

The Standard Bank University Challenge 2012

Competition rules

Rules for the Standard Bank University Programming Challenge 2012 are as follows.

The competition is sponsored by Standard Bank.

The Competition Chief Judge is solely responsible for ruling on any unforeseen situations and all such decisions are final.

1. Competition eligibility

- 1.1. To be eligible for the competition, students must
 - currently attend a university in South Africa,
 - be South African citizens or permanent residents,
 - be full-time undergraduates in any discipline, or
 - be full-time or part-time honours students in any discipline.
- 1.2 Up to four people can be entered for each team, all of whom may attend the heat or the final. In all teams one member must be named as Team Manager. All four members may take part in programming tasks. Each team must include at least one member of the opposite sex and at least one team member must be African, Indian or Coloured.
- 1.3 For teams that successfully reach the final, a maximum of two team members may be replaced by substitutes following the heats, as long as the conditions set out in (1.1) and (1.2) are met.
- 1.4 Teams from Standard Bank may also participate but are not eligible for any of the prizes.

2. Conduct of the competition at the HEATS

- 2.1 The heats will be held on Saturday 10th March 2012 at the team's home university or nearby facility. The heats will last for 4 hours starting at 10:00 a.m.
- 2.2 Each team should be given access to one PC and one printer. The following programming languages may be used (participants can use any one or any combination of these)
 - a) Java 2 Standard Edition
 - b) C++
 - c) Python

Solutions will be compiled and/or executed using Sun Java SE 1.6, GCC 4.4 and Python 2.6. If these versions or tools are changed, competitors will be notified before the start of the competition.

- 2.3 Only solution source files submitted via the contest submission system can be accepted or considered.
- 2.4 The Competition Managers cannot accept responsibility for any solutions that are not received during the heats, whether due to transmission delays or otherwise. Proof of transmission is not proof of receipt.
- 2.5 Up to five problems may be posed. There may be problems to which access will only be given once another problem has been solved.
- 2.6 As far as practicable, the problems will avoid dependence on detailed knowledge of a particular application area. The problems will not necessarily be of equal difficulty.
- 2.7 Competitors may consult any source materials intended for human use, including books, manuals, program listings and non-programmable calculators. Competitors must not load machine-readable versions of software prior to the competition, nor may they bring their own computers (including programmable calculators and personal digital assistants), mobile phones or computer peripherals into the competition area. In addition, removable machine-readable media (e.g. memory pens, CDs) must not be brought into or taken out of the competition. All source material must be declared. In the event of any uncertainty as to admissibility, the Chief Judge's decision is final. Infringement of this rule may lead to disqualification.
- 2.8 Any team which believes that a question is ambiguous or unclear may request clarification from the judges using the competition software. The judge's responses can subsequently be viewed using the competition software.
- 2.9 The competition rules may require problem solutions to conform to a specified interface or to produce output in a particular format. They will then be tested in a judged run against hidden test data compiled by the judges. By default, such a judged run is deemed successful by the judges if it processes the hidden test data correctly within the time and memory constraints that will be specified in the contest materials.
- 2.10 The scores of the other teams will be available on an electronic scoreboard. This scoreboard will not be updated during the last hour of the competition.
- 2.11 Problem solutions must not attempt to spawn new processes or threads, open files or sockets or otherwise attempt to interfere with the evaluation process. Teams submitting such solutions may be disqualified.

- 2.12 Teams will randomly be assigned to particular rooms, computing facilities, etc. While the judges will endeavour to minimise the effect of hardware failures, no responsibility can be accepted if they occur. Under no circumstances shall teams attempt to alter or interfere with the computing facilities provided without the prior permission of one of the competition judges.
- 2.13 Only the top-scoring team at each university is eligible to attend the final, and teams that do not correctly solve any of the questions are not eligible. The top nine eligible teams will be invited to the final. If there are fewer than nine eligible teams, the competition organisers may invite addition teams based on performance. This decision is entirely at the discretion of the competition organisers and no debate will be entered into in this regard
- 2.14 The decisions of the Competition Chief Judge are final and no correspondence will be entered into.

3. Conduct of the competition at the FINAL

- 3.1 The competition will be held on Wednesday 16 May 2012 in Gauteng.
- 3.2 Each team will be given access to one PC and access to a printer. The following programming languages may be used (participants may use any one or any combination of these)
- a) Java 2 Standard Edition
 - b) C++
 - c) Python

Solutions will be compiled and/or executed using Sun Java SE 1.6, GCC 4.4 and Python 2.6. If those versions or tools are changed, competitors will be notified before the start of the competition.

- 3.3 Competitors will be informed of the results on the day of the competition. Again, the decision of the Competition Chief Judge is final.
- 3.4 Up to seven problems may be posed. There may be problems to which access will only be given once another problem has been solved. As far as practicable, the problems will avoid dependence on detailed knowledge of a particular application area. The problems will not necessarily be of equal difficulty.
- 3.5 Competitors may consult any source materials intended for human use, including books, manuals, program listings and non-programmable calculators. Competitors must not load machine-readable versions of software prior to the competition, nor may they bring their own computers (including programmable calculators and personal digital assistants), mobile phones or computer peripherals into the competition area. In

addition, removable machine-readable media (e.g. memory pens, CDs) must not be brought into or taken out of the competition. All source material must be declared. In the event of any uncertainty as to admissibility, the Chief Judge's decision is final. Infringement of this rule may lead to disqualification.

- 3.6 All problem solutions submitted for judging must be expressed in Java 2 Standard Edition, Python or C++ the designated languages of the competition, using the designated hardware with the designated operating system, compiler, interpreter and other software.
- 3.7 Teams may not accept help or advice on competition problems or rules from anyone except competition judges who are authorised to give such advice. The judges will also clarify problem ambiguities and may advise on system-related queries, explain error messages, etc.
- 3.8 The judges will not invite questions about problems. A team may submit a written assertion of ambiguity or error in a problem statement using procedures defined by the judges. If the judges agree that there is an ambiguity or error in the problem statement then they will issue a clarification to all teams.
- 3.9 The competition rules may require problem solutions to conform to a specified interface or to produce output in a particular format. They will then be tested in a judged run against hidden test data compiled by the judges. By default, such a judged run is deemed successful by the judges if it processes the hidden test data correctly within the time and memory constraints that will be specified in the contest materials.
- 3.10 Problem solutions must not attempt to spawn new processes or threads, open files or sockets, or otherwise attempt to interfere with the evaluation process. Teams submitting such solutions may be disqualified.
- 3.11 The solutions to some questions may be judged in "interactive mode". To be deemed correct, such solutions must conform to the specified interface and/or output format without causing exceptions or exceeding the time or memory constraints specified in the contest materials. Once a team has submitted a correct solution to an interactive question, they may submit further solutions to the same question without penalty. If more than one team submits a correct solution to such a question, the correct solutions will be ranked in a manner specified by the question. In general, this ranking will reflect the efficiency and/or fitness for purpose of the solutions. If a team has submitted more than one correct solution to the question, the last submitted solution will be used for the final ranking. At the discretion of the Chief Judge, the current ranking of solutions to an interactive question may be communicated to the competitors during the competition – otherwise, the judges' response to the submission of a solution to an interactive question will be in the same format as a response to a solution to any other question.

- 3.12 If a judged run is not deemed successful, then a statement to that effect will be returned by the judges. Any compiler error messages (e.g. identifying the place where an error was detected) will also be returned if they do not compromise the integrity of the judges' hidden test data. An unsuccessful judged run will be labelled with a phrase to indicate the reason for rejection, including for instance: syntax error, full-time error, time limit exceeded or incorrect output.

The judges will not intentionally attempt to mislead competitors about the nature of their errors; neither will they guarantee to identify the true error in the program. Normally, the first symptom of error will be noted and described by the most appropriate phrase.

- 3.13 Although the length of the competition is expected to be six hours, the judges have the authority to shorten or extend the competition in the event of unforeseen difficulties. If the duration of the competition is altered, every attempt will be made to notify competitors as soon as possible and to assure uniform impact on all teams.

- 3.14 Teams will randomly be assigned to particular rooms, computing facilities, etc. While the judges will endeavour to minimise the effect of hardware failures, no responsibility can be accepted if they occur. Under no circumstances shall teams attempt to alter or interfere with the computing facilities provided without the prior permission of one of the competition judges.

4. Scoring of the competition (general)

- 4.1 Sample data and sample output will be given with each question. This is provided to assist in clarifying the format required for input and output by the question, and should therefore be read as part of the question. It should be clearly understood that the only thing implied by the sample data is that a correct program, given the sample data, should produce the sample output. In particular it does not imply that the Judges will use that data to test the program, or that the sample data will necessarily check for any or all special cases that the question may require. Competitors can assume that the Judges' data will be in the correct format unless the question explicitly asks competitors to check the format.
- 4.2 The judges will be solely responsible for determining the correctness of submitted problem solutions and deciding the winners of the competition. They are empowered to adjust for and adjudicate on any unforeseen events and conditions. The decisions of the Chief Judge are final.

5. Scoring of the competition at the HEATS

- 5.1 The positions are based in the first instance on the number of successful judged runs. In the case of equal numbers of successful judged runs

then the order is determined by the least amount of total elapsed time for all the successful runs.

- 5.2 A time penalty of twenty minutes will be added for every unsuccessful judged run on problems that are eventually completed successfully, with the exception of compilation errors for which there is no penalty.

6. Scoring of the competition at the FINAL

- 6.1 The positions are based in the first instance on the number of successful judged runs. In the case of equal numbers of successful judged runs then the order is determined by the least amount of total elapsed time for all the successful runs.

- 6.2 A time penalty of twenty minutes will be added for every unsuccessful judged run with the exception of compilation errors for which there is no penalty. Once a team has submitted a successful solution to an interactive question, subsequent unsuccessful submissions to the same question will not attract this penalty.

- 6.3 Each team which makes at least one successful submission to an interactive question is credited with a successful judged run for that question. At the discretion of the Chief Judge, these solutions may attract a score bonus. Typically, the highest-ranking solution will be credited with an additional successful judged run (i.e. will be given double weight in the final scoring of the competition). If there is a second-ranking solution, it will instead be credited with 120 minutes (i.e. 120 minutes will be deducted from the team's total elapsed time for scoring purposes) and the third ranked solution (if any) will be credited with 60 minutes. Any variation of this scoring for a particular interactive question will be communicated to the teams before the start of the competition.

- 6.4 Among teams solving the same number of problems during the competition, the number of minutes elapsed, including any time penalties, until each successful solution, will be totalled and these teams will be placed in order by the rule that the shorter the time taken, after any bonuses are taken into account, the higher the position.

- 6.5 The Judges reserve the right to add additional problems during the progress of the final. Should this occur, the scoring of such problems will be declared at the time.

- 6.6 If rules 6.1 to 6.4 still produce a tie, the tie will be broken by considering the time of the last correct submission from each team (teams with an earlier time rank higher than those with a later time). Only a team's first correct submission on any problem is considered in this rule (i.e. teams are not penalised for making further correct submissions on an interactive task). If a tie still remains, this rule will be repeated on successively earlier correct solutions until the tie is resolved.

7. Prizes

Prizes will be presented by the sponsors Standard Bank, to the teams which come in 1st, 2nd and 3rd place.

8. General

- 8.1 The Competition Managers reserve the right to cancel the competition at any time, should it deem such action to be necessary.
- 8.2 The competition is not open to any person directly or indirectly involved in the management of this competition.
- 8.3 All entrants will be deemed to have accepted these rules and to agree to be bound by them when entering this competition.
- 8.4 The Competition Managers shall not pass on the personal details of any competitors to any third party without express consent except for the purposes of running the competition.