Vaex: a faster pandas alternative

Hao Cheng, Jerry Lin, Justin Mason, Caitlyn Yen, Elsa Yen


vaex
A faster pandas alternative

Typical data analysis workflow involves pandas

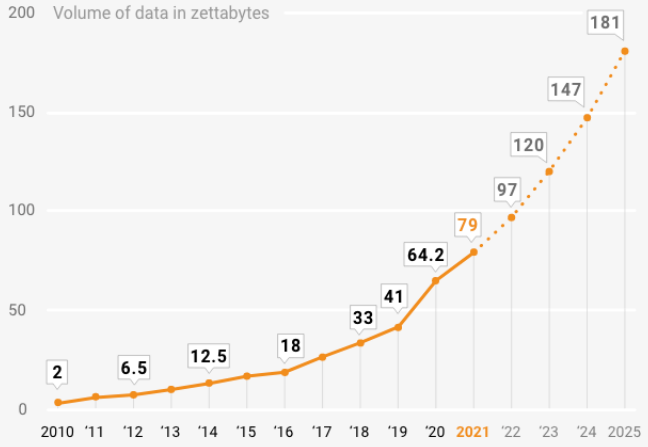
Can pandas keep up with this growing trend?

Faster alternatives?

vaex

Volume of data created, captured, copied, and consumed worldwide

The volume of data generated, consumed, copied, and stored is projected to exceed 180 zettabytes by 2025

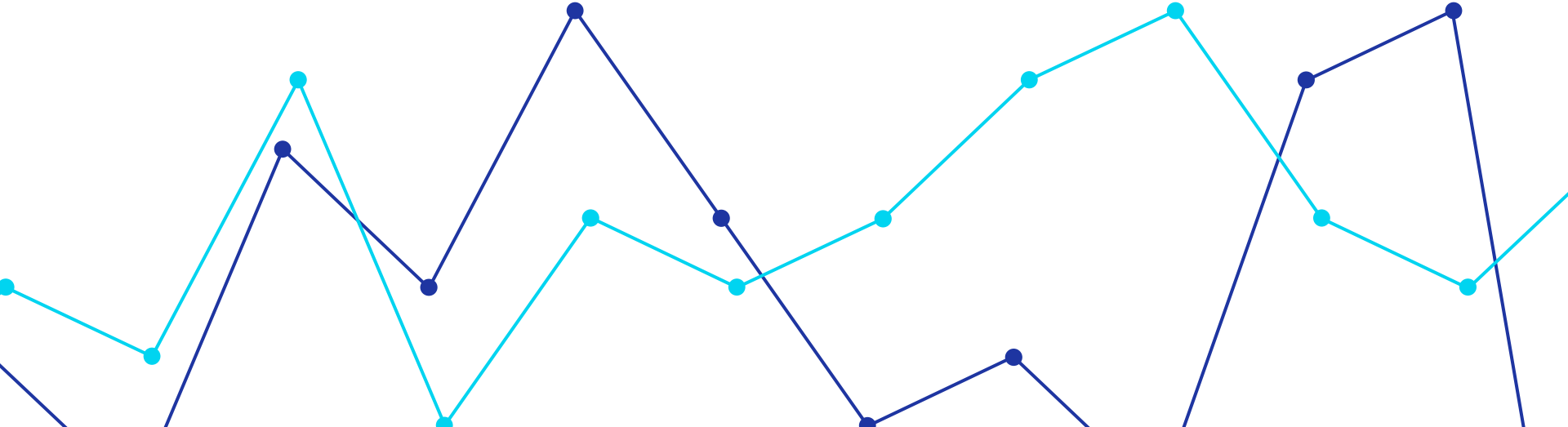


Source: statista.com

firstsiteguide.com

- Lazy
  - Perform operations only when called
- Out-of-core
  - Process data too large to fit in computer's main memory
- Scale
  - Datasets as big as your hard drive
- Performance
  - 10 billion rows/second
- Plot
  - Native support, one-line implementation
- Virtual columns
  - Does not take up any memory, computed when needed

Can vaex outperform pandas? SQL?



Strategy

Tools

Pandas

Vaex

SQL

File Sizes

1 GB

5 GB

10 GB

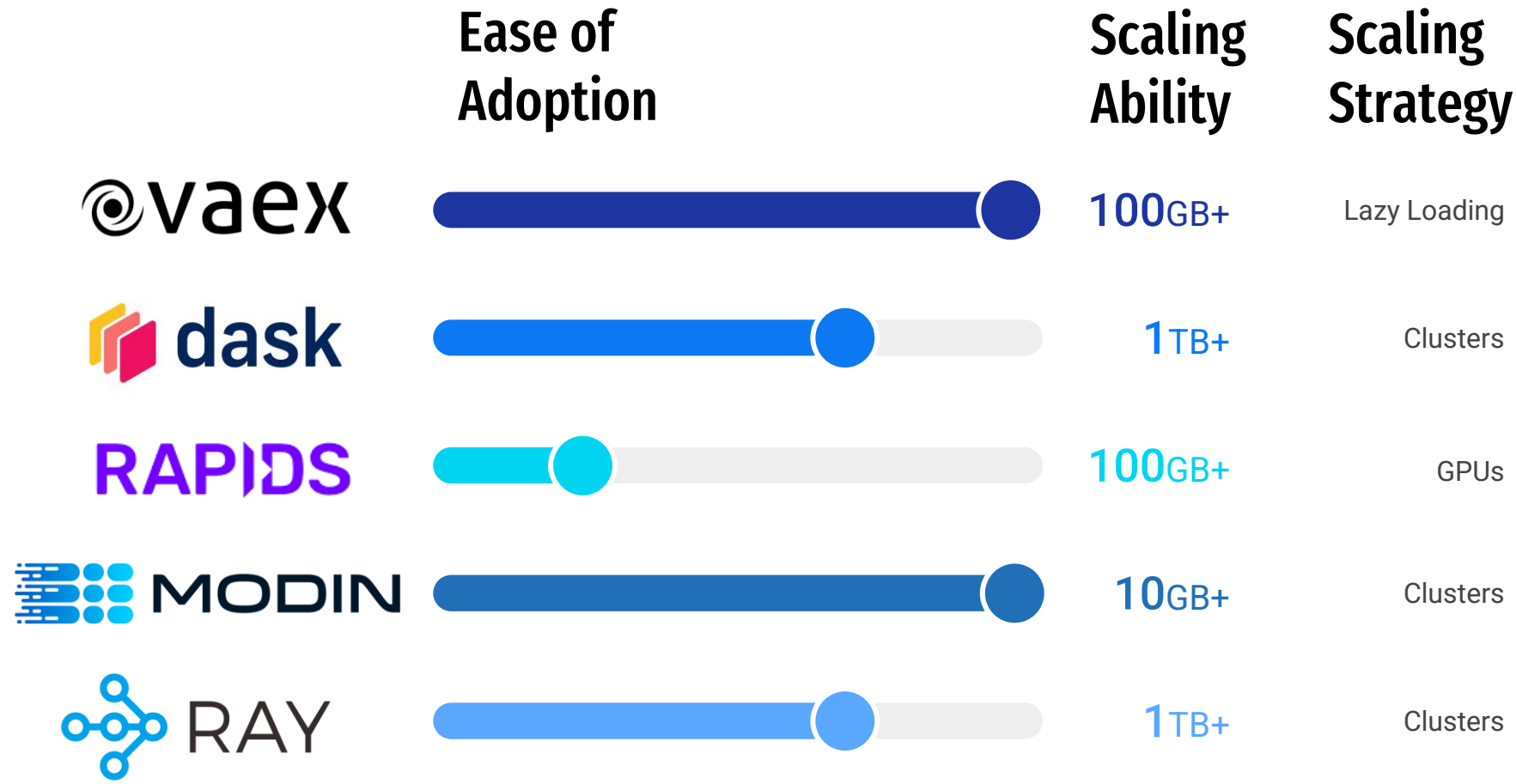
Performance

Data loading

Data cleaning

Plotting

Results


Ease of Adoption
Scaling Ability
Scaling Strategy
vaex
100GB+
Lazy Loading
dask
1TB+
Clusters
RAPIDS
100GB+
GPUs
MODIN
10GB+
Clusters
RAY
1TB+
Clusters

Is vaex a pandas killer?

- Size range: 5-100+ GB
- Routine Tasks: data cleaning, plotting, basic analysis
- Pandas to vaex: easy learning curve
- Advance tasks: look elsewhere

- Size range: < 1 GB
- Still the go-to option for most tasks

Questions?

Vaex plot of taxi pickup locations in New York City

107 GB file
1,173,057,927 rows
0.0233 seconds