CEOI 2022 – Competition Rules

Task Types

The tasks are designed to be algorithmic in nature. They may be of the following type:

- **Batch** – Solutions consist of a single source file of a computer program which reads data from standard input and writes its answer to standard output.
- **Interactive** – Solutions consist of a single source file of a computer program which interacts with a *grader* program provided by the organizers. The interactive interface will be implemented via standard input and output.
- **Output-only** – The contestants are given input files and they have to produce correct output files by any means available.

Due to some delegations participating online, there will be no output-only tasks on CEOI 2022.

Competition Format

There will be two competition days. On each day contestants will be given three tasks to complete in five hours.

Limits

For batch and interactive tasks, the following limits are enforced:

- A contestant can make at most 50 submissions per task.
- Submission size is limited to 20 kiB, unless otherwise stated in the task description.
- Compilation has to run within 30 seconds and within 4 GiB of memory.
- Each task has a given time limit: a limit on the total processor time the solution may consume while solving a single test input.
- Each task has a given memory limit: a limit on the total amount of memory the solution may have allocated at any moment. This limit includes not only the variables but also the executable code, global data, the stack, etc.
- There is no separate stack size limit.

Submitting Solutions

Contestants submit solutions to the contest server via a web-based judging system running on that server.

Solutions for tasks may be submitted at any time during the contest. For each task a contestant may make at most 50 submissions. It is the responsibility of the contestants to submit their solutions to the contest system before the contest is finished. We advise the contestants to reserve enough time before the end of the contest to make sure that all of their solutions are submitted. The contest server shows the official time remaining in the contest.

For tasks that require programs as solutions, the judge will accept C++ and Python source files.

Scoring

Test data for each task will be divided into batches of test cases that correspond to the subtasks defined in the task statement. A single test case is solved correctly if the submitted program produces the correct output within the enforced limits. A subtask is solved correctly if each of the test cases it contains is solved correctly. The individual score for each subtask will be specified in the task statement.

If a contestant submits more than one solution for the same task, the final score for each subtask will be the maximum score of this subtask across all submissions. The final score for each task will be the sum of scores for its subtasks For example, consider a contestant who made two submissions on a task that contains two subtasks. The first submitted solution got 30 points for the first subtask and 10 points for the second subtask, the second solution got 0 points for the first subtask and 40 points for the second subtask, then the final score for this task will be 70).

Each submission is always tested on all example test cases. The results of these tests have no influence on the scores. In particular, it is possible to fail an example test case and still gain a non-zero score for the task.

Feedback

For each submission, the contestant will receive full feedback. Namely:

- Compiler output.
- The verdict and score for each subtask.

If a subtask is not solved, then the judging system will give feedback for the first test case which was not solved correctly. The feedback will be one of the following:

- Partially correct: The submission was executed within all limits and produced a partially correct solution for the test case.
- Wrong answer: The submission was executed within all limits and produced an incorrect solution for the test case.
- Time Limit Exceeded: The submission didn't execute within the time limit.
- Memory Limit Exceeded: The submission didn't execute within the memory limit.
- Output Limit Exceeded: The submission outputted more data than allowed (256 MiB).
- Returned non-zero: The submission terminated its execution with a non-zero exit status.
- Terminated (signal name): The operating system terminated the submission with the specified signal.

Inputs are ordered the same way in all the runs. No information on the actual data, number of passed test cases, program output, or any other execution details will be given to the contestant.

A correctly solved subtask will receive a **Correct** verdict.

Clarification Requests

During the competition, contestants may use the judging system to submit clarification requests. Contestants may use English or their native language. Delegation leaders are responsible for translations between the native language and English.

Task-related questions must be phrased as positive yes/no questions. These questions will be answered with one of the following:

- YES
- NO
- ANSWERED IN TASK DESCRIPTION (EXPLICITLY OR IMPLICITLY): The task description contains sufficient information. The contestant should read it again carefully.
- INVALID QUESTION: The question is not phrased so that a yes/no answer would be meaningful. The contestant is encouraged to rephrase the question.
- NO COMMENT: The contestant is asking for information that the Scientific Committee cannot give.

Technical and contest-related questions and comments may be phrased arbitrarily and the Scientific/Technical Committee will answer them appropriately

Announcements

The Scientific Committee may need to make an announcement during the competition. These announcements will be made in English and they will be published on the judging system. If a contestant cannot understand the English announcement, they can send a clarification request asking for a translation.

Fair Play

In order to ensure fair competition, submitted programs are not allowed to:

- use libraries that are not related to solving the problem (libraries for graphics, networking, etc.)
- execute other programs
- access the network
- read or write files not described in the task description

- attempt to subvert the security of the grader

During the contest, contestants are not allowed to:

- access any workstation other than the one assigned to them
- access the network for anything other than communicating with the judging system
- attempt to overload the judging system or attack its security in any way
- attempt to reverse engineer the test data by abusing the provided feedback
- communicate with persons other than CEOI staff or onsite proctors
- reveal their passwords
- intentionally damage or endanger any part of the competition environment
- reboot their workstation
- use any printed and/or electronic materials that are not explicitly allowed

All Fair Play limits do apply during the practice session as well. Violation of these rules may be grounds for disqualification.

Competition Supplies

During the contest days, the onsite proctors will provide:

- pens and blank paper
- snacks and drinks

During the practice session and analysis mode, contestants may bring anything they like. During the contest, contestants may only bring the following items:

- writing utensils
- simple wristwatches
- non-wireless keyboards and mice
- small mascots
- English dictionaries
- clothing and reasonable jewelry
- snacks that can be consumed without disturbing other contestants

During the onsite practice session all keyboards, mice, mascots and dictionaries must be submitted to the onsite proctors for approval before they can be installed and used. After the practice session, and again after the analysis session after day 1, these items must remain on the contestant's desk. After the second competition day, the contestant is responsible for collecting all their belongings.

Any attempts to bring any other items unlisted above into the competition rooms are considered cheating. In particular, the following items are strictly prohibited in the competitions:

- any computing equipment (keyboards with memory, calculators, laptops, tablets, smartwatches, …)
- any books, manuals, written or printed materials
- data storage media (USB drives, flash cards, …)
- communication devices (mobile phones, radios, …)

Appeal Process

During the analysis session after a contest day, the secret test data will be made available to the contestants and delegation leaders. Contestants and team leaders may use the contestant workstations to verify that the grading is correct.

A team leader must notify the Scientific Committee about any appeals before the end of an analysis session, and then submit the full text of the appeal in the time specified by the Scientific Committee.

Every appeal will be reviewed by the Scientific Committee and the team leader will be notified about the committee's decision. All appeals and their resolutions will be summarized at a General Assembly meeting.

In the event that a mistake is discovered in the grading of a task, the mistake will be corrected and the submissions of all contestants will be re-graded and re-scored, whether or not the scoring of that particular submission has been appealed. Note that re-scoring may result in a higher or lower score for any contestant.