

Rules of the challenge ROADEF-EURO-SNCF (2013-)2014

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April 25, 2014

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1 Main rules, goal and spirit of the challenge

1. The ROADEF-EURO-SNCF 2014 challenge is an optimization contest that offers prizes to the most successful teams.
2. The problem, subject, instances and checker are proposed by the organizers.
3. Participants compete to propose the best algorithmic solution to solve the problem.
4. Participants are also welcome to provide feedback to the organizers concerning the subject, instances, checker and rules of the challenge. Such feedback might improve the 2014 edition, as well as future ones.
5. It is the spirit of its rules that is important, not the letter. Please participate in the spirit of the rules, and ask questions on the forum if you are unsure or if you want to share some information.

2 Who can participate ?

1. A team can be composed of any number of persons.
2. One person cannot be member of more than one team.
3. Each team can submit only one program.
4. A team cannot compete for the junior prize if one or more of its members has defended a Ph.D. on December 31st, 2013.
5. Persons employed by SNCF cannot participate.
6. Members of laboratories having signed contracts with SNCF before February 27th, 2014, to work on topics directly related to the subject of the challenge cannot participate.
7. The organizers cannot participate, but members of their respective laboratories can participate. In such cases, the organizers do not share with them any information related to the challenge unless it has been previously communicated to all participants.

3 Questions, communications and collaborations

1. The organizers communicate information on the forum and web-page of the challenge.
2. Participants must ask questions on the forum. Questions asked by email might be ignored by the organizers.
3. Organizers answer to the questions on the forum.
4. Any forum participant can read all questions and answers.
5. When necessary, organizers propose to the authors of the questions or to all participants, to send them details (in particular solution files), in order to provide an appropriate answer to the question and to improve the challenge. Such information provided by the participants to the organizers remains secret to all other participants.

4 Intellectual property

1. Participants have intellectual property on their computer programs developed during the challenge. SNCF and any third party may use informations provided by the participants through technical reports, scientific papers and oral presentations, but cannot use a computer program without the agreement of the team who wrote this program.
2. Participants to the challenge cannot claim to have a partnership or a contract with SNCF, even if they win the challenge. They can only claim to be participants (respectively qualified / winner) if it is the case.
3. SNCF may (but has taken no engagement to) sign contracts with some participants after the challenge. Any such contract would be independent from the challenge.

5 Phases, dates, ranking methods and prizes.

There will be “four challenging phases” and “three result and announcement phases” in this challenge 2014. All prizes will be paid when the challenge is over. All announced prizes are part of a fixed prize pool, prizes will hence be shared in cases of tie.

- Kick-off and debugging phase : September - October 2013.
 - Release of the rules, the checker and instances A .
- Sprint announcement : November 4th 2013.
- The first sprint (optional) - deadline: November 15th 2013.
 - Each team can submit a solution file for each $A(1$ to $12)$ -instance.
- First sprint results and second sprint announcement: November 25th 2013.
 - Result of the first sprint. Best solutions values are made available.
- The second sprint (optional) - deadline: December 11th 2013.
 - Each team can submit a solution file for any number of instances from set $A(1$ to $12)$.
- Second sprint results and qualification announcement: December 18th 2013.
 - Result of the second sprint. Best solutions values are made available.
 - Qualified teams from the sprints, and prize winners are announced.
- The qualification - deadline: January 15th 2014.
 - Each team submits a computer program, solution files, computational results table and a short (2 pages) description of the method, including the characteristics of the computer used.
 - The teams will be ranked based on the solution files output by their program, ran by the organizers on instances A .
- Qualification results and start of final phase: February 27th 2014.
 - The target of the committee is to qualify between 10 and 25 teams. One major goal of the committee is to exhibit a qualitative gap between the worst qualified teams and the best non qualified teams. Moreover, the committee reserves the right to qualify any team whose solver exhibits good behaviour on some instances, even if it fails to find good/feasible solutions on some other instances.
 - The winner of the qualification (1000 Euros), is decided by the following ranking function: lexicographic increasing values of the sum of the vector values over all instances. (see sprint results on the web page, S18 having all the records on A1-12). Infeasible solutions give the score $(1.2 * |\mathcal{D}|, 0, 0)$: “120 percent of the departure are cancelled”.
 - Slight modifications in the subject will be made.
 - Instances B will be released to participants.

- **Final phase - deadline: June 15th 2014.**
 - Qualified teams submit the final version of their program, a table of computational results on instances B , an extended abstract (5 pages max.) describing the method, including the characteristics of the machine used for their results.
- **The scientific prize - deadline: June 22th 2014.**
 - Qualified teams who wish to compete for the scientific prize submit a technical report in .pdf format, describing their results. For example, this .pdf may describe an analysis of the subject, numerical results including dual bounds, feasible solution without computational restrictions, sub-problem analysis, computer implementations, etc.
 - Solution files (that can be evaluated by the official checker) improving slightly on the performance reported on June 1st, should be submitted if the technical report puts focus on them.
 - Other documents/files can be submitted, but might not be considered by the committee members if they don't find them easy to open and analyse. Moreover, their relevance should be explained in the technical report.
 - Notice that the documents provided on January 15th and June 1st will not be made available to the committee. Any relevant information should hence be included in the technical report.
- **Final results: July 17th 2014.**
 - Qualified teams are ranked according to the solution files output by their program, ran by the organizers, using the following ranking function. The global score of team T is the sum of its scores over the instances $B \cup X$. For each instance I , if the program of T is still running at the time limit or if the output solution is infeasible, then the score of T on I is equal to the score of the empty solution file. Notice in particular that the empty solution file is feasible for each instance in $B \cup X$.
 - Instance set X will be released.
 - The team ranked first will be granted 7000 Euros.
 - Among the junior teams, the first three will be granted respectively 4000, 2000 and 1000 Euros.
 - Based on the documents provided on June 15th and the oral presentations made at the IFORS 2014 conference, the committee will choose the winner team(s) for the scientific prize, and share 2000 Euros among them.

6 Using external solvers

1. The following solvers can be used (your code must be able to run on these specific versions).
 - CPLEX 12.5
 - XPRESS 7.3
 - Gurobi 5.6
 - Local Solver 3.1
2. Requests for other solvers (via the forum) will be examined by the committee.
3. The challenge does not provide licenses, which must be acquired by the participants for their own tests.
4. The challenge computers have a licence for each solver cited above for its own tests.

7 Subject, instances and checker: discussions and updates

1. Participants are welcome to report and discuss on the forum, any doubt/error/question raised on the subject, the instances and the checker.
2. The organizers try to answer to the participants as fast and accurately as possible.
3. The organizers try to avoid making changes in the subject, the instances and the checker, unless they find it necessary for the relevance of the contest.
4. The organizers will favour two dates for updating the subject, instances and checker: November 30th 2013 and February 27th 2014. Slight modifications of the subject are likely to occur on the second date.
5. In order to help the participants managing their project, the organizers try to communicate immediately changes that are already decided but that will become effective only on announcement dates.

8 Meta-rules

1. The organisers reserve the right to change the rules, the subject, the instances and the checker at any time. Any change will be communicated to all participants through the forum.
2. The organisers reserve the right to disqualify any participant or team from the competition at any time if the participant is considered to have worked outside the spirit of the competition rules. The organisers' decision is final in any matter.