Karlsruhe Institute of Technology

Hasso Plattner Institut
IT Systems Engineering | Universität Potsdam

Competitive Programming 2

Winter Term 23/24

Intro

Kirill Simonov
Algorithm Engineering Group
HPI

Christopher Weyand
Scalable Algorithms Group
KIT

We are...

Tutors

Master
2334
Konrad Letz

Expert
1882
Tobias Röhr

Grandmaster
2563
Yidi Zang

NWERC 2022

26		Seems to be O(k!) Hasso Plattner Institute	8	973

51	St. Petersburg State University		6

Grandmaster
2498
Kirill Simonov

ACM ICPC World Finals 2015

HPI

Lecturers

Candidate Master
2093
Michael Zündorf

KIT

Master
2124
Christopher Weyand

GCPC2018–22

2		Hasso's Race Mice Hasso-Plattner-Institut	11	1225

Who are you?

- Which semester? Bachelor/Master?

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- ICPC / Codeforces /. . . experience?
- Favorite programming language?

Planning

- Time and place
  - **HPI:** Friday 13:30-. . . in HS3
  - **KIT:** Friday 11:30 in 301

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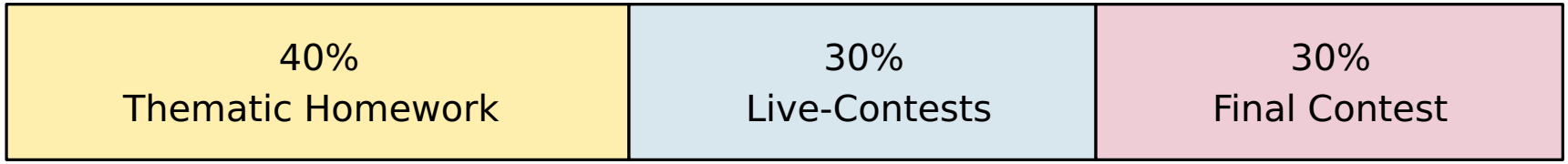
Schedule

- 20.10. Intro (only HPI)
- 27.10. Topic 1: Segment Trees
- 03.11. Topic 1: Segment Trees
- 10.11. Topic 2: Treaps
- 17.11. Contest 1 (13:30 - 15:30)
- 24.11. Topic 3: Trees
- 01.12. Topic 3: Trees
- 08.12. Topic 4: DFS Trees
- 15.12. Contest 2 (13:30 - 15:30)
- 22.12. Topic 5: Flow
- 12.01. Topic 5: Flow
- 19.01. Topic 6: Math
- 26.01. Contest 3 (13:30 - 15:30)
- 02.02. Topic 7: Strings
- 09.02. Topic 7: Strings

Grading



Grading

40% Thematic Homework	30% Live-Contests	30% Final Contest

- topic every two weeks
- 7 problems per topic
- 5 solved for full score
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- must solve 3/4
- 2h time
- work in team of 2
- no carry-over

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Mapping % to Grade:
95%: 1.0
90%: 1.3
85%: 1.7
...
50%: 4.0

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- 5h time
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when solving less than required, score is linearly interpolated. e.g. 5 solved in endcontest is $5/6 \cdot 30\% = 25\%$

Topics

will do no time :(

DFS Tree

bridges

2-edge-connected components

cut-vertices

2-vertex-connected components

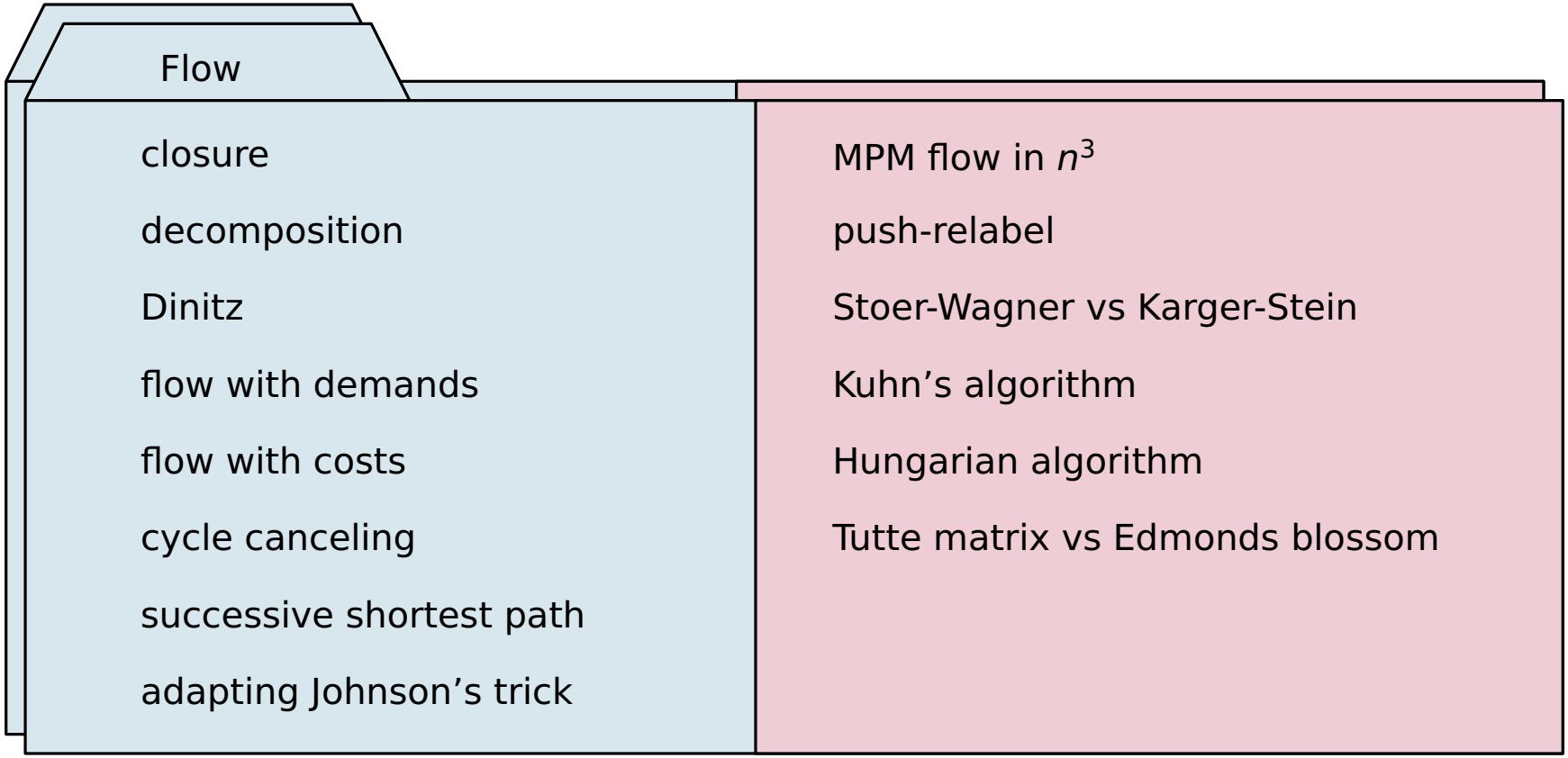
strongly connected components

Online Bridge Finding

euler tour, path

Topics

will do no time :(



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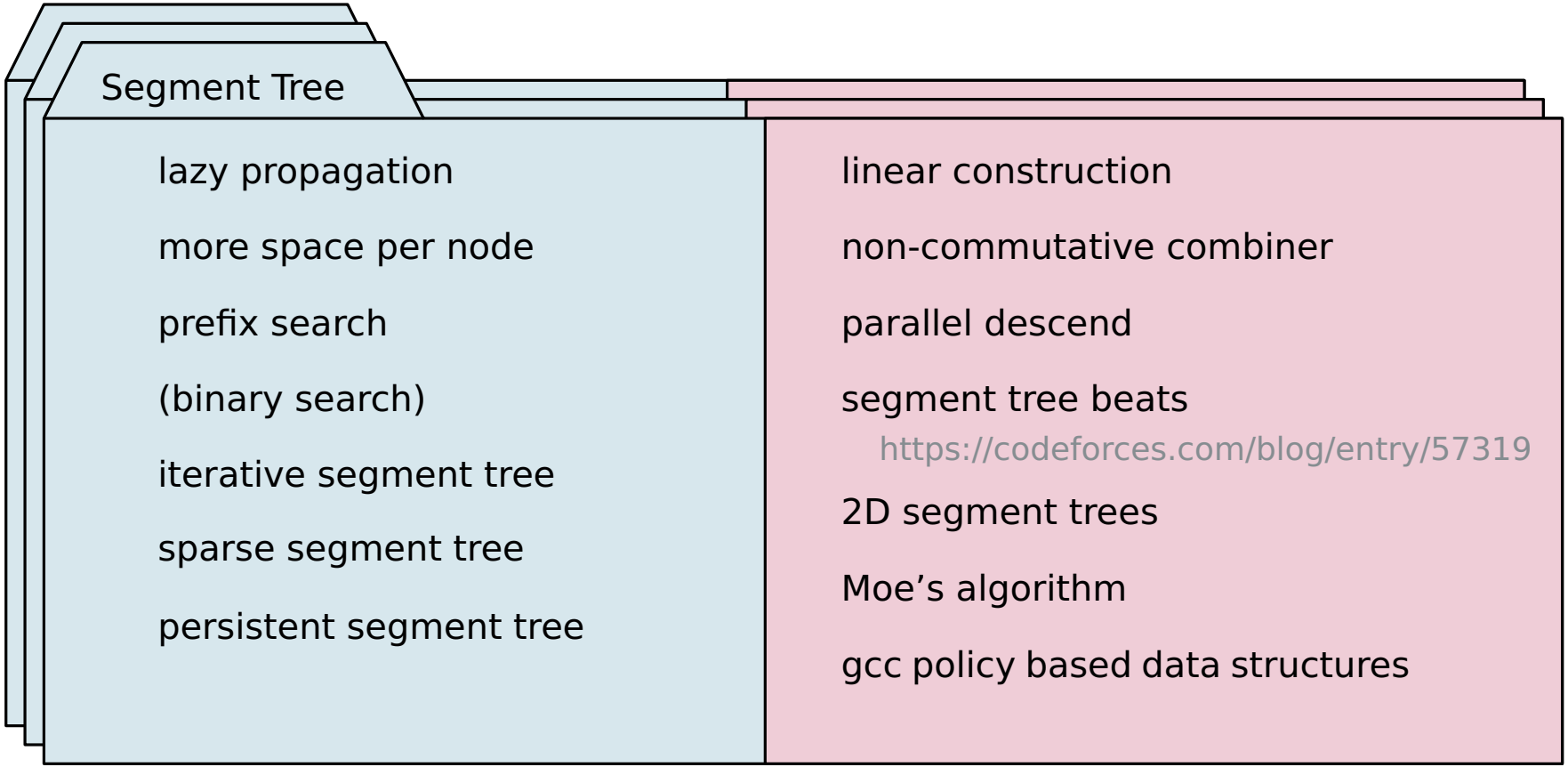

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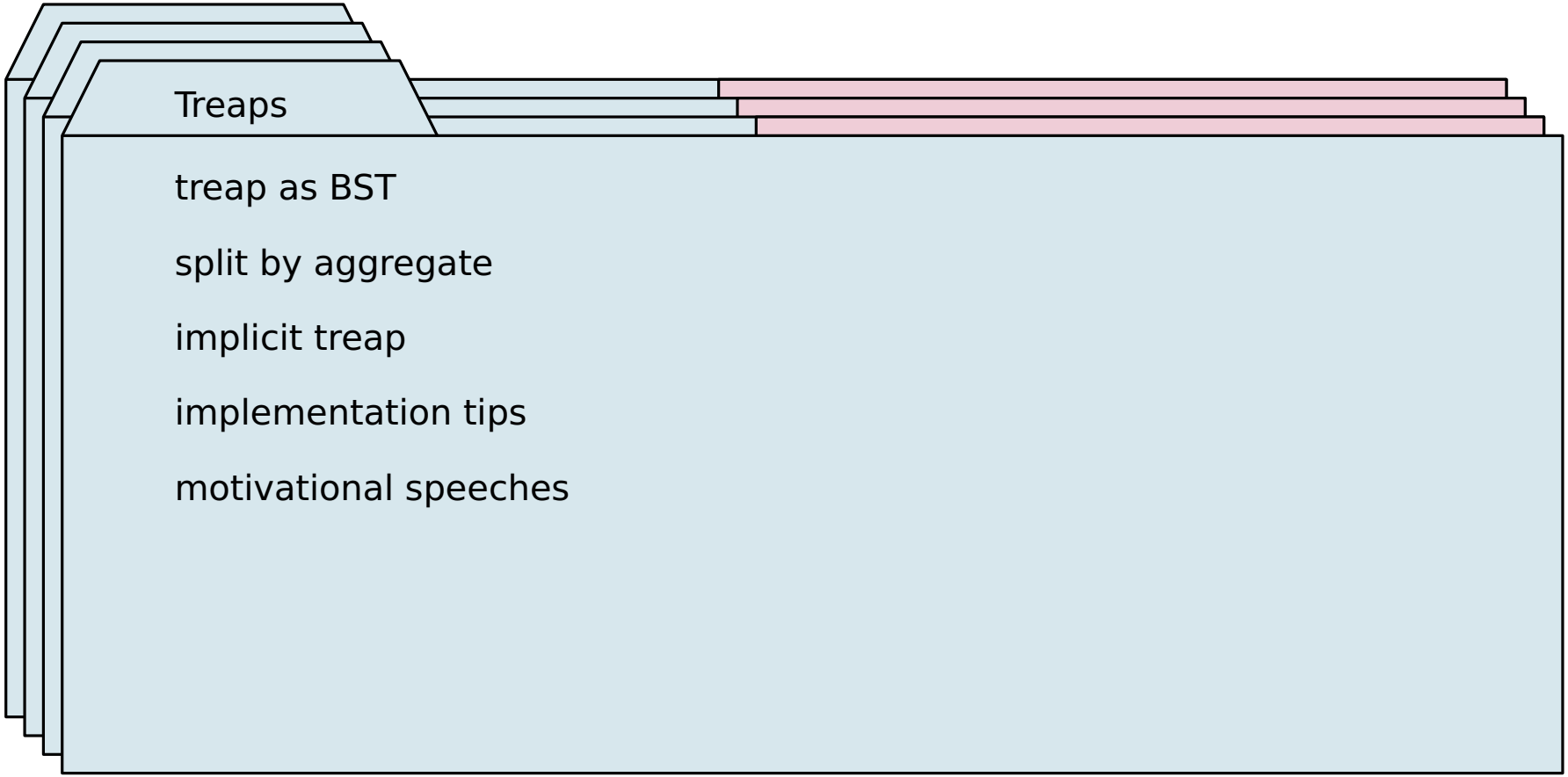

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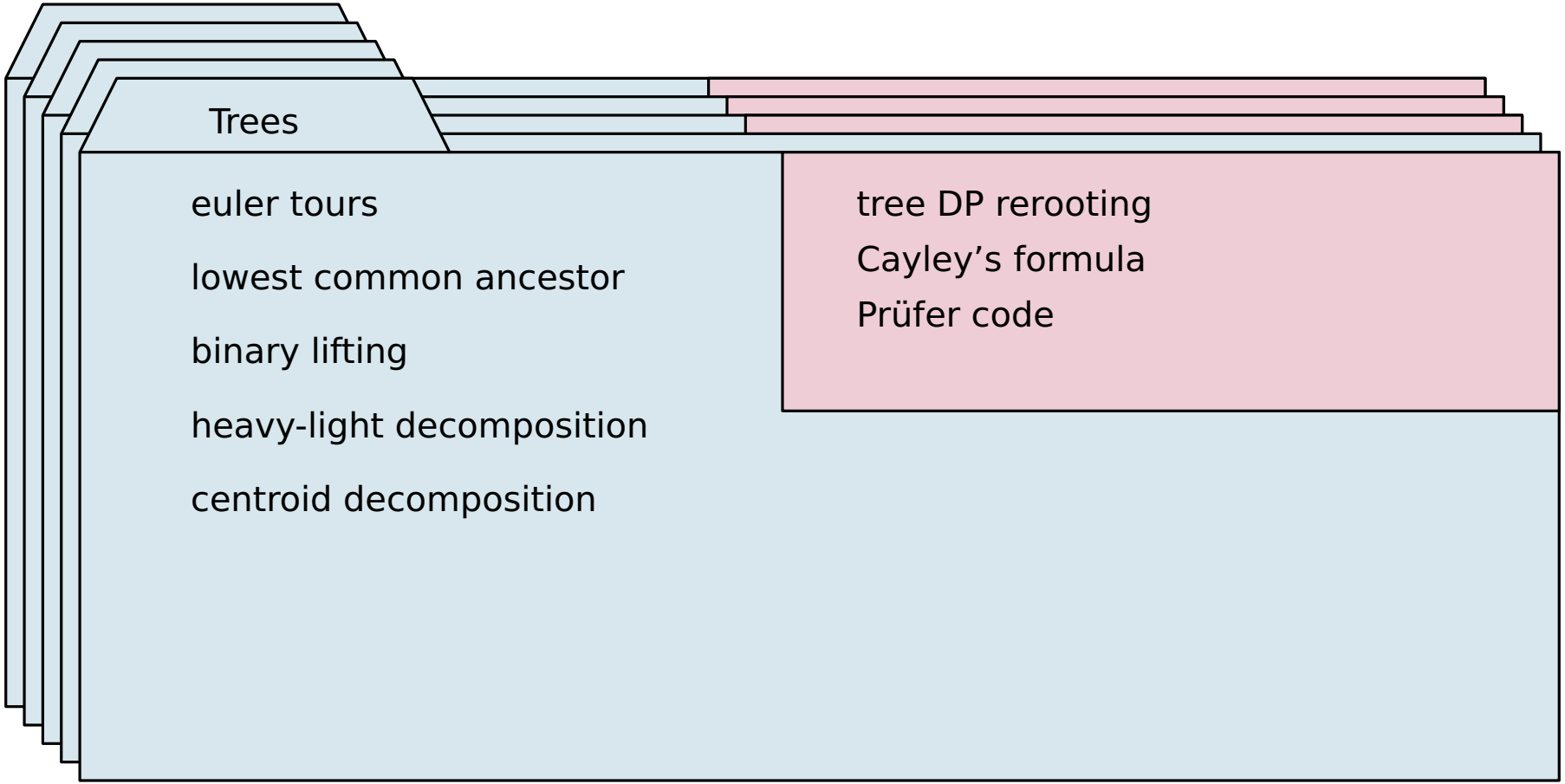

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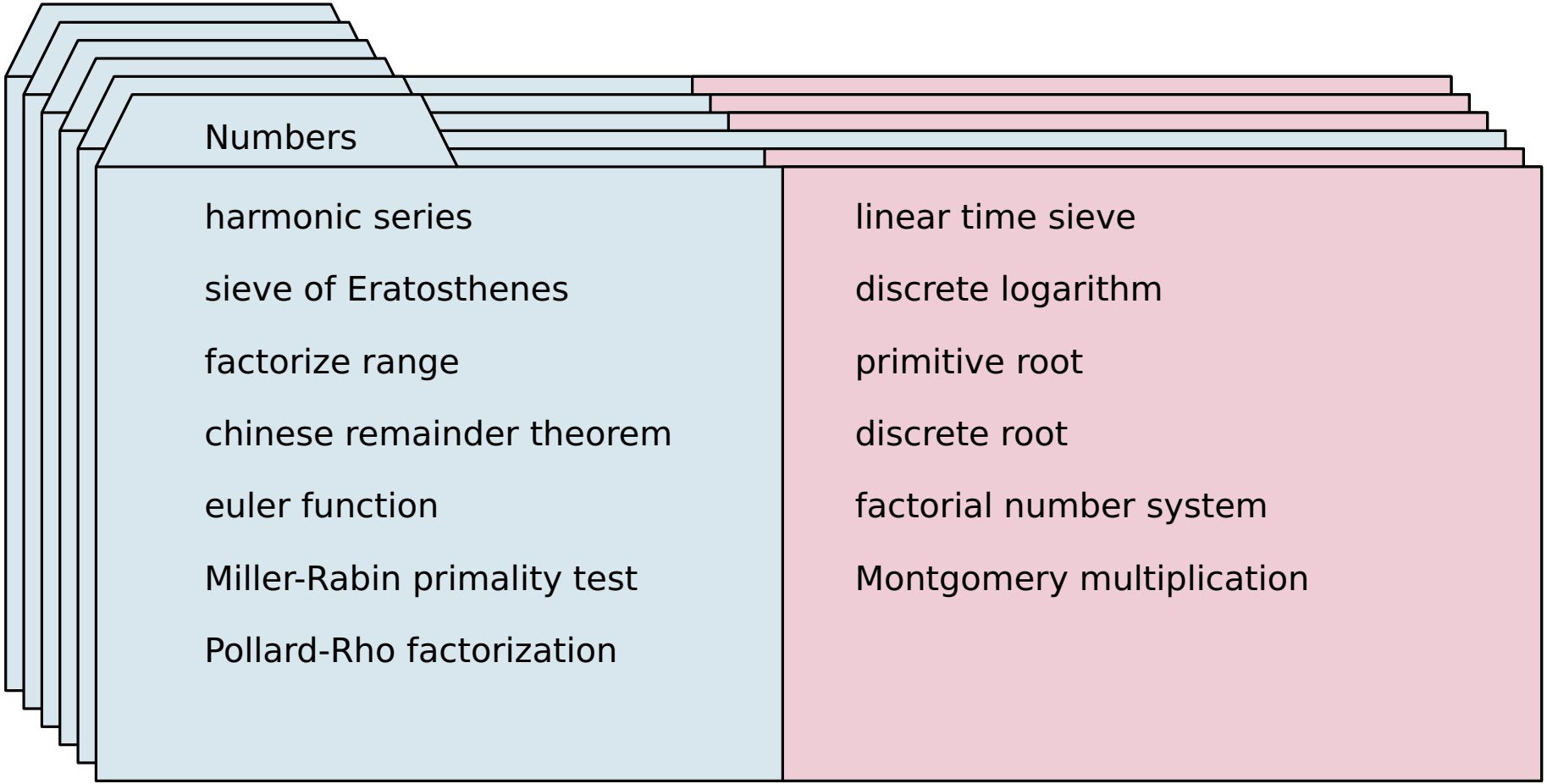

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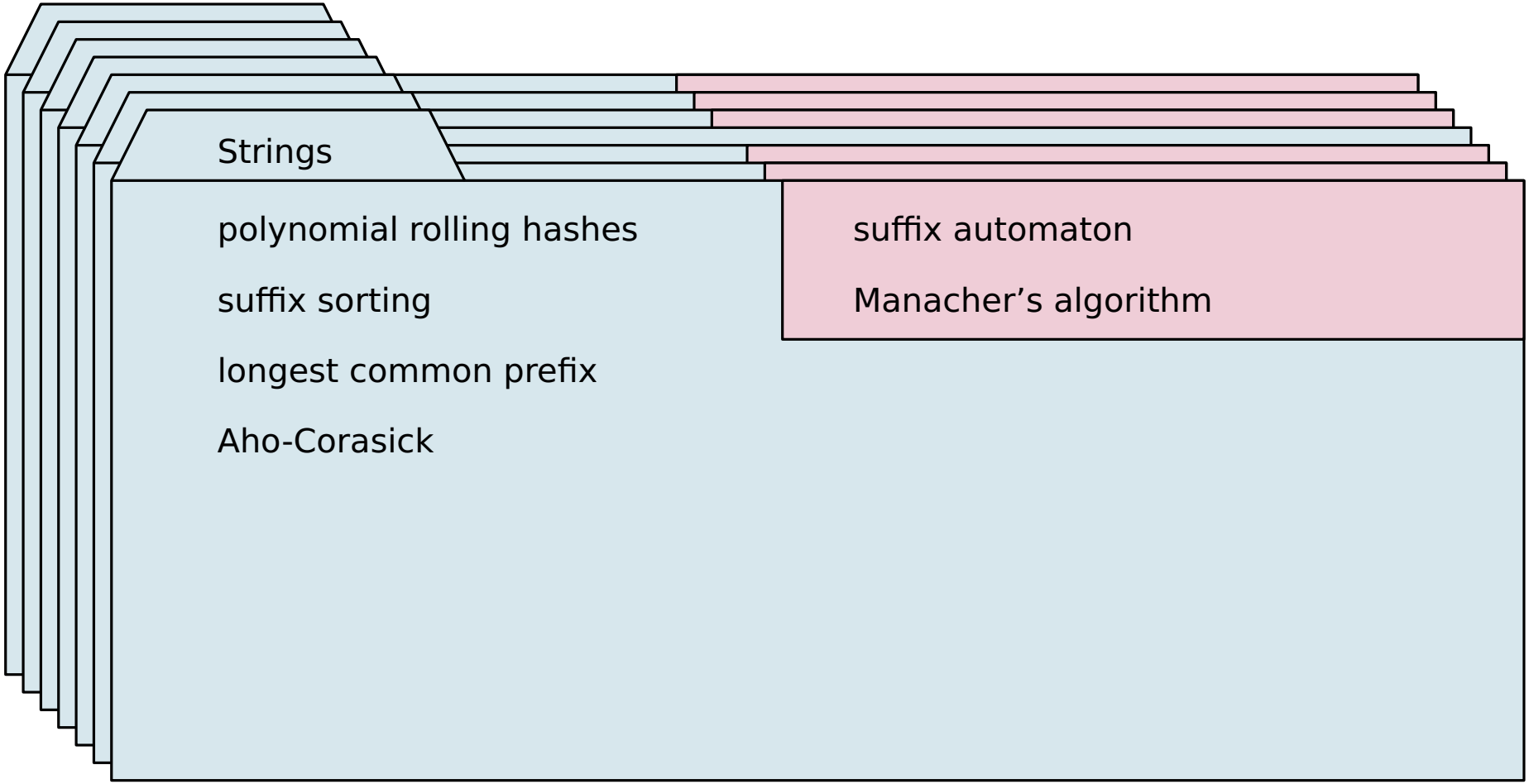

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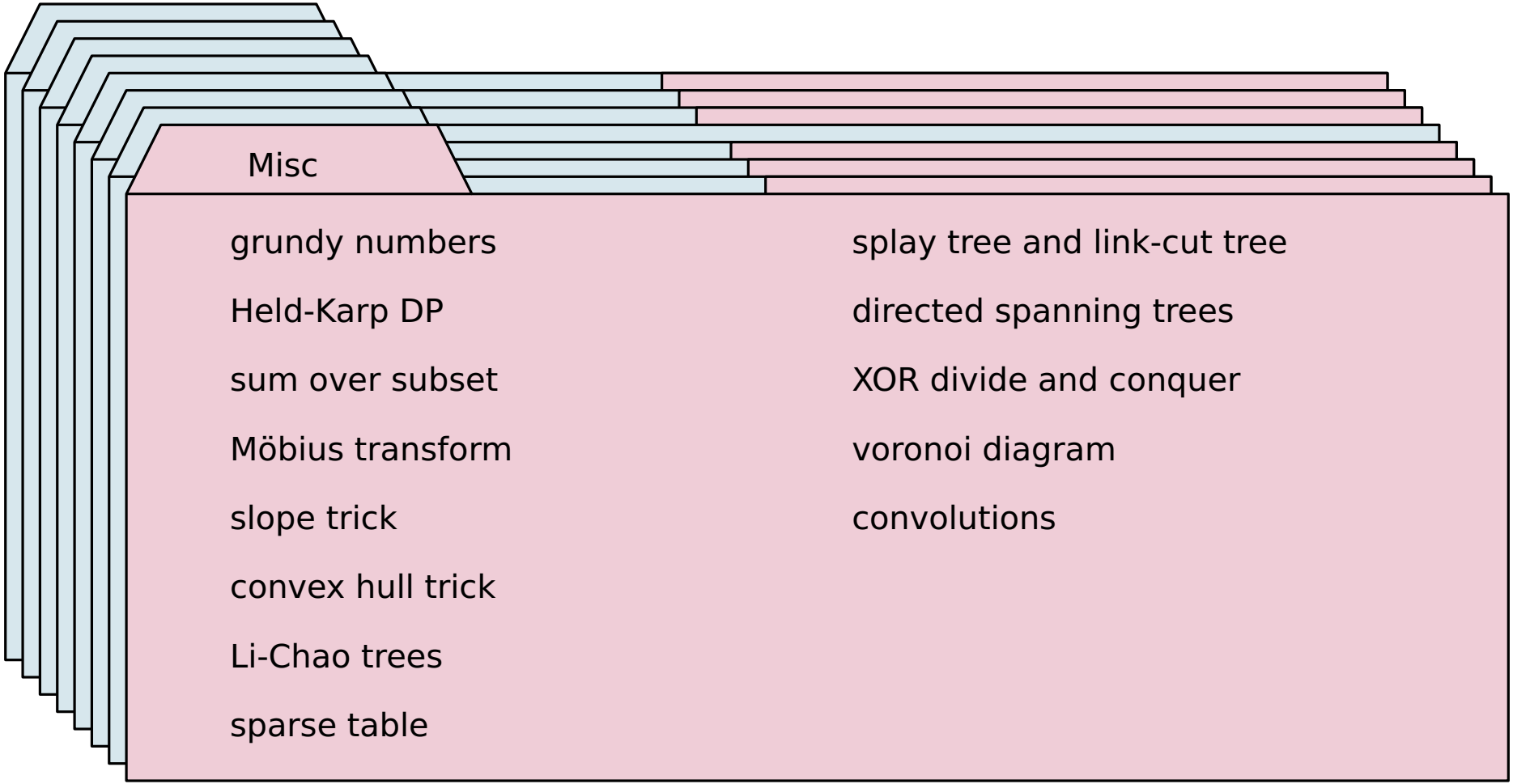

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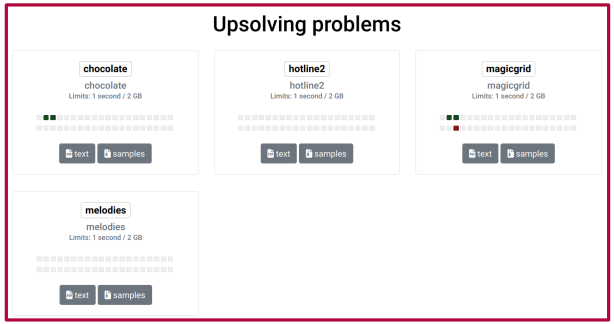
- Finally, start solving the segment tree problems



Not enough problems?

- Take part in competitions online!

CODEFORCES
Sponsored by TON

Codeforces

HOME TOP CATALOG CONTESTS GYM PROBLEMSET GROUPS RATING EDU API CALENDAR HELP ICPC CHALLENGE

Current or upcoming contests

Name	Writers	Start	Length		
Codeforces Round 904 (Div. 2)	74TrAkToR	Oct/22/2023 09:05 UTC+2	02:00	Before start 43:56:54	Register » x1637 Until closing 43:51:54 *has extra registration
Codeforces Round 905 (Div. 1)	74TrAkToR Mangooste TheEvilBird Tikhon228 teraqqq valerikk	Oct/22/2023 13:05 UTC+2	02:00	Before start 47:56:54	Register » x324 Until closing 47:51:54 *has extra registration
Codeforces Round 905 (Div. 2)	74TrAkToR Mangooste TheEvilBird Tikhon228 teraqqq valerikk	Oct/22/2023 13:05 UTC+2	02:00	Before start 47:56:54	Register » x983 Until closing 47:51:54 *has extra registration
Codeforces Round 905 (Div. 3)	74TrAkToR	Oct/22/2023 13:05 UTC+2	02:00	Before start 47:56:54	Register » x8387 Until closing 47:51:54 *has extra registration
Codeforces Round (Div. 1)		Oct/28/2023 16:35 UTC+2	02:30	Before start 8 days	Before registration 4 days
Codeforces Round (Div. 2)		Oct/28/2023 16:35 UTC+2	02:30	Before start 8 days	Before registration 4 days
Codeforces Round (Div. 2)		Oct/30/2023 16:35 UTC+2	02:00	Before start 10 days	Before registration 8 days
Codeforces Round (Div. 1)		Nov/07/2023 16:35 UTC+2	02:00	Before start 3 weeks	Before registration 2 weeks
Codeforces Round (Div. 2)		Nov/07/2023 16:35 UTC+2	02:00	Before start 3 weeks	Before registration 2 weeks
2023 ICPC Post-World Finals Challenge powered by Huawei		Nov/20/2023 09:00 UTC+2	14:00:00	Before start 4 weeks	Register » x4504 Until closing 6 weeks

AtCoder

Upcoming Contests

Start Time	Contest Name
10/21(Sat) 14:00	AB KEYENCE Programming Contest 2023 Autumn（AtCoder Beginner Contest 325）
10/28(Sat) 14:00	AB Panasonic Programming Contest 2023（AtCoder Beginner Contest 326）
11/4(Sat) 13:00	AB HHKB Programming Contest 2023(AtCoder Beginner Contest 327)
11/5(Sun) 07:00	H Toyota Programming Contest 2023#6（AtCoder Heuristic Contest 021）
11/11(Sat) 13:00	AB Toyota Programming Contest 2023#7（AtCoder Beginner Contest 328）
12/2(Sat) 13:00	AB Daiwa Securities Co. Ltd. Programming Contest 2023（AtCoder Beginner Contest 331）