



# Rules of the Helvetic Coding Contest 2014

by Robert R. Enderlein

## 1 Introduction

1. The Helvetic Coding Contest wishes to provide a friendly environment where some of the best students in the Swiss educational system can compete at the highest level.

The Contest environment should allow first and foremost the dissemination of knowledge, the improvement of individuals' skills and an opportunity for social networking among the participants.

2. True to this objective, the HC2 organizers vow to provide a competitive and fair environment.

## 2 Conditions of Participation

### 2.1 Team Eligibility

3. There are two categories in which teams will be divided: 'students' and 'professionals'. The category 'students' will contain teams which consist only of students pursuing a master's degree or lower, currently enrolled in a Swiss educational institution (high school, HES, university, ETH or vocational school) or currently enrolled in a foreign educational institution but doing a bachelor/master thesis in Switzerland. Teams that contain at least one predoctoral/PhD student or one person that does not fulfill the above defined 'student' criteria will be part of the category 'professionals'. All members of all teams must be between the ages 14 and 28 (included).
4. Each team must be composed of at least 2 and at most 3 members.
5. The judge may ask contestants to prove their age and prove the data they entered in the registration form (such as affiliation and student status) is correct.
6. If there is not enough space to accept all teams and many teams are in the 'professionals' category, the judge will give priority to 'student' teams.

### 2.2 Special Eligibility

7. The Contest Judge may authorize a team to compete despite not fulfilling the eligibility criteria.
8. Such an authorization may only be delivered if it is justified by the Contest objectives enunciated in the introduction to the Contest rules (§ 1).

### 2.3 Team Registration

9. Teams willing to take part in the Contest must register on the Helvetic Coding Contest website (<http://hc2.ch>) no later than the date indicated on the website.
10. The contest judge may decide to close the registration early if too many people register.
11. The contest judge may put teams on a waiting list if too many people register.

12. Individuals without a team may also register. The judges will try to form balanced teams (to the best of their abilities) out of all individuals who are not yet in a team. The judge's decision on team composed in this manner is final.

## **2.4 Post-registration task**

13. Teams are required to solve a simple task/problem to prove that they know how to program.
14. This task will have to be solved at the latest 8 hours after the end of the registration deadline.

## **2.5 Payment**

15. A team ultimately confirms its participation by proceeding to the payment of its registration fees as indicated either by email or on the Contest website.
16. The deadline for the payment ("value date") is 2 days after the registration deadline.
17. The registration fee for members of the PolyProg student association is waived if they indicate their affiliation as "PolyProg".
18. Teams who have not paid or who are unable to prove payment of their participation fee in full will not be admitted to the Contest.
19. Teams not showing up during the team registration may be disqualified from the contest and forfeit their registration fee and t-shirt. The Contest Judge may make exceptions for contestants living far away from Lausanne, at his discretion.
20. Teams not showing up, sleeping, behaving rudely or interfering in any way during the sponsors' presentations will be disqualified and forfeit their registration fee and t-shirt.
21. Travel expenses and accomodation will not be reimbursed.

## **2.6 Early registration deadline**

22. A team is considered to have met the "early registration deadline" if (1) they register before Friday, February 28, 2014 at 23:59:59 CET, (2) they solve the post-registration task before Saturday, March 1st, 2014 at 07:59:59 CET, (3) their registration fees gets credited on the PolyProg account ("value date") on or before Wednesday, March 5, 2014.
23. Teams who miss at least one of the three deadlines above might have to yield their place to teams on the waiting list, at the Judge's discretion. The registration fee for teams disqualified in that manner will be payed back in full.

# **3 Conduct of the Contest**

## **3.1 Contest Judge**

24. The Contest Judge is the sole authority regarding Contest matters. He is allowed to nominate a deputy to act on his behalf should he be unable to preside over the Contest.

### 3.2 Dry Run

25. The Contest will be preceded by a dry run. The aim of the dry run is to get the contestants acquainted with the judging system.
26. The duration of the dry run is 30 minutes.
27. The judge may extend the duration of the dry run for up to 30 minutes at his discretion.
28. The ranking of the dry run will in no way influence the ranking of the contest.
29. All data on the teams' computers will be erased after the dry run.

### 3.3 Duration

30. The Contest duration is 4 hours and 30 minutes.
31. Under exceptional circumstances, including, but not limited to, contest-halting technical problems, the Contest Judge may extend the Contest duration for up to one hour.

### 3.4 Problems

32. The Contest features between four and eight algorithmic problems, which must be solved either in C, C++, Java or Scala. Each problem will be divided into three sub-problems.
33. Initially, only the problem statement for the first sub-problem will be visible.
34. When a team has solved the first sub-problem, the problem statement of the second sub-problem will be made available to the team on the web interface. A printout of the problem statement will then be delivered as soon as possible to the team's workstation.
35. Likewise, the third sub-problem will be made available once the second sub-problem has been solved.

### 3.5 Computing Environment

The Contest will take place on computers with the following specification.

36. Hardware:

- CPU: Intel Core i7-4770 CPU @ 3.4GHz
- RAM: 8GB
- Screen: 1920 x 1080
- Keyboard: Standard Swiss-French keyboard  
(keyboard layout can be changed in the desktop environment)
- Mouse: Standard 2 button mouse with scroll wheel.

37. Software:

- OS: Linux (distribution: Debian live) x86
- Desktop: GNOME
- Editors: gvim, emacs, gedit, geany, eclipse
- C compiler: gcc 4.8 or later
- C++ compiler: g++ 4.8 or later
- Java compiler: OpenJDK 6 or later
- Scala compiler: scalac 2.9.2 or later

38. Pencils or pens, and blank paper will be provided. Contestants may not bring their own.
39. Teams may bring their own USB keyboard and mouse, however these have to be approved by the Contest Judge. Especially noisy hardware, hardware containing a storage space, or hardware which would give the team an unfair advantage over their competitors will not be allowed.
40. For reasons of fairness and security, root access and internet access are disabled on the machines.
41. The Contest Judge is allowed to monitor the participants' computers to prevent activities which are contrary to the spirit or the rules of the contest.
42. Furthermore, to the best of their ability, the organizers will make regular backups of the teams' code to the Contest servers. The organizers shall not be held liable in the event of a backup failure.

### **3.6 Reference Material**

43. During the Contest, the following documentation will be at the participants' disposal:
  - C/C++ reference
  - Java Platform SE 6.0 API Docs
  - Documentation for the GNU Multiple Precision Arithmetic Library
  - Scala API documentation
44. The use of any other material, whether in digital, written, or printed form, is forbidden and will be considered an attempt to cheat. This also includes t-shirts containing too much text (such as the "Linux Cheat Shirt").

### **3.7 Printing Service**

45. The participants may request the organizers to print their source code in order to help with debugging.
46. The printing will be delivered to the team's workstation as soon as possible.
47. The organizers reserve the right to deny further prints to teams who have made excessive use of this service.

### **3.8 Dress Code**

48. Contestants who have received a T-shirt must wear that T-shirt during the whole day (until after the diploma ceremony).
49. Contestants who haven't received a T-shirt are strongly encouraged to wear a blue T-shirt, and are strongly discouraged from wearing a grey T-shirt.

### 3.9 Unauthorized Behaviors

50. The participating teams should in no way try to gain an unfair advantage over their competitors.
51. Food and drinks are not allowed in the computer labs or the auditorium. Teams might be disqualified and held liable for damages due to the presence of food and drinks in these areas.
52. During the contest, problem statements, printouts and draft paper are not to leave the immediate vicinity of your assigned computer. It is absolutely forbidden to take these out of the computer lab. It is also forbidden to write anything related to the contest on your hand, clothes, the walls, toilet doors, or any other place where they might be seen by other teams while outside the lab.
53. During the contest, it is forbidden to talk about the problems outside the computer labs.
54. Collusion or sharing of any information about the problems between two teams are grounds for immediate disqualification of both teams.
55. The Contest Judge is authorized to disqualify a team with or without warning should he notice deliberate attempts at hindering the Contest progress or fairness.
56. The disqualifying behaviors include, but are not limited to, trying to crash the Contest server, making excessive use of the printing service, trying to access the Judging System filesystem (fopen, fwrite, etc.) and forking to obtain a larger chunk of the Judging System computational resources or render them otherwise unavailable for the competing teams.
57. The use of forbidden functions (filesystem, multithreading) by a team will cause its immediate and irrevocable disqualification.

## 4 Scoring System

### 4.1 Scoring

58. To be considered a correct solution, each submission to a sub-problem must correctly solve all testcases of that sub-problem.
59. Teams may re-submit a solution to the same sub-problem.
60. Every sub-problem that was solved correctly after the  $n$ th attempt gives one point and  $(n-1)$  penalties.

### 4.2 Ranking

61. There will be two rankings, one for each category.
62. Teams are ranked by the total number of sub-problems solved (points), where more points is better.
63. If teams tie after applying the previous rule, they are ranked by total number of penalties, where less penalties is better.
64. If teams tie after applying the previous rule, they are ranked by the sum of the elapsed times at each point that they submitted correct solutions to a sub-problem (this is similar to how teams are ranked at the ACM ICPC contest), where less is better.

65. If teams tie after applying the previous rule, they are ranked by the submission time for their latest correct sub-problem, where earlier is better.
66. If teams tie after applying the previous rule, they are ranked by the submission time for their second latest sub-problem, etc.

### **4.3 Prizes**

67. There will be at least 15 prizes awarded during the diploma ceremony. The number of prizes awarded in each category is proportional to the number of participants in the category.
68. The best teams of each category will receive medals. In total, five teams will receive medals, and in each category, the number of teams receiving medals is proportional to the number of teams in the category. Each contestant winning a medal will also receive a prize.
69. There will be a raffle to determine the winners of the remaining prizes. The winning probability of a contestant will be proportional to the number of sub-problems his team solved. Contestants may not win several prizes (thus the medalist teams are excluded from the raffle). Contestants who don't show up at the diploma ceremony will forfeit their prize, and a new winner will be determined.
70. The sponsors may, at their discretion, award prizes to any contestants of their choosing.
71. The members of the first, second, and third teams will receive printed diplomas. All other contestants will be able to download their diploma a few days after the contest.

### **4.4 Judging system**

72. The Judging System is based on Domjudge 3.2.1.
73. The Judging System will run on a "High-CPU Medium Instance" in Amazon's Elastic Cloud Computing (EC2) web service.
74. You will only be allowed to use a limited amount of the total memory, as deemed appropriate by the Contest Judge and the problem authors.

### **4.5 Judging Feedback**

75. The judging system provides a number of indicators regarding the success or failure of test cases.
76. The following messages are used as status indicators:
  - Judging
  - Correct
  - Compiler-Error
  - Timelimit
  - Run-Error
  - No-output
  - Wrong-answer
  - Presentation-Error
  - Too-late
77. The status of a submission will be displayed on the web interface as soon as judging finished. The status will not be shown to other teams.

78. The team who submitted a solution that received a status of “compiler error” will be able to see the error message of the compiler on the judging system.
79. The Contest Judge is authorized to modify the reported status should he consider that another status is more meaningful with respect to the team submission.

#### **4.6 Ranking**

80. During the first three and a half hours of the contest, the current ranking of the teams (including which problems each team attempted and solved) will be made available to all teams on the web interface.
81. During the last hour of the Contest, the ranking display will be frozen and the winners will only be announced at the HC2 Diploma Ceremony.
82. Once the winners are announced at the HC2 Diploma Ceremony, the Contest Judge decisions are final.

### **5 Insurance and liability**

83. The organizers, staff and sponsors of HC2, as well as all the people involved at EPFL don't take any responsibility for accidents, losses, or theft occurring before, during, or after the contest, including items left in the wardrobe. It is the participants own responsibility to arrange for their insurance cover.

### **6 Photography/Films**

84. Contestants consent to being photographed and filmed by the organizers, staff, or persons authorized by the organizers. Furthermore they authorize the publication of the resulting pictures and films on any media as seen appropriate by the organizers, including but not limited to: (1) On websites in the epfl.ch, ethz.ch, and hc2.ch domains. (2) In the Flash, Flash Informatique and Visionen newspapers/magazines. (3) In a swiss newspaper. (4) On a swiss television program.
85. Third parties that are not competing in the Contest nor involved in its organization are forbidden to shoot still photography, record sound, and shoot video on the premises of the Contest unless explicitly authorized to do so by the Contest Judge.

### **7 Copyright of submitted code**

86. By submitting their code to the contest judging system, contestants grant the PolyProg association unlimited but non-exclusive rights to use and publish their source code.

### **8 Updates to this document**

87. The contest rules may be updated until 48 hours before the start of the contest.
88. All teams who have registered up to 60 minutes after the publication of a new revision of the contest rules will be notified by e-mail by the contest judge.

89. Teams may withdraw their registration if they do not accept a new revision of the contest rules, provided that they announce their withdrawal to the contest judge no more than 47 hours after the e-mail announcing that change was sent out, and provided that they offer a reasonable explanation as to why the changes negatively affect them. The participation fees of a team who withdraws in this manner will be paid back in full.

## **9 Final Provisions**

90. All teams participating in the Contest are required to accept the Contest rules.