



15th International 24-hour Programming Contest

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Preliminary Electronic Contest

Welcome to the testing round of the Jubilee 15th International 24-hour Programming Contest!

This document is the problem set for the Preliminary Electronic Contest to be held on February 21st, 2015.

The PreEC provides a way for teams to familiarize themselves with our submission system and the general atmosphere of the competition. Whether teams participate in this testing round or not, or whatever results they achieve, will not have any consequences later in the competition.

The two problems we selected for the PreEC may not be the kind of problems you would consider especially challenging, however they provide some clues about the Electronic Contest - the required tools, the usage of our submission system and so on.

Rules

The Preliminary Electronic Contest contains three problems. You have all the time in the world to solve them, but we take submissions from 10:00 to 20:00 CET. The inputs of the problems can be found in a zip file that you have probably already downloaded from the website. Each problem will have exactly 10 test cases.

You can use any platform or programming language to solve the problems. We are interested only in the output files, you don't need to upload the source code of the programs that solved them. Once you are done, you can upload your output files via the submission site: <http://sub.ch24.org/sub/>. Your solutions will be evaluated on-line.

Problems are scored in three major ways:

- **Time** scoring: these problems have exact solutions. When submissions to these are evaluated, a final score is given immediately. From one team, only one correct submission will be accepted for each input (since the input is either solved or not). Given score decreases with time until the end of the contest, so faster solutions get more points.
- **Competitive** scoring: problems that do not have a known "best" solution. Outputs for these problems compete against each other, and scores are scaled according to the best uploaded output. A team may submit multiple correct submissions to one input (only the latest submission will be taken into consideration).
- **Proportional** scoring: solutions to these problems will be compared against a chosen standard. The final score is calculated from the ratio of the evaluated score of the output to a selected constant. A team may submit multiple correct submissions to one input (only the latest submission will be taken into consideration).

Note that points are awarded per output file and not per problem. If your solution only works for some of the input files, you will still be awarded points for the correct output files. A single output file however is either correct or wrong - partially correct output files are not worth any points.

Additional information for time scoring:

Be quick about uploading the output files, because the scores awarded for every output file decrease with time. Uploading it just before the end of the contest is worth **70%** of the maximum points achievable for the test case. During the contest its value decreases linearly with time. However you

should also be careful with uploading solutions. Uploading an incorrect solution is worth **-5** points. This penalty is additive, if you upload more incorrect solutions, you will receive it multiple times. For some problems, we distinguish format errors (unparsable outputs) from incorrect outputs, and the former will not be penalised.

Please note that for time-scored problems there is no point in uploading another solution for an already solved testcase because you cannot achieve more points with it. Therefore the system will not register additional uploads for solved testcases for those tasks.

For some time-scored problems, after submitting an incorrect solution, there may be a certain short delay (a couple of minutes) until you can re-submit an updated solution. The delay is applied per team per task per input, and is reported on the submission web interface.

Additional information for competitive scoring:

In this case there will be no score penalty for uploading a solution later, so you are able to achieve the maximum amount of points by submitting in the very last minute - if you beat the other teams' solutions, that is. However, to avoid overloading our server, after submitting a correct solution, you may not re-submit an updated solution for a certain short delay (a couple of minutes). The delay is applied per team per task per input, and is reported on the submission web interface.

Scores for competitively scored problems are recalculated occasionally (every few minutes). Your points may decrease in time (when another team submits a better solution than yours).

Please be aware that only your last submission is considered - not your best one.

Good luck and have fun!

About the Submission site

The location of the submission site is:

<http://sub.ch24.org/sub/>

You will be able to log in to the submission site with your registered team name and password. After login you can access three main views:

Team Status

You can see your team's status here, with all your submissions and the points received for them.

Submit

This is where you can post your solution files. You can upload multiple output files for multiple problems with a single submit. The naming of the output files must strictly match the following format: X99.out - where X is the problem's character code followed by a number (1 or 2 digits) identifying the test case.

Scores

Here you can see the current standings of the contest. This will not be available in the last hour.

Contact

You should subscribe to the public mailing list at <http://lists.ch24.org> to receive announcements and to be able to send feedback. The address of the list is `ch24@ch24.org`.

During the contest we will be available on IRC on the `irc.ch24.org` server (using the default port, 6667), on the following channels:

- `#challenge24` for general discussion about the contest,
- `#info` for a full summary of announcements (read-only),
- `#p`, `#q` for problem specific questions.

Note: **all relevant questions/answers will be copied to `#info`**, which will be also available on the submission site.

Prologue

Welcome again to your childhood. This is your very first class, and you must take an exam. It will test your attention and patience.

Task Summary

Task	Score	Scoring type	Wrong answer penalty	Delay	Input format
P. Counter	1000	Time	-5 points	None	wav
Q. Lines	1000	Competitive	0 points	30s	png

- Wrong answer penalty: Penalty after each wrong output submitted.
- Delay: Time duration until no solution can be submitted for the same input.

For each task there is a dedicated irc channel for questions: #p, #q.

P. CodeCounter

You are the member of the CodeHunter team.

Please extract secret messages from these audio files.



Војни пољски Морзеов телеграф, Први светски рат
Army field Morse telegraph, WWI

[http://hu.wikipedia.org/wiki/Morzek%C3%B3d#mediaviewer/
File:Vojni_poljski_Morzeov_telegraf.JPG](http://hu.wikipedia.org/wiki/Morzek%C3%B3d#mediaviewer/File:Vojni_poljski_Morzeov_telegraf.JPG)

Input

Audio is given as 16 bit, mono wav files, sampled at 22050 Hz, with various transformations.

Output

The secret message.

Example input

Please refer to 0.wav.

Example output

abcdefghijklmnopqrstuvxyz0123456789?!. .

(not case sensitive)

Q. Lines

Please redraw the picture for us, using as few strokes as possible. Make sure to stay inside the lines!



http://en.wikipedia.org/wiki/Line_art
Paul_Gustave_Dore_(1832-1883)_-_Baron_von_Munchhausen_(1862)_-_009.jpg

Input

Black and white PNG files.

Output

Four integer numbers per line, separated by spaces:

x_1 y_1 x_2 y_2

X is a horizontal pixel coordinate, 0 the leftmost column, growing towards the right. Y is a vertical pixel coordinate, 0 the topmost row, growing towards the bottom. Coordinates may not fall outside the image.

Starting with a white canvas, each line will draw a black line from x_1 y_1 to x_2 y_2 , inclusive, using Bresenham's integer arithmetic line drawing algorithm (as described on Wikipedia). The output image must be identical to the input image.

Scoring

For each given input, submissions from all teams are evaluated. The score is based on the number of lines compared to the best submission (less is better):

$SCORE = 100 * (1 - \sqrt{1 - BEST / LINES})$