Competitive Programming
Winter Term 23/24

Live Contest: Rules and Tips

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Final Contest

- the contest is next Tuesday (21.02.2023) from 10:00 to 15:00
  - be there 15 min early
  - solutions are presented afterwards
- for KIT, contest will be in room -101
- problems can be from all covered topics
  - flows
  - data structures
  - trees
  - numbers
  - strings
- unrated topics are excluded
  - DFS
  - FFT
Live Contest Rules

- Use multiple computers at the same time
- Use any software/IDE, Python+C++
- Talk within the team
- Ask the teaching team for clarifications and hints
- Use slides from the course
- Use your **own** code from previous problems
- Use public information from the internet
  - Please cite copied code with the source in a comment
- Do not post on the internet
- Do not talk to anyone outside your team and teaching team
Live Contest Ranking + Grading

Ranking (for prestige)
- Number of solved problems
- Sum of problem penalties
  - Per solved task: (time since contest start in min) + 20 min · (number of fails before first correct solution)

Grading (for ECTS)
- Solve 6 out of 8 tasks for full 30%
  → 5% per solved task
- 7th and 8th tasks have no effect, but more choices
Live Contest Tips

- Bring snacks + water
- Bring pencil+paper
- Set up IDE
- Have reading material ready

- Read all tasks
- Draw examples
- Talk to your partner!
- Use pair programming
- Look at the scoreboard
- Don’t look at the scoreboard

Have fun!
Contest Checklist

Wrong Answer

- check for overflow
  - int until 2e9; long long until 9e18
- check for overflow again; even long, size_t can be 32 bit
- make sure IO is not optimized
- edge case missing? e.g. n=0
- discuss solution with pair programming partner again
- If you did greedy, better try DP

Timelimit

- ios::sync_with_stdio(false)?
- compute worst case number of operations in python shell
  - >≈100kk is too slow. You get a feel for these numbers!
- change std::endl to ‘\n’
  - have a look at Jason Turner’s “C++ Weekly - Ep 7 Stop Using std::endl”
- passed container by value?
  - check that input and output are not interleaved; or use cin.tie(nullptr)
  - discuss solution with pair programming partner again
Contest Over. What now?

- you are now perfectly trained to represent your university in ICPC competitions
- Wintercontest, GCPC, NWERC are every year
- consider joining our student community and keep training
  - join the discord server
    discord.gg/fAu5QM6CBx
  - attend our weekly meetings
    Do 15:00 in 305
  - be active on codeforces
  - remember us after winning World Finals
Don’t think I would let you go this easy.

Given array of length $n \leq 10^5$. Answer $q \leq 10^5$ range queries that ask for the number of unique elements in a subarray.

5s timelimit
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Hint: $O(n\sqrt{n} \log n)$