Distributed Text Index Construction

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Department of Computer Science
Chair 11: Algorithm Engineering
Algorithmic Foundations and Education in Computer Science

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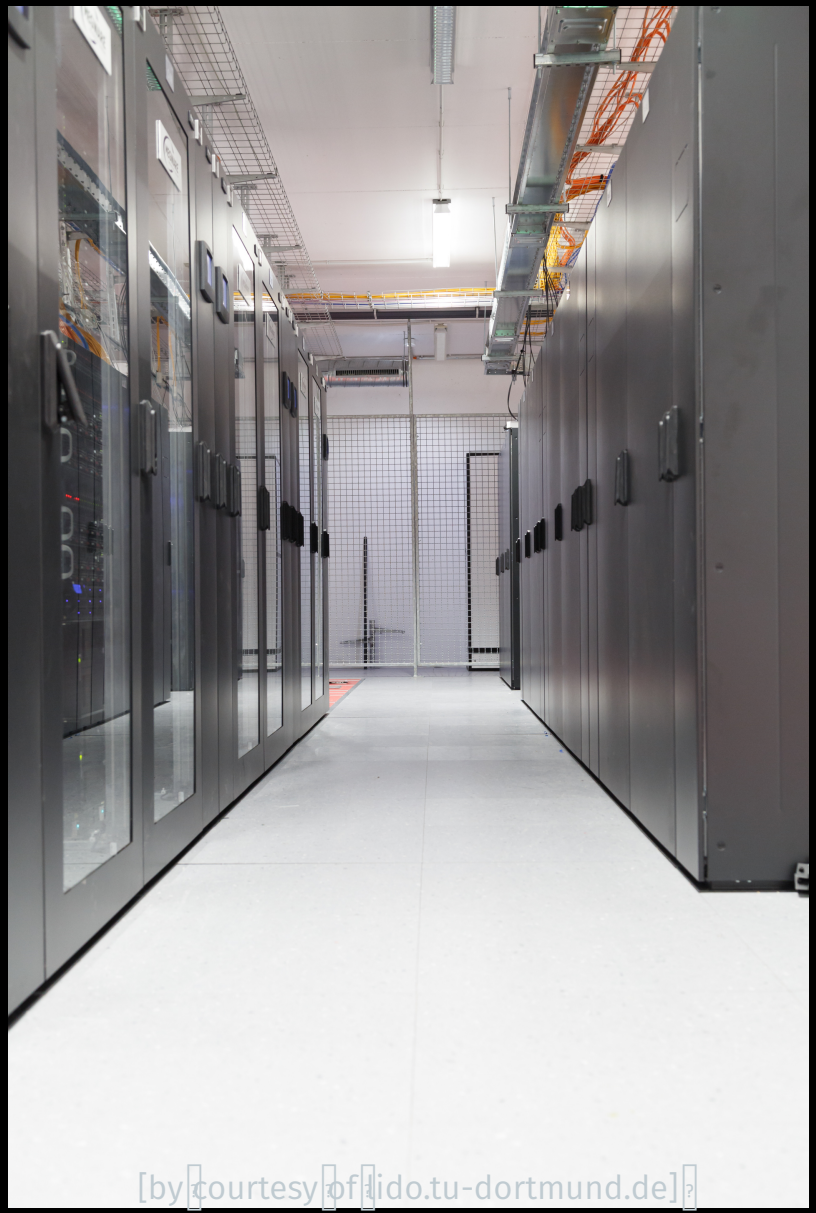
DISTRIBUTED (COMPUTING)

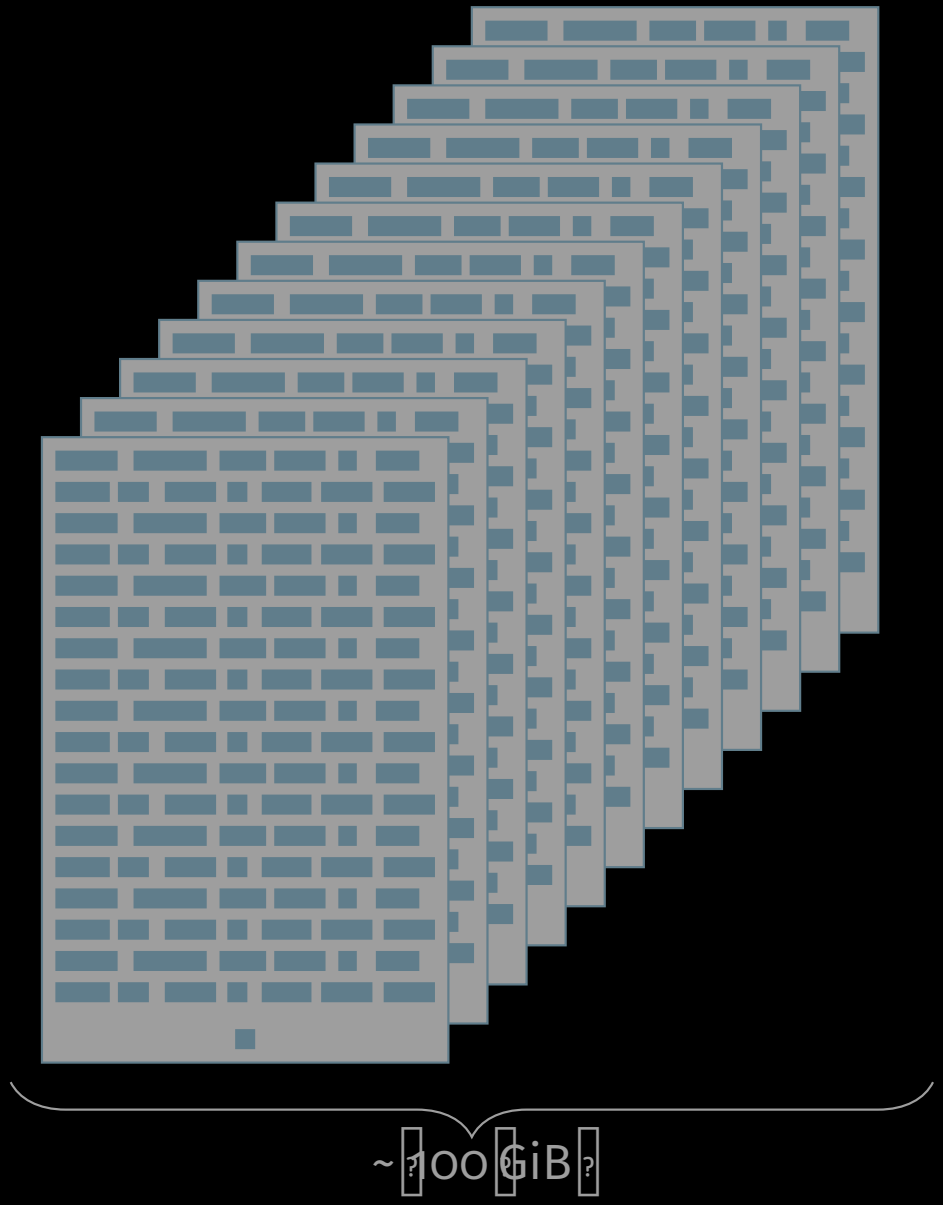


[by courtesy of ido.tu-dortmund.de]

In Practice

- Synchronization is expensive
- Load-balancing is important
- Communication & memory efficiency

TEXT INDEX



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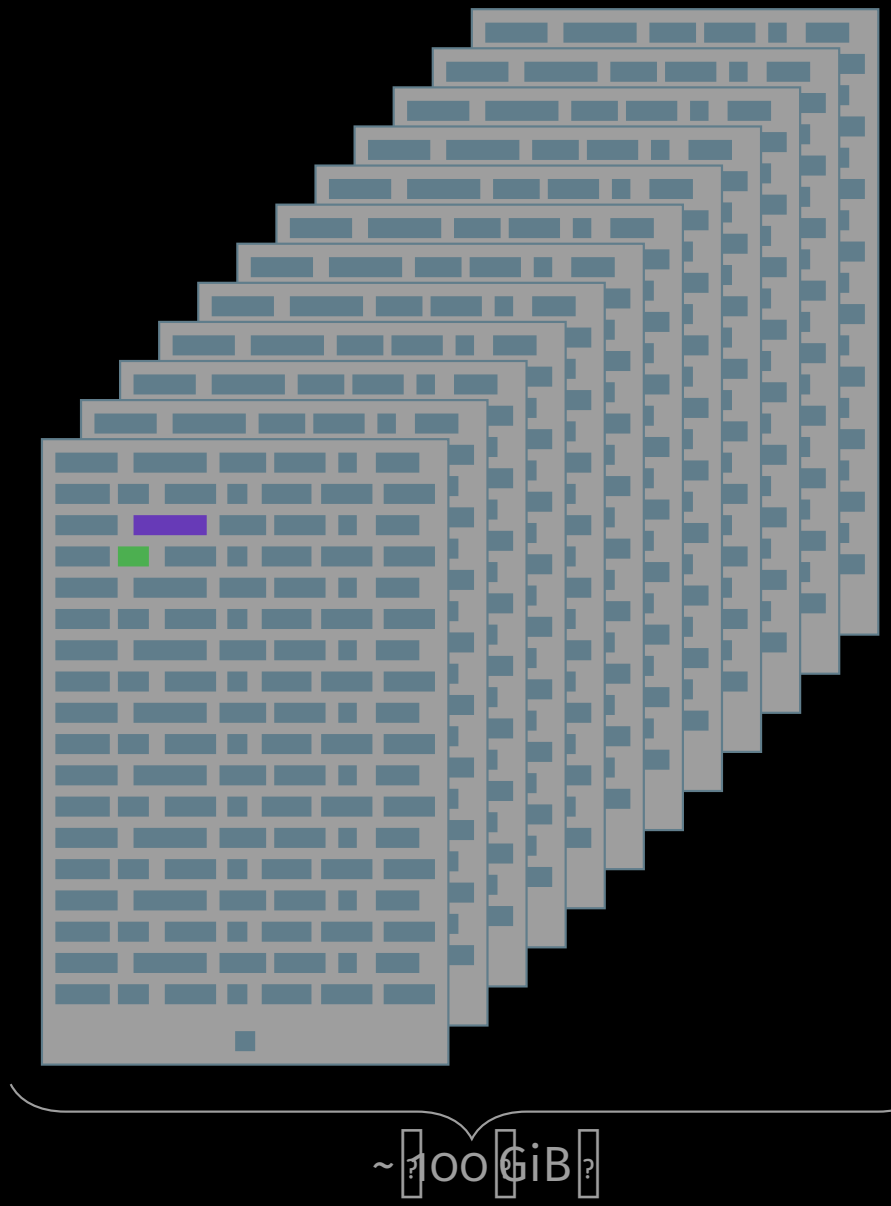

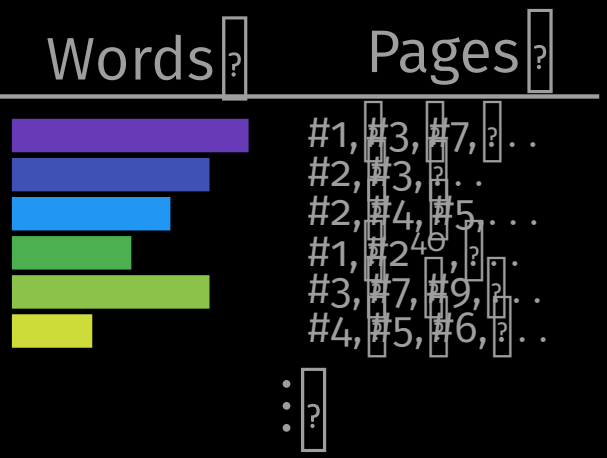

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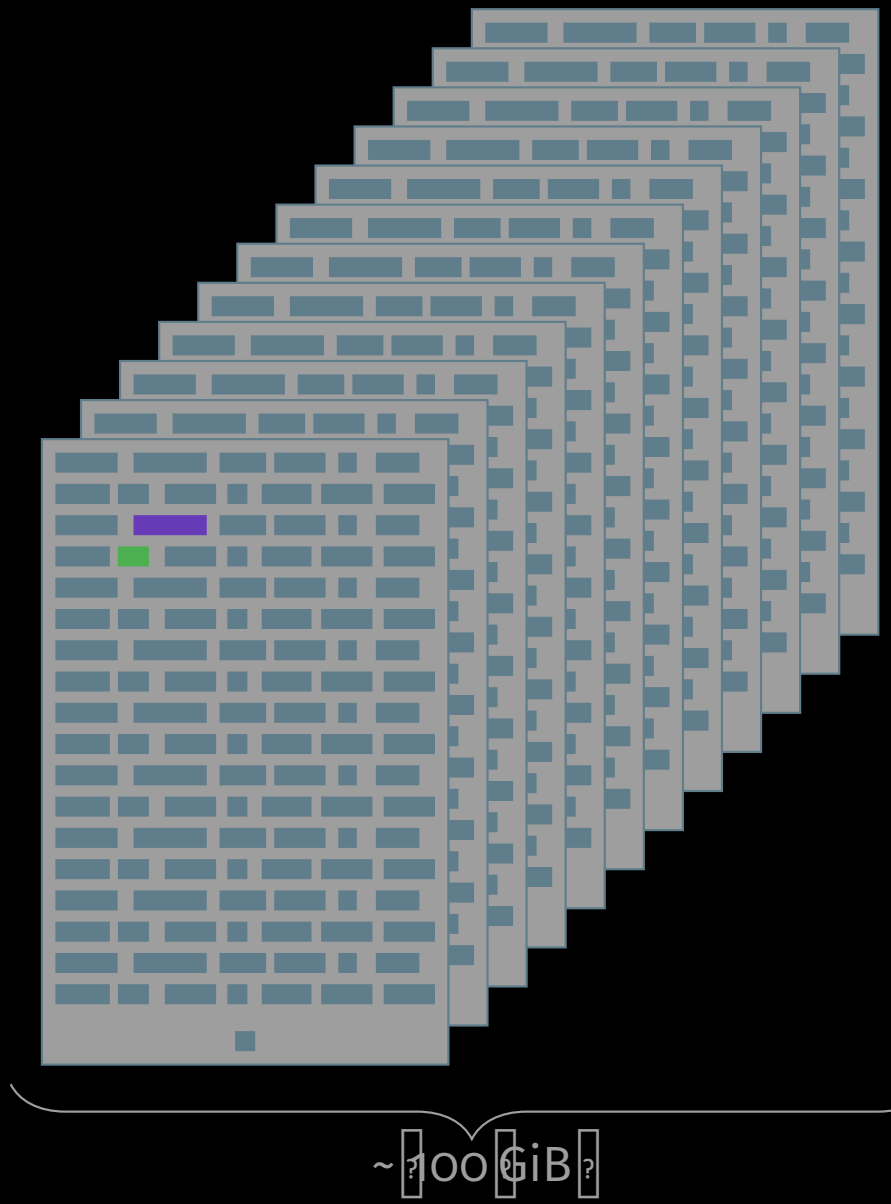

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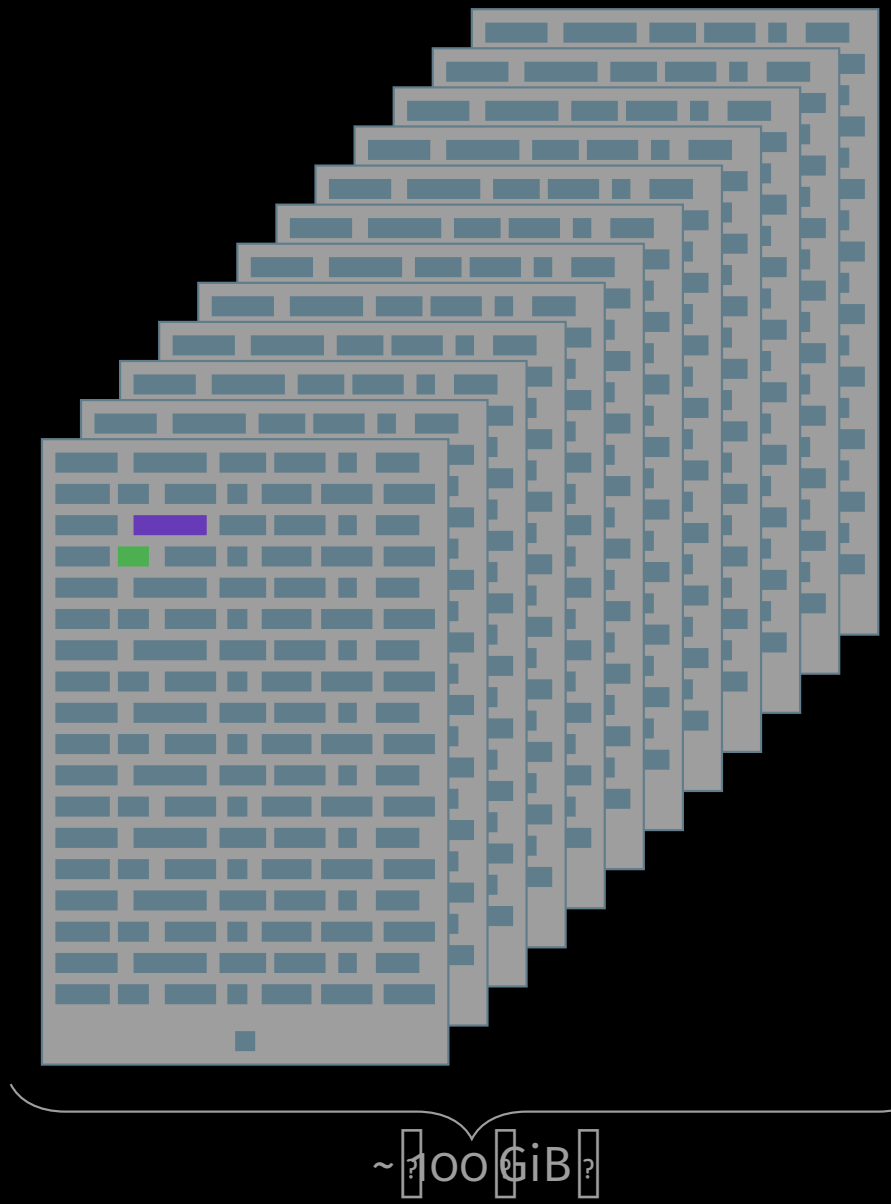

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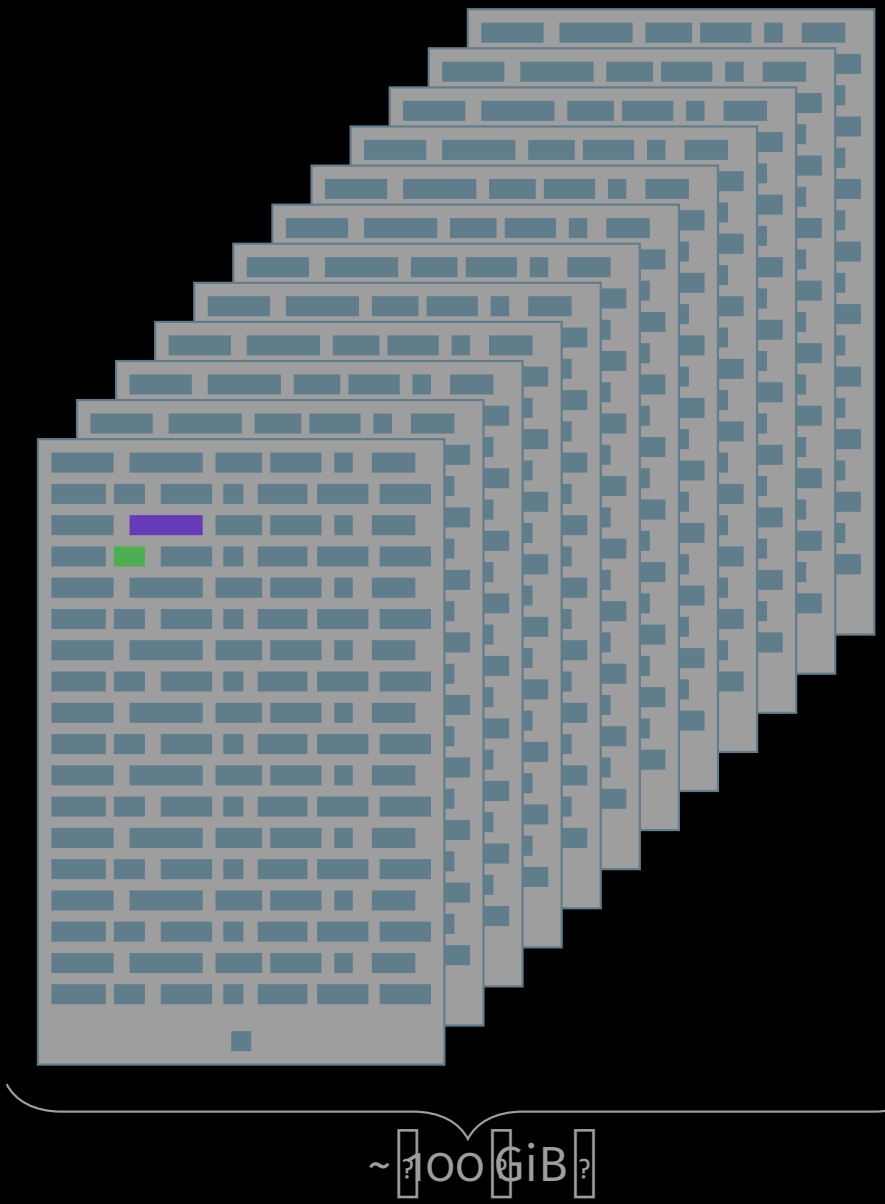
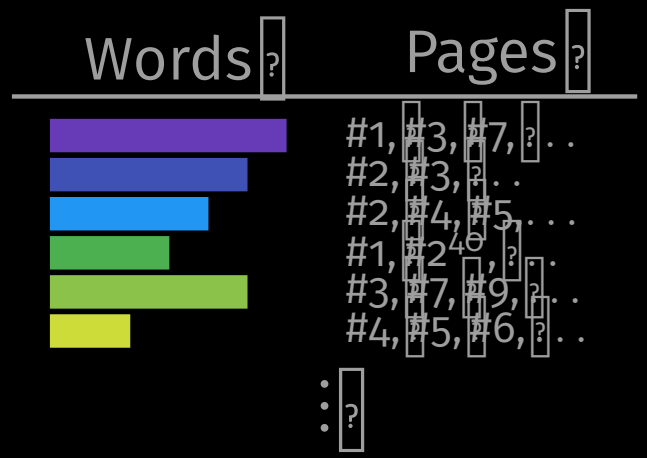
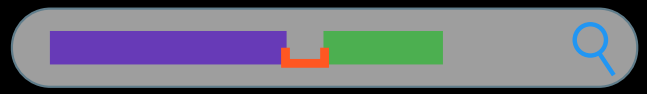


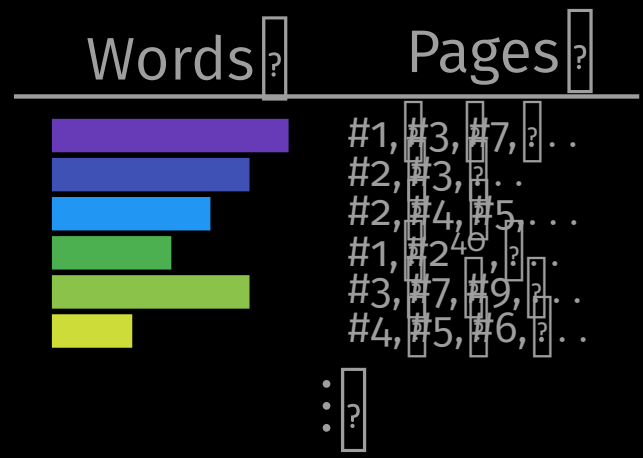


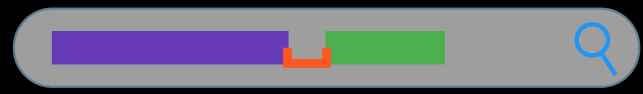


. . . but what if?

TEXT INDEX

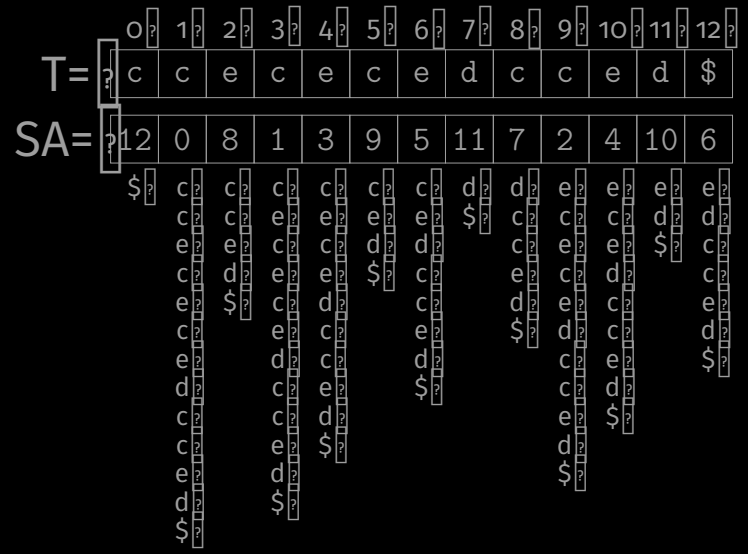
~100 GiB

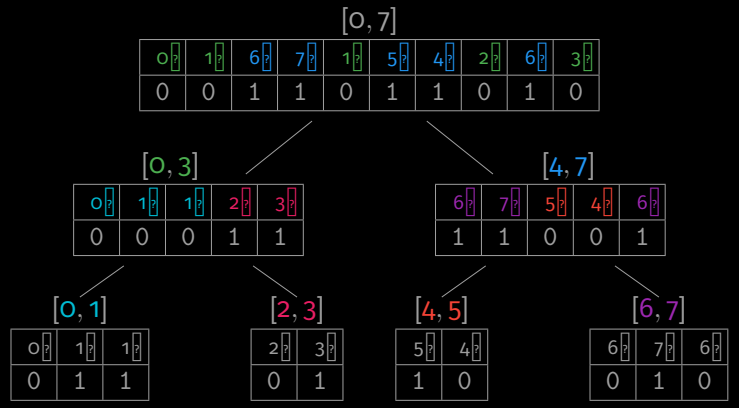




. . . but what if?

SUFFIX ARRAYS & WAVELET TREES



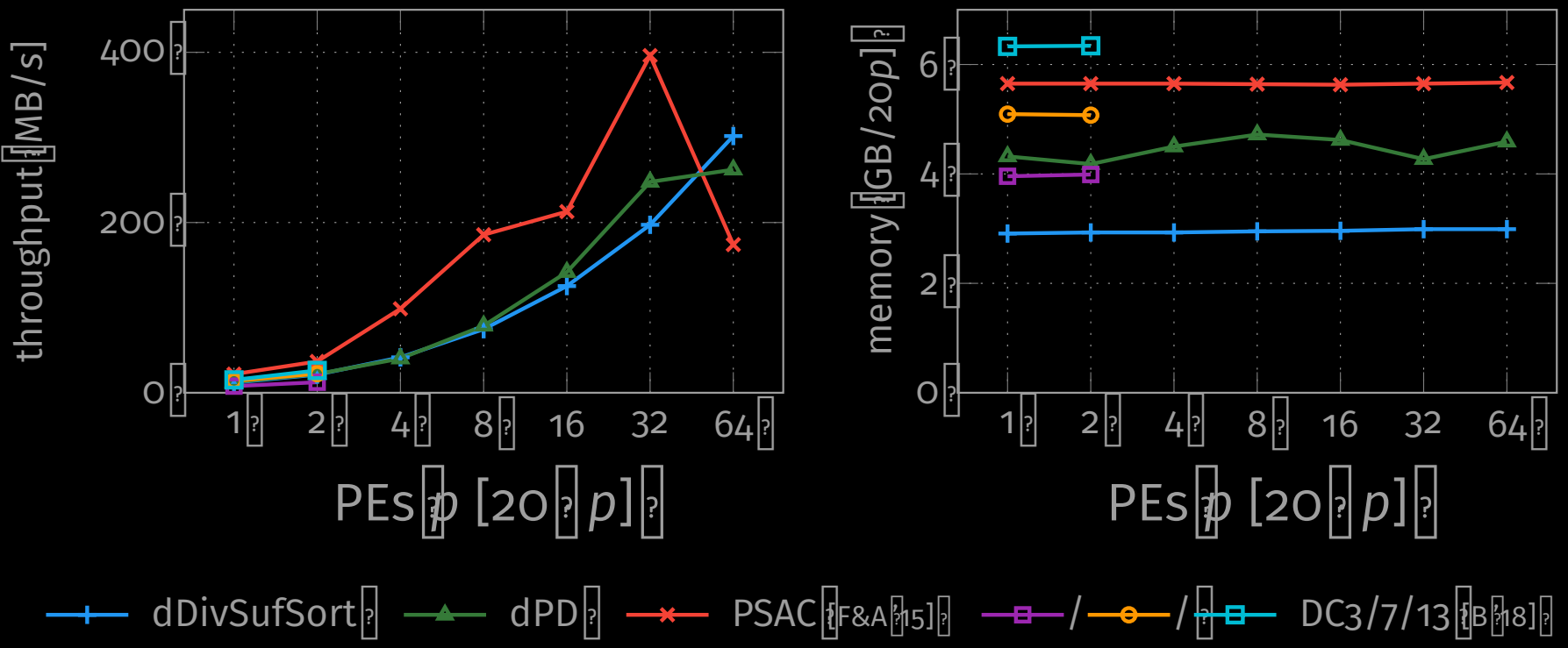


- Sorting suffixes
- Lots of data dependencies
- /kurpicz/dsss

- Working on bits
- Sorting is too much
- /pdinklag/distwt

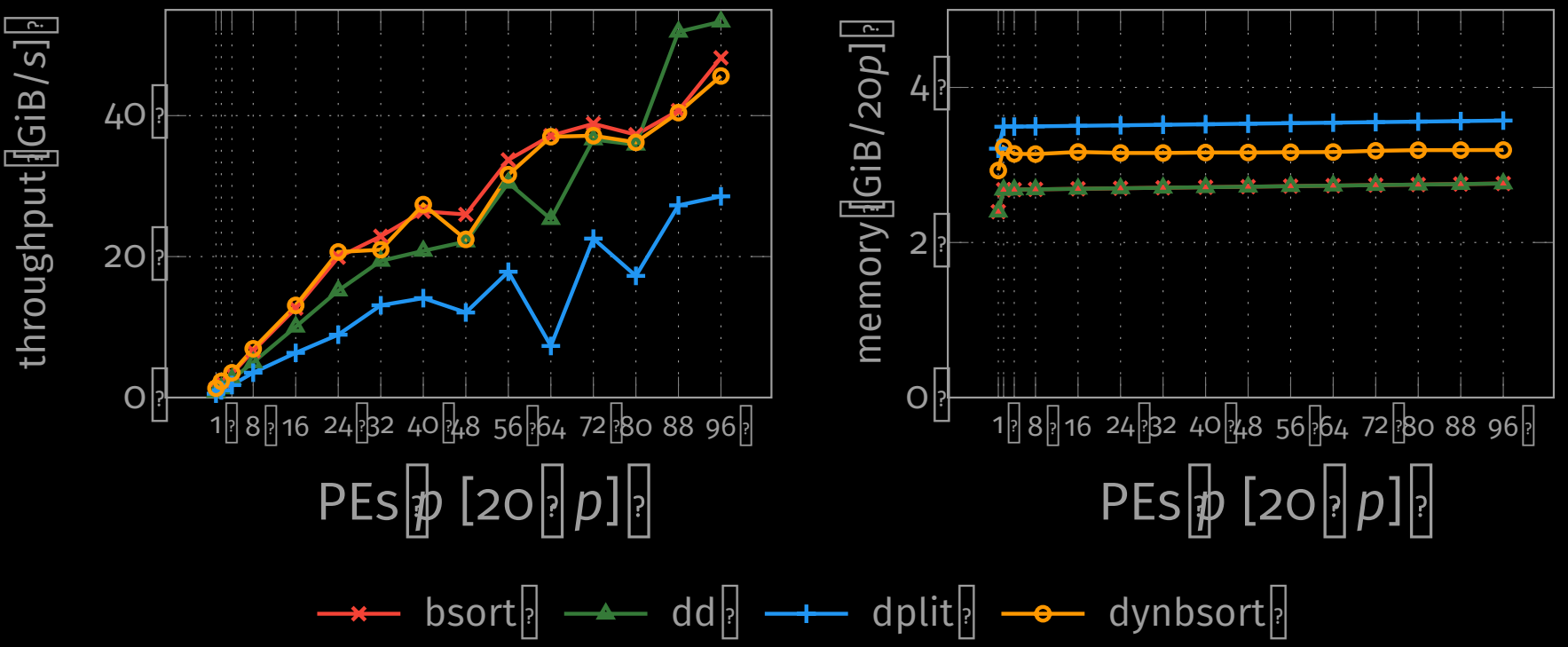
(EVALUATING THE) CONSTRUCTION

- Evaluated suffix array construction on the LiDO3 cluster
- Weak scaling experiments (only **DNA**) with 90 MB per PE



(EVALUATING THE) CONSTRUCTION

- Evaluated wavelet tree construction on the LiDO3 cluster
- Weak scaling experiments (only **DNA**) with 53 MB per PE



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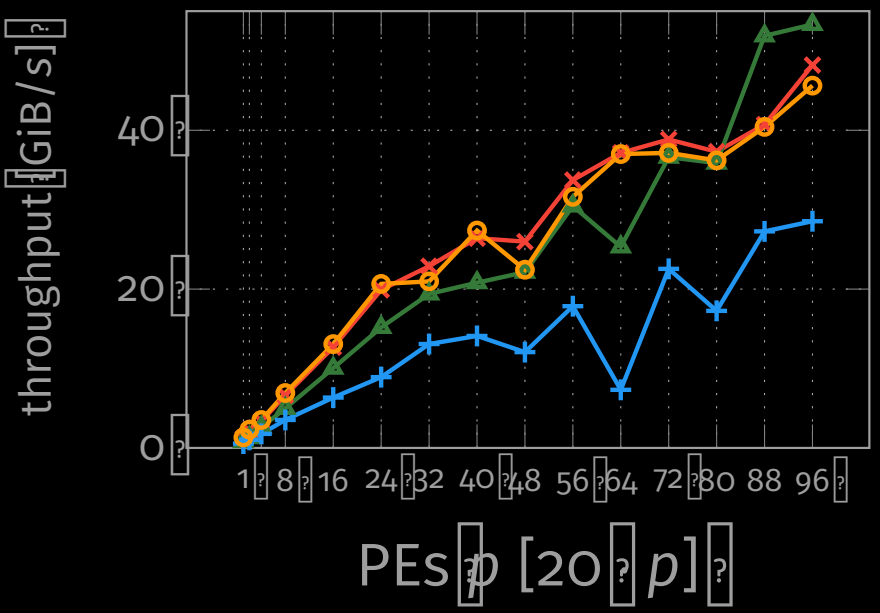

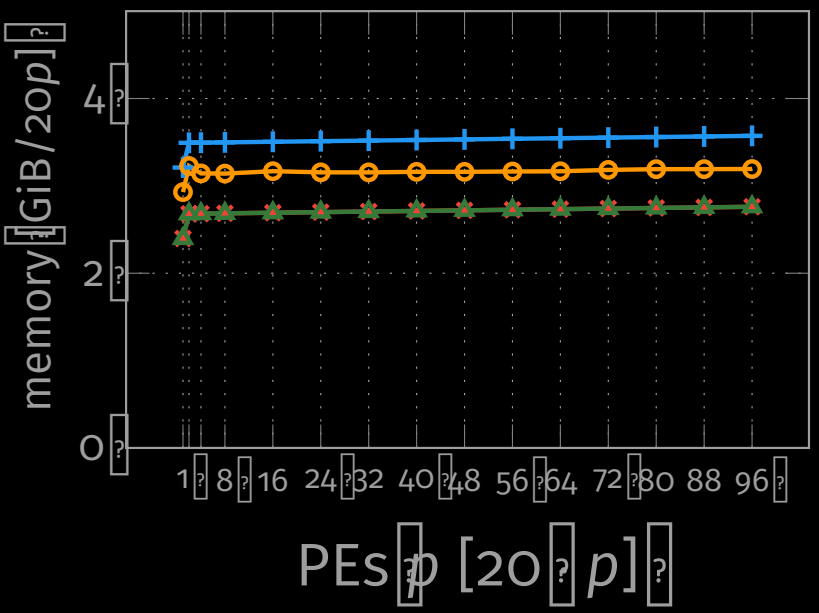

bsort dd dplit dynbsort

Thank You