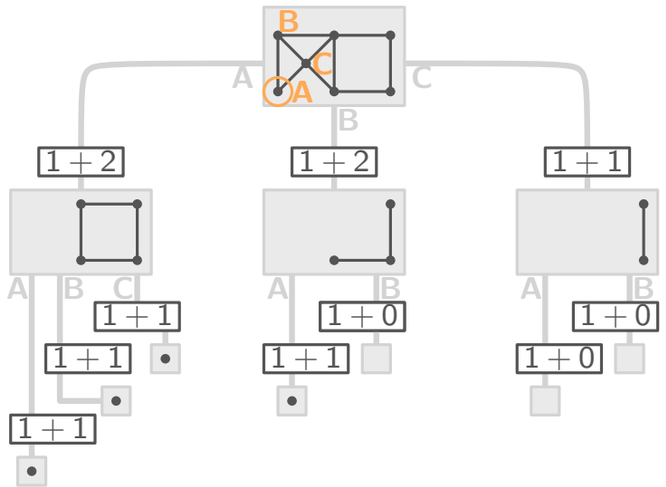
Julius-Maximilians-
UNIVERSITÄT
WÜRZBURG

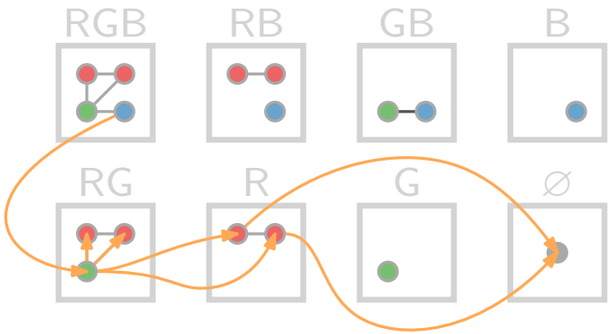
Advanced Algorithms

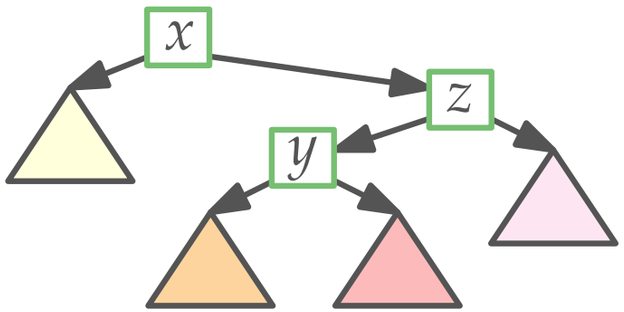
Introduction

Topics, Course Details, Organizational

Johannes Zink · WS23/24







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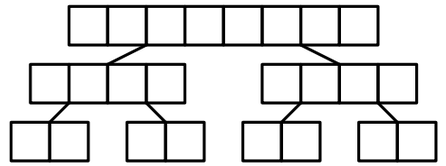

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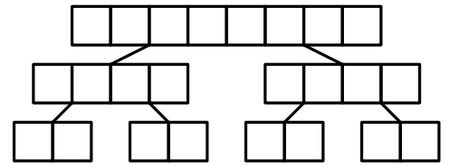

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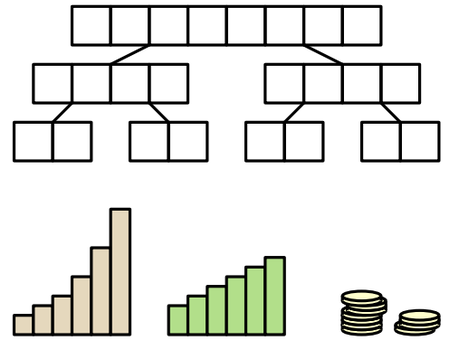

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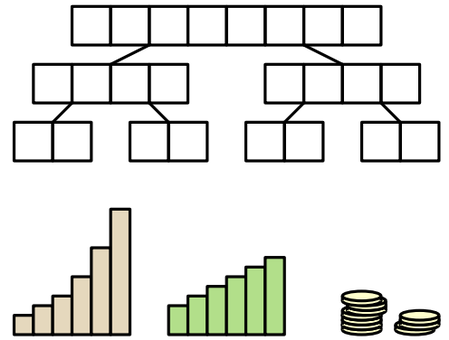

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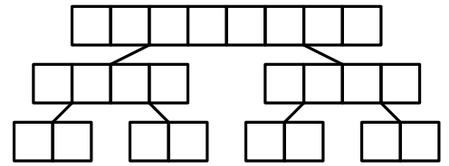

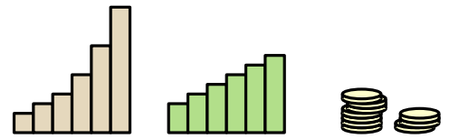

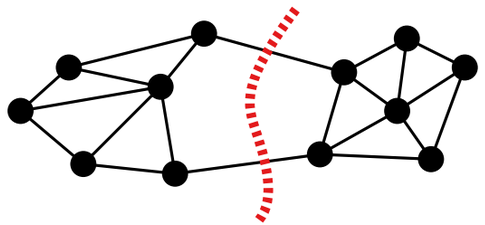

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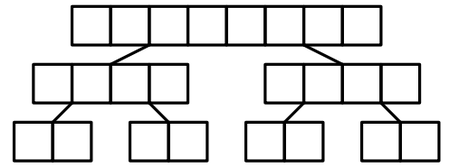

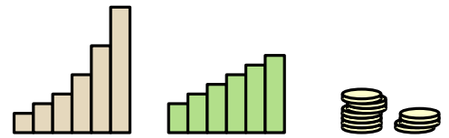

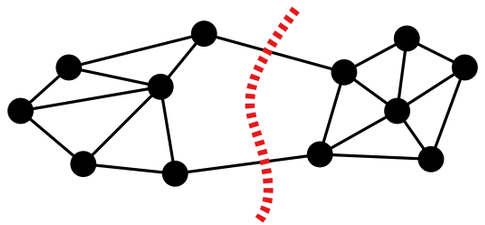

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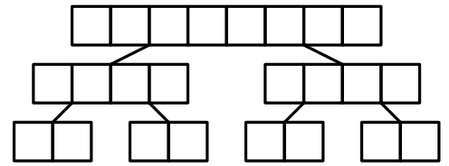

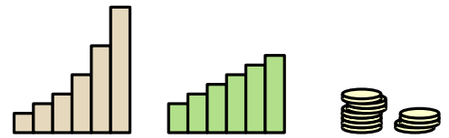

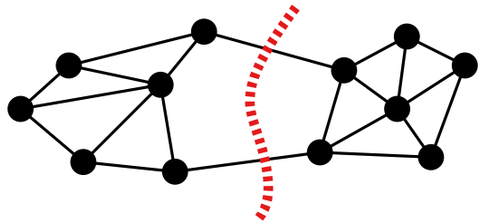

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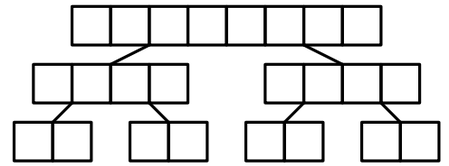
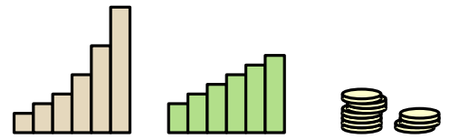
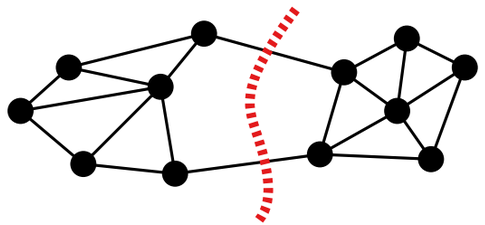
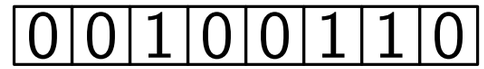
- **Data structures:** lists, binary search trees, dictionaries, succinct, randomized, probabilistic, ...









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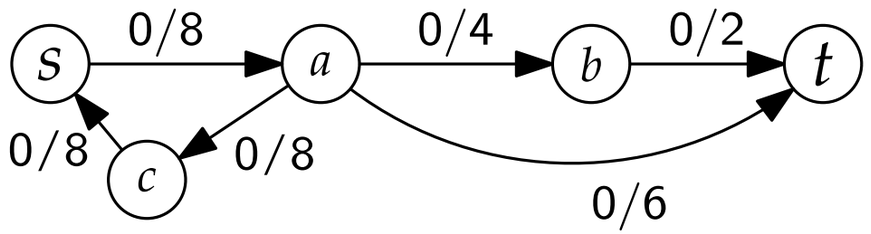

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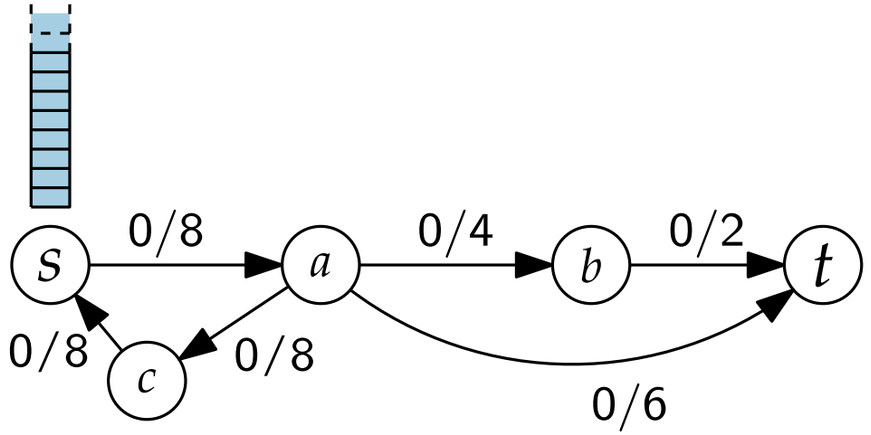

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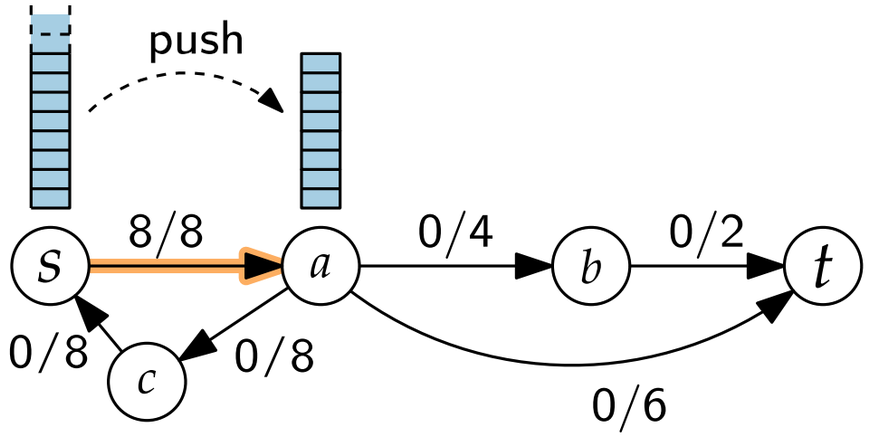

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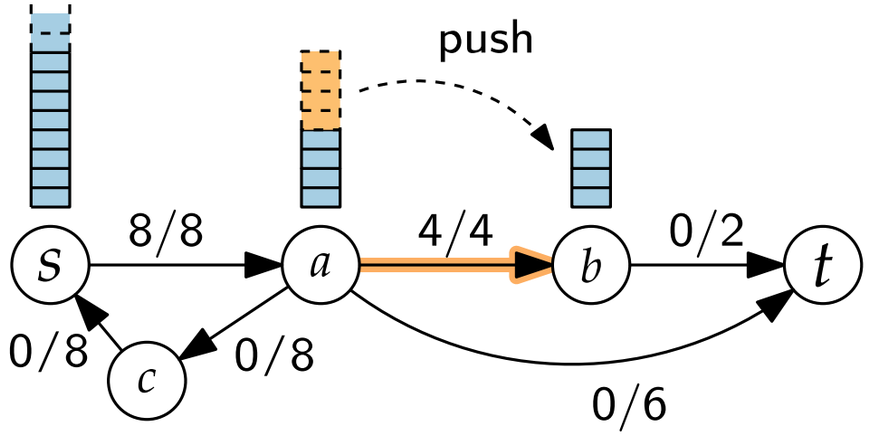

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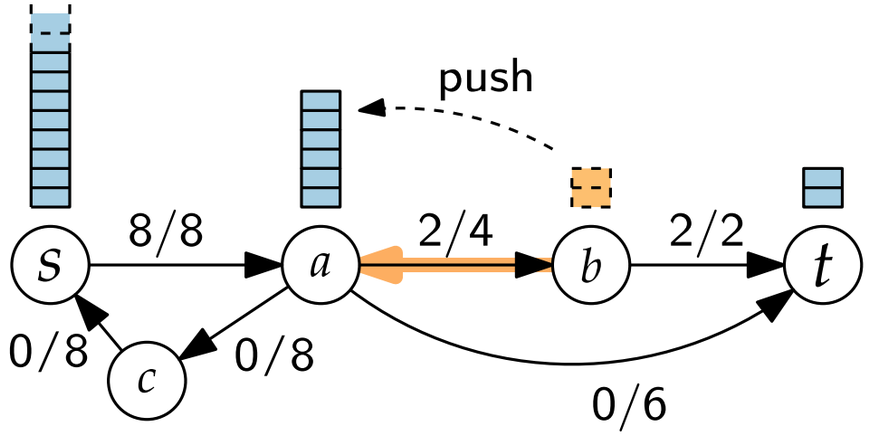

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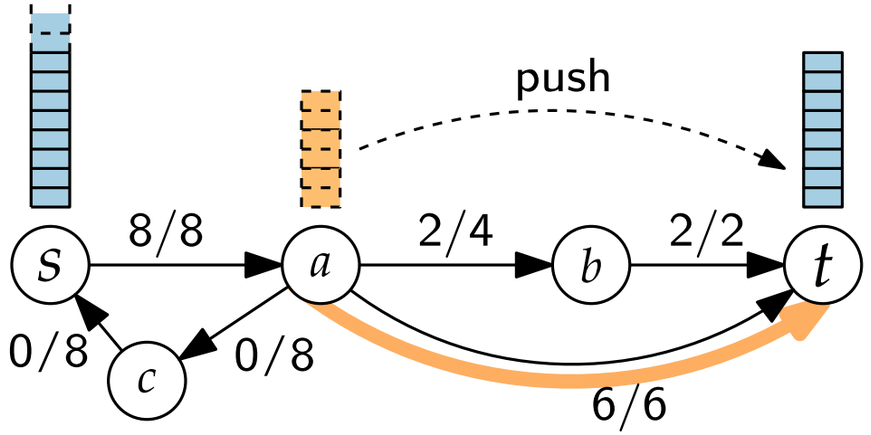

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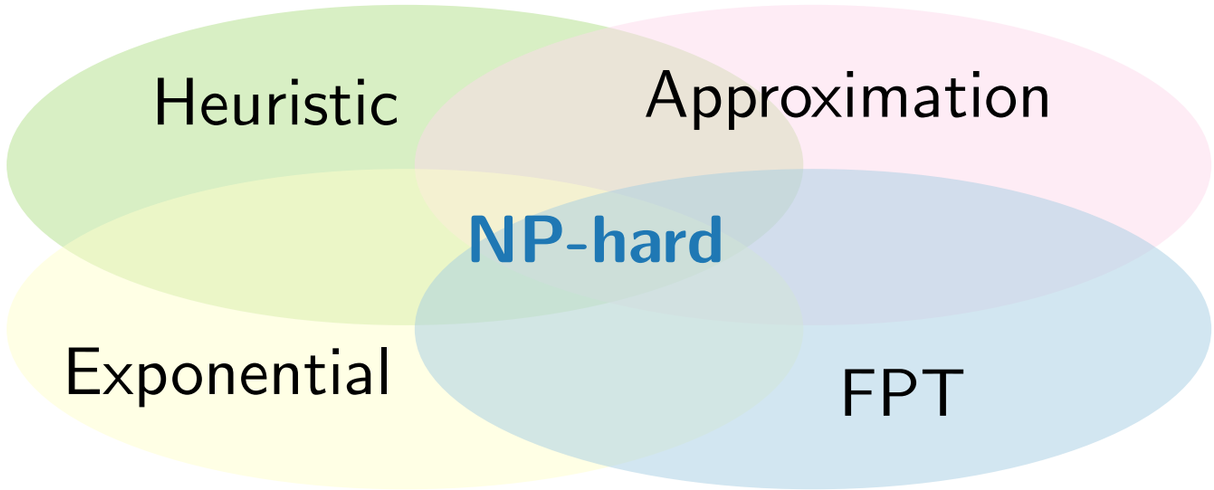

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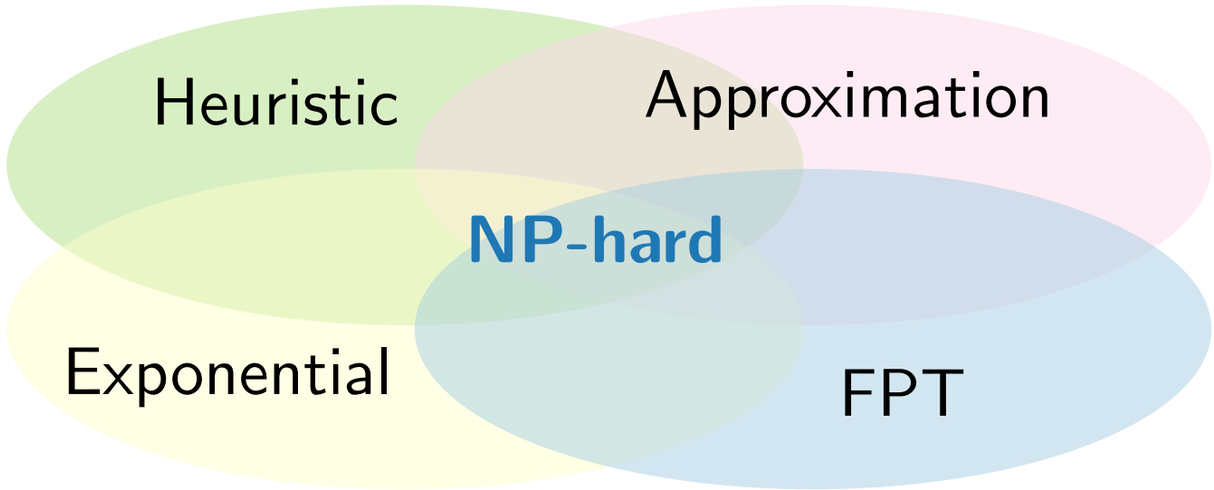

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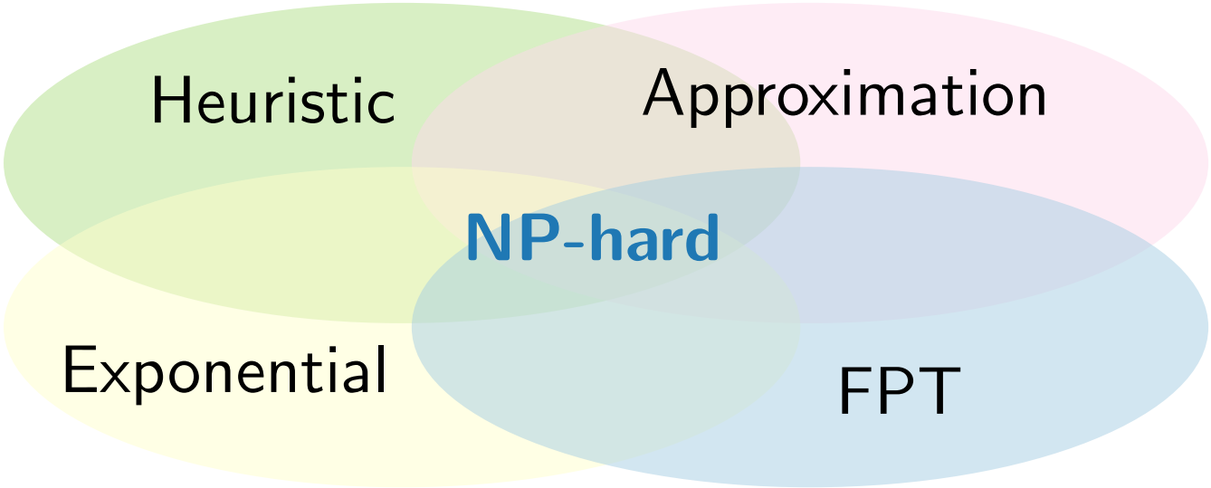

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- Example problem:
  Schedule jobs to machines
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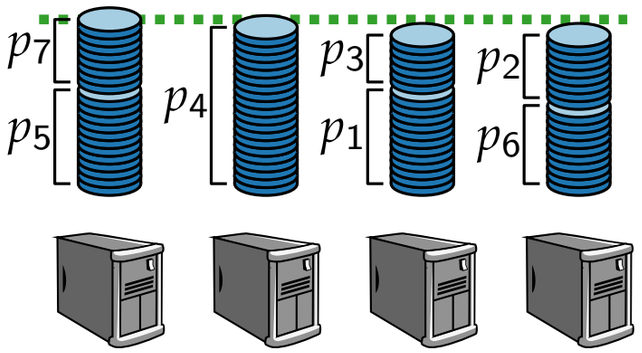

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Randomized algorithms

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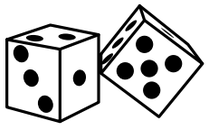

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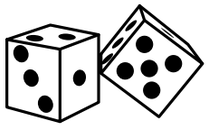

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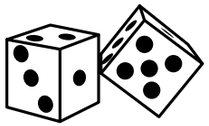

Also

- Online algorithms
- Computational geometry
- Working with strings

Topics IV

- **Advanced data structures**

Searching for strings

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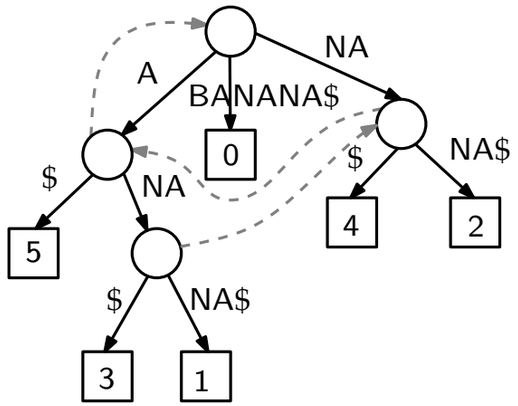

- Suffix trees
- Invest in preprocessing to be faster than full parse

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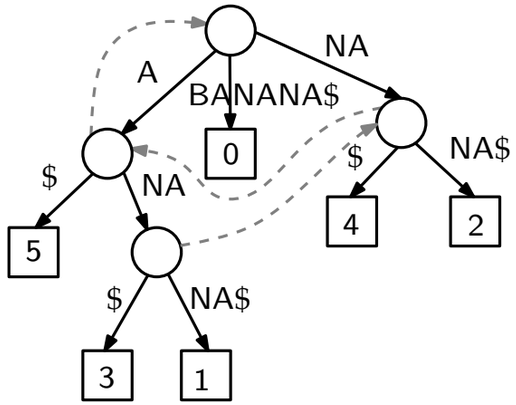

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Also

- Succinct data structures
- Splay trees

Lectures

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- Office: Room 01.007, Building M4 (next to computer science building)

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- In-person lectures Wed, 14:15–15:45, ÜR I
- With time for questions and discussions
- 12 or 13 lectures
- Old videos from 2020 will be made available on WueCampus

Tutorials

- Oksana Firman

- Email: oksana.firman@uni-wuerzburg.de
- Office: Room 01.005, Building M4

- In-person tutorials Mon, 16:00–17:30, HS 4, Physics building
- With time for questions and discussions
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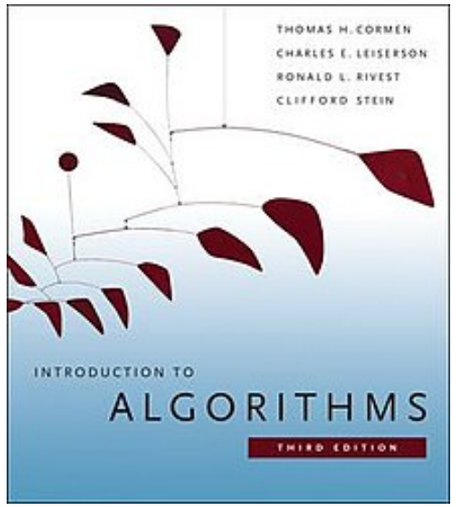
Exercise sheets.

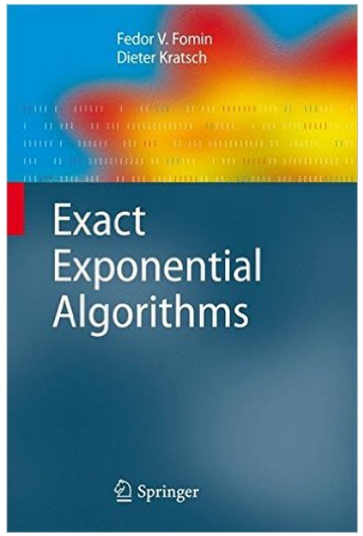
- Weekly exercise sheets, $\approx$ 20 points/sheet
- Scoring 50 % of the points grants a bonus of 0.3 to the final grade of the exam (if one passes)
- Released at the lecture day (Wed)
- Submission deadline next lecture (Wed, 14:15)
- Digital submission as pdf; recommended to use our LaTeX template
- Submission in teams of two . . .
- . . . in English (preferred) or German

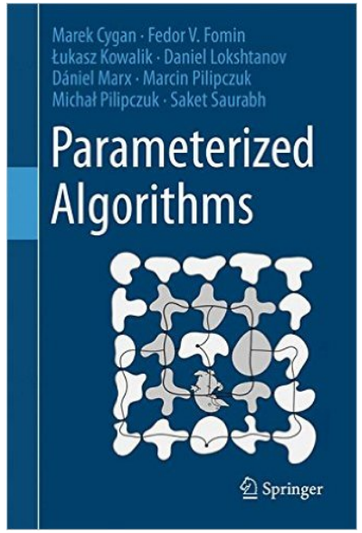
Exam

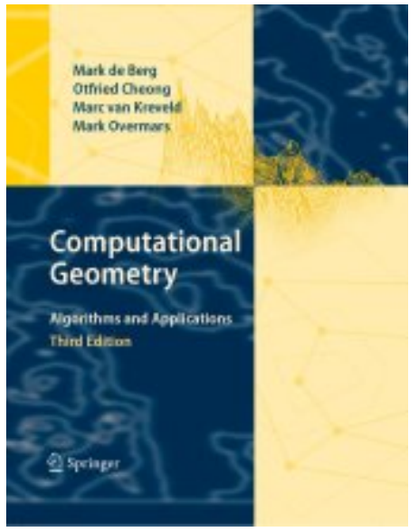
- Oral exam
- $\approx$ 20min
- Bonus for points on the exercise sheets (see previous page)
- Date will be announced during the semester
- Don't forget to register in WueStudy:
  "Ausgewählte Kapitel der ..."

Literature



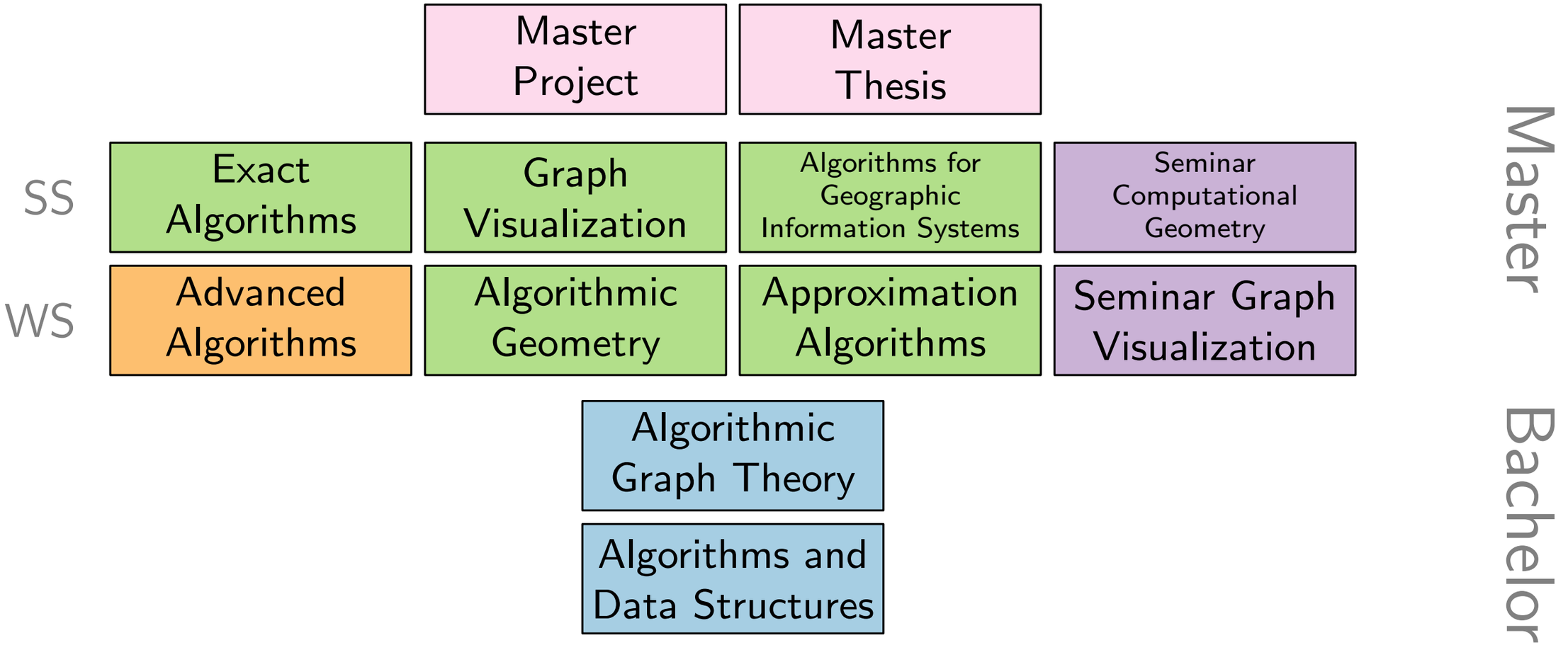






- Sources at the end of every lecture
- Links to further interesting stuff

Our Lectures and Seminars



Thanks

Material and slides provided in this lecture have been compiled
by many different people. Special thanks to:

Jonathan Klawitter, Boris Klemz, Steven Chaplick,
Thomas van Dijk, Philipp Kindermann, Joachim Spoerhase,
Sabine Storandt, Dorothea Wagner, Tim Hegemann,
Alexander Wolff, ...