Python for Data processing

Lecture 5:
Pandas - Part II

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What we already know

- NumPy
- PyTorch
- basics of Pandas: series and dataframes, reading files

This lecture

- SQL-like operations on dataframes

  (including grouping and joins)

- efficient Pandas

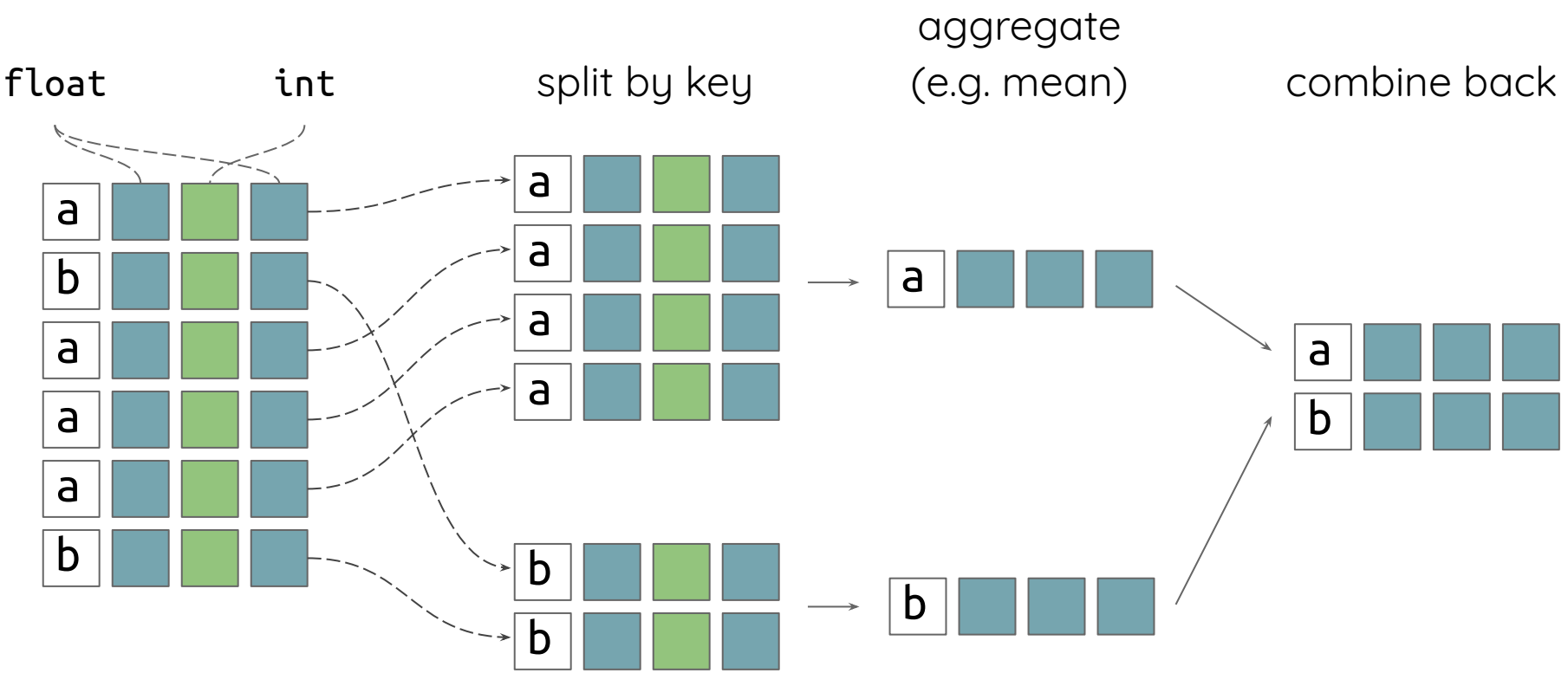
Grouping dataframes

Split-apply-combine

- group data by some key (keys)
- perform calculations for each group
- combine data

Very **common** pipeline

Split-apply-combine



Split-apply-combine

- not all operations may be applied to some columns
- columns `dtype` may change
- aggregation may not involve data values (`.size()`)

Basic grouping

Entry point to grouping operations in **pandas**:

df.groupby(...)

Nothing happens immediately

Only when you **actually** perform operations

Grouper

Fancy way of setting grouping keys

Not very useful with usual keys

Extremely useful with **DateTime** keys

Joining dataframes

Join operations

Combine two dataframes based on some keys (in both)

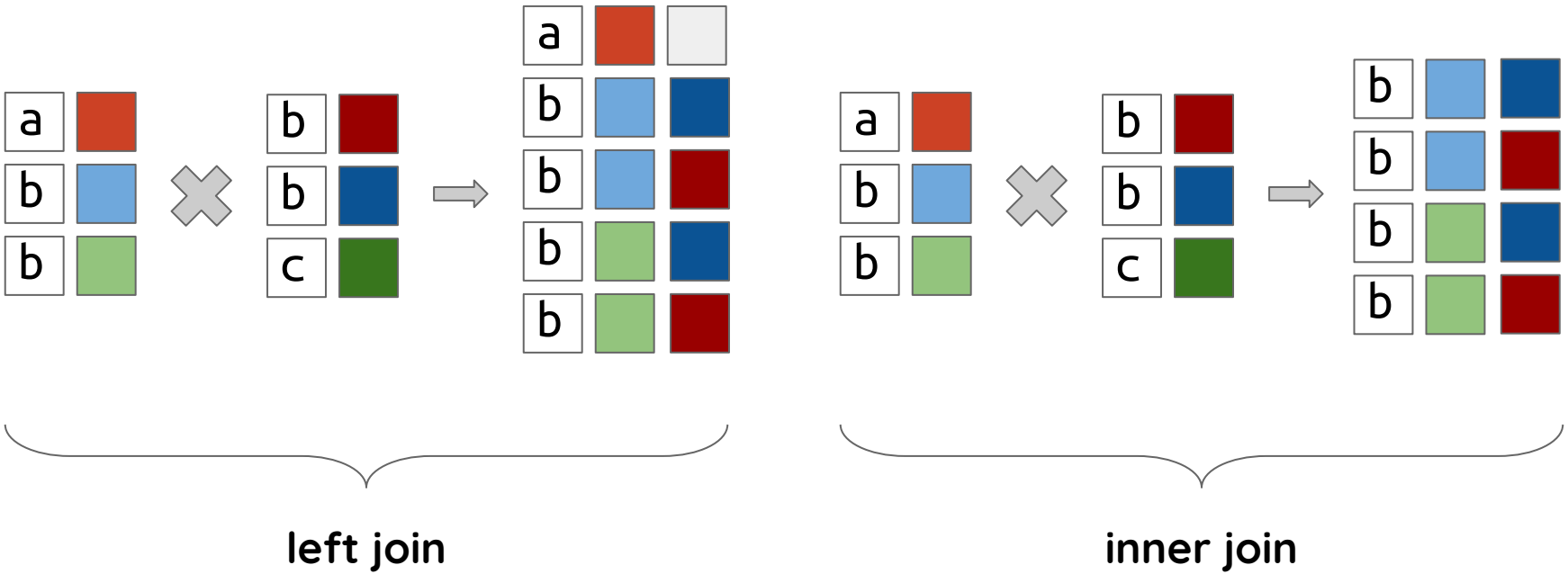
Types:

inner, outer, left, right

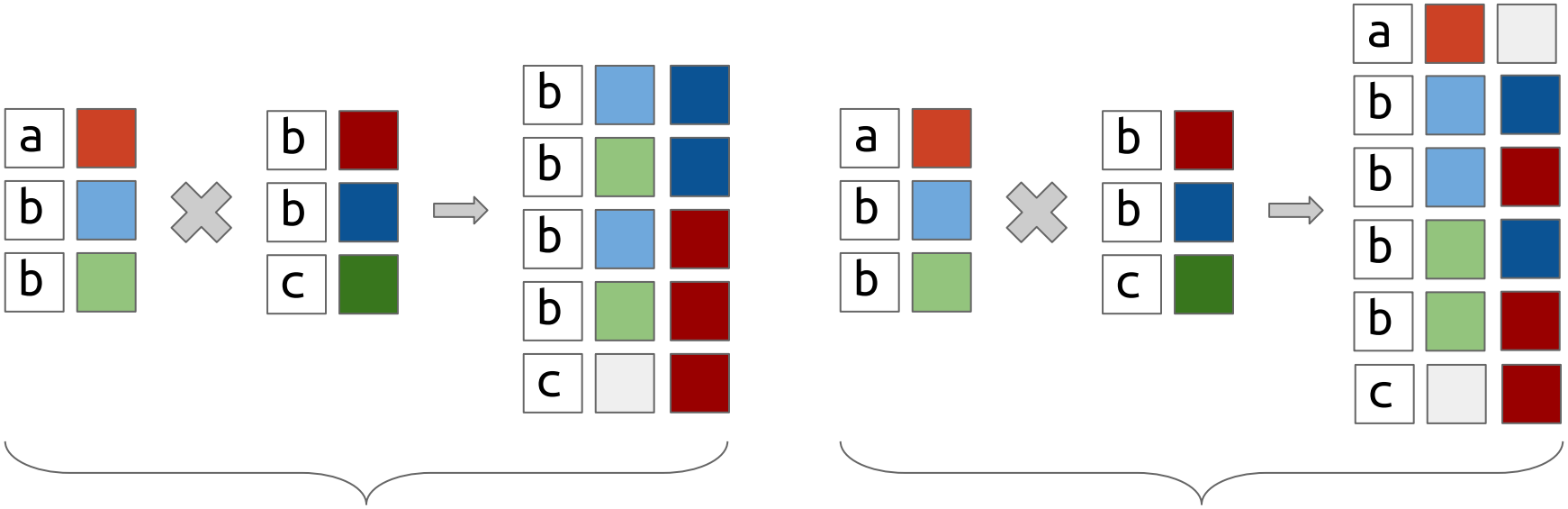
df.join(other_df, on=...)

df.merge(other_df, ...)

Left and inner joins



Right and outer joins



Efficient pandas

Efficiency & performance

Two dimensions:

- running time
- memory footprint

Running time:

efficient loops, vectorized operations(it's often **numpy** under the hood)

Memory:

reasonable dtype, no intermediate df's, **eval** and **query**

What we've learned

More advanced **pandas** stuff:

- grouping
- time series operations
- joins

What we already know

- Jupyter
- NumPy
- PyTorch
- Pandas

questions?