Introduction to ACM-ICPC and CCPC

The University of Hong Kong
Department of Computer Science
SUN Bintao
Outline

• Introduction to ACM-ICPC and CCPC
• Upcoming contests
• Practice and training
Introduction to ACM-ICPC and CCPC
What are they?

- ACM International Collegiate Programming Contest.
- Official site: [https://icpc.baylor.edu/](https://icpc.baylor.edu/)

- The Association for Computing Machinery (ACM) is an international learned society for computing. It is the world's largest scientific and educational computing society.
What are they?

• China Collegiate Programming Contest.
• Official site: https://ccpc.io/
• The 1st CCPC was held in 2015.
Basic rules

• Solve about 10 programming tasks in 5 hours.
• 3 members per team.
• 1 computer.
• C++ or Java.
Question style

• Problems are mathematically well-defined, with data range and input/output specifications.

• Example: [http://poj.org/problem?id=1001](http://poj.org/problem?id=1001)

• No GUI, network etc. are needed. Actually they are not allowed.

• For C++, all you need is iostream and STL.
How is it judged?

• Only source code is submitted and judged.

• Data-based judging. Your source code is compiled and run by the judge. The judge uses a preset dataset as input, and compare your output against the referenced answer.
How is it judged?

- Your solution is judged as correct (AC - Accepted) only if
- It compiles successfully. Otherwise CE - Compile Error.
- It does not crash. Otherwise RE - Runtime Error.
- It uses limited amount of memory. Otherwise MLE - Memory Limit Exceeded.
- It terminates within the time limit. Otherwise TLE - Time Limit Exceeded.
- It outputs all the correct answers. Otherwise WA - Wrong Answer.
An example

• http://poj.org/status
How are teams ranked?

• Teams are firstly ranked according to the number of problems solved, then the total time used.

• The **total time** is the sum of the time consumed for each problem solved. The time consumed for a solved problem is the **time elapsed** from the beginning of the contest to the submittal of the first accepted run plus **20 penalty minutes** for every previously rejected run (Compile Error excluded) for that problem.
Example

• Suppose you have the following submissions:
  • The 12th minute, problem A, correct;
  • The 34th minute, problem B, incorrect;
  • The 56th minute, problem C, incorrect;
  • The 78th minute, problem B, correct;
  • The 90th minute, problem A, incorrect.

• Then your time consumed is 12 for problem A, $78 + 20 \times 1 = 98$ for problem B and 0 for problem C. Your total time is thus 110.

• Contestants can check ranks in real time.

• Example: https://icpc.baylor.edu/scoreboard/
Contest structure of ICPC

• University selection
  • We will select 3 teams this year.

• Asia regional contests (East Continent sub-region)
  • Our main battle field.

• World finals
  • Top teams in regional contests advance to world finals. About 120 teams in total around the world.
Skills required

• Coding. Implement whatever algorithm you have in mind.
• Algorithm design. Knowledge of classic algorithms and algorithm design techniques. For example, Dijkstra’s algorithm and dynamic programming.
• Programming and debugging onsite under pressure.
Upcoming contests
Contest plan

• We plan to select 3 teams.
• ICPC rules: each team can go to at most 2 regional contests (weekends in Oct and Nov) + East Continent Final (Dec 14-15).
• Usually, a silver medal or above at any regional site can secure a ticket to EC Final. Sometimes a bronze medal is also enough.
• CCPC (Final): Nov 16-17.
Contest plan

• Depending on budget and results of online preliminary contests, each team will go to 1 or 2 contests + ICPC EC Final.

• We usually depart on Friday and return on Monday by plane.
Contest plan

• Nov 16 - 17
  • 1 team goes to Shenyang for ICPC Asia Regional Contest
  • Maybe 1 team goes to Beijing for CCPC Final

• Nov 23 - 24
  • 3 teams go to Shanghai for ICPC Asia Regional Contest

• Nov 30 - Dec 1
  • 2 teams go to ICPC Asia Hong Kong Regional Contest

• Dec 14 - 15
  • Qualified teams go to Xi’an for ICPC EC Final
ICPC online preliminary contests

• Shenyang: Sep 14; Shanghai: Sep 15. 12:00 – 17:00.
• Everyone is welcomed; top 9 students are encouraged.
Selection contest

• Planned on **September 12 (Thu), 7:00 pm - 9:30 pm.**
  • Individual contest.
  • Rank by ICPC rules.
  • Printed/written notes are allowed.
  • Contest environment: PC², [https://pc2.ecs.csus.edu/](https://pc2.ecs.csus.edu/)

• Contestants ranking **top 9** will be qualified to represent HKU to participate in the contests.

• Practice contest: September 10 (Tue), 7:00 pm – 8:00 pm.
  • Not mandatory.
Practice and training
Being self-motivated

• You join us because you are interested in programming contests, and you can leave at any point if you are not any more.

• We assist you to participate in the contests, including organizing online training sessions.

• However, we do not and cannot force you to do anything. You have to be **self-motivated**.
Your benefits

- Opportunity to participate in ACM-ICPC and CCPC.
- The department appoints a TA (Bintao SUN) for you to consult, regarding the competition and solving programming problems.
- Good prize helps in finding a good job in industry.
- Meet new friends that have the same interest with you.
Practice

- Online judge
- Codeforces: https://codeforces.com/
- Peking University Online Judge (many classic problems, some are a little bit outdated): http://poj.org/
- ACM-ICPC Live Archive (past contest problems): https://icpcarchive.ecs.baylor.edu/
- Etc.

- Virtual judge (DIY contests): https://vjudge.net/
Training plan – this semester

• We organize practice contests regularly, aiming for this year's regional contests.
• Team contest. Follow ICPC rules.
• Problems selected from past regional contests.

• If you are new, you can find some resources in [http://i.cs.hku.hk/~provinci/training.html](http://i.cs.hku.hk/~provinci/training.html)
Training plan – next semester

• Mainly for beginners.
• We collect some online problems to talk about algorithmic topics.
Consultation

• Send me an email if you have any questions about the contest, both technical and non-technical.
  • Bintao SUN, btsun@cs.hku.hk

• Appoint with me if you need face to face consultation.

• Our website: https://i.cs.hku.hk/~provinci/
Any questions?