPU-bound, meaning that either the data are very large and you might run out of memory, or the number of computations is so great that you might run out of CPU.

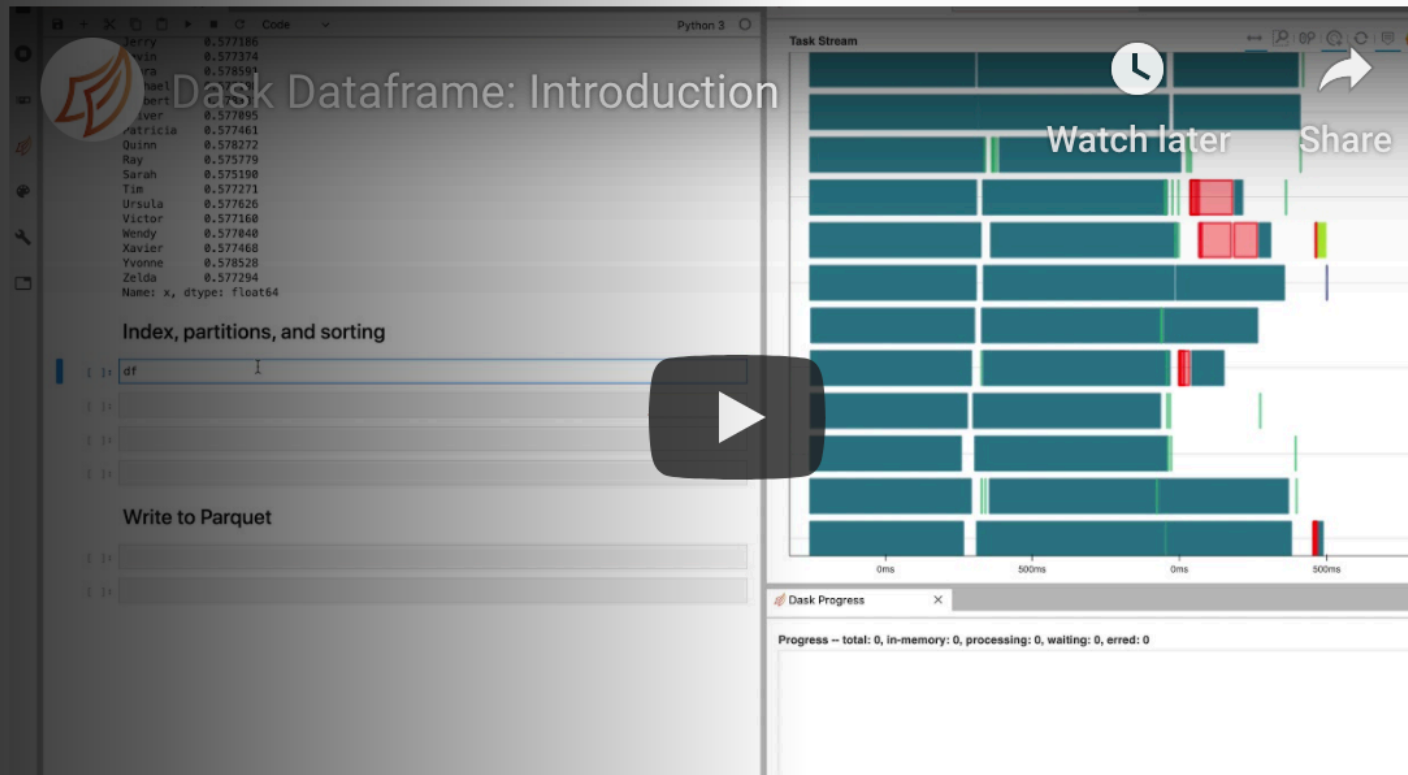


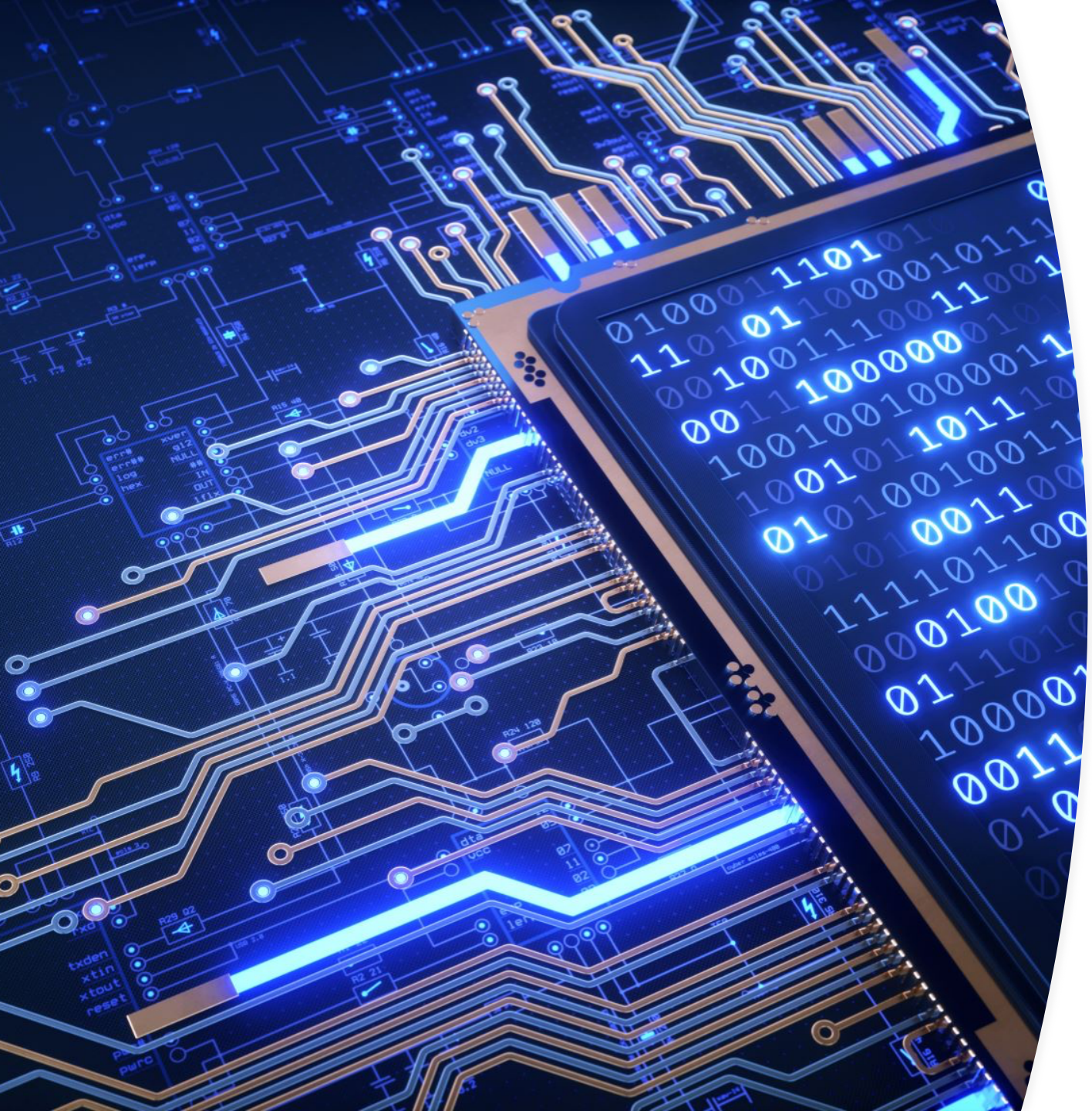
- Today's code was run on:
  - Python virtualenv created with venv
  - Requirements are in requirements.txt
  - Python 3.7.6
  - MacOS

DASK

DataFrame

A Dask DataFrame is a large parallel DataFrame composed of many smaller Pandas Dat
split along the index. These Pandas DataFrames may live on disk for larger-than-memor
on a single machine, or on many different machines in a cluster. One Dask DataFrame c
triggers many operations on the constituent Pandas DataFrames.





- The basic concept of Dask is to split data/computation up across a computer's CPU.

- Dask is installable:

```
$conda install dask
```

```
$pip install dask
```

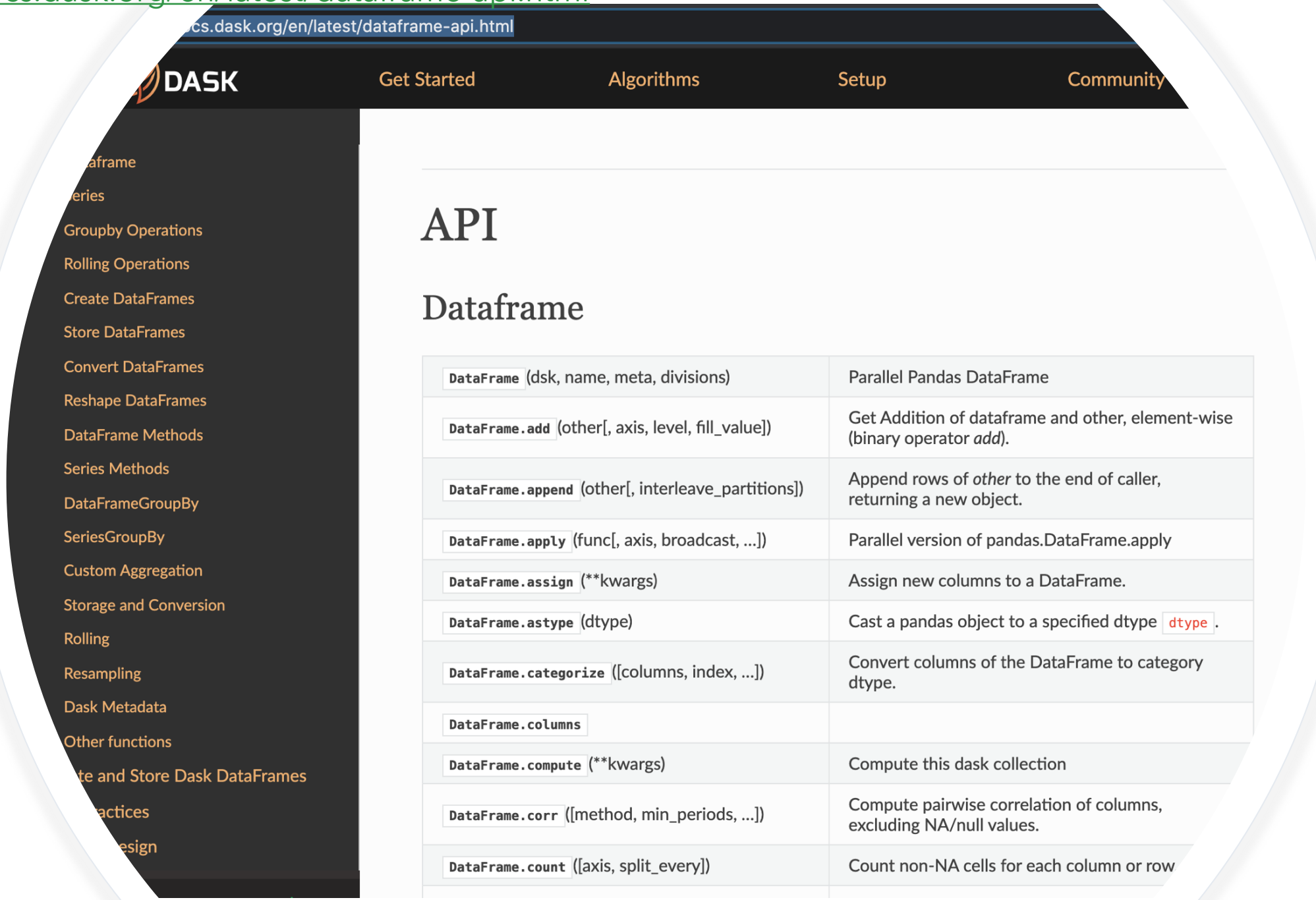
- Or from source:

```
$git clone https://github.com/dask/dask.git
$cd dask
$python setup.py install
```

Dask

- Can scale from a laptop to a cluster
- Has the concept of arrays and dataframes
- Has several ways of distributing tasks and scheduling them, including dask.delayed
- Has dask-ml, parallelized machine learning that works alongside scikit-learn (scikit-learn already has joblib, but Dask extends this package to clusters)

https://docs.dask.org/en/latest/dataframe-api.html



- Multiprocess: https://docs.python.org/3/library/multiprocessing.html
- Modin: https://modin.readthedocs.io/en/latest/
- Swifter: https://pypi.org/project/swifter/
- Ray: https://pypi.org/project/ray/
- Pandarallel: https://pypi.org/project/pandarallel/
- Dask: https://dask.org/

- vectorization
- .iterrows()
- .apply()
- .itertuples()
- https://medium.com/swlh/why-pandas-itertuples-is-faster-than-iterrows-and-how-to-make-it-even-faster-bc50c0edd30d