
Data Structures and Algorithms + Algorithmics

Game Q1 2023-2024 – Crematoria

The game has started!

This semester you will participate in the game *Crematoria*, in which matches consist of four players. In this document you can find all the necessary information regarding the rules of this competition, which has three phases:

1. **QUALIFICATION PHASE.** Each student has to program a player which is able to defeat the Dummy player (a player that has been prepared by the professors and which follows a relatively simple strategy). When a new submission is sent to the judge, the following steps are carried out:
 - a) The code of the new player is compiled. If it does not compile, the submission is rejected.
 - b) A match with four copies of the submitted player is played. If any of these programs aborts or takes too long to respond, the submission is rejected.
 - c) Four matches are played, in each of which the submitted player plays against three Dummies. The submission will be rejected if the player does not win all four matches.

If these three steps are overcome, the player is accepted and the student is qualified.

The deadline for getting a player accepted is **Sunday, December 10th at 21:00**. All students who have qualified will get at least 5 out of the 10 total points in the game; those who have not qualified, will be expelled from the competition and their grade in the game will be 0.

2. **PLAY-OFF PHASE.** Programs of those students who have passed the previous phase will fight against each other for several days at the rate of some rounds per day. At the end of each round the student with the worst results will be eliminated. The later a student is eliminated, the higher his/her grade will be, proportionally. The last 11 survivors of EDA, who will all get the maximum grade, will compete in the **Grand Final** together with the last 5 survivors of Algorithmics from the Degree in Mathematics, where a parallel competition is run. The Grand Final will be held on **Thursday, December 21st at 16:30**.

Rounds work as follows. In each round all students are distributed in groups of 4 randomly, adding Dummy players if necessary for padding up to a multiple of 4. In each match, any student who gets better score than two of their three rivals in the match passes. The process is repeated (distribute in groups of 4, etc.) until only 4 or less students remain. Then matches are played among these students (adding, if necessary, Dummy players) until one of them is left behind by the rivals, excluding Dummies. The author of this last losing program is eliminated.

Once the deadline of the qualification phase is over, students will have the chance to choose, from among those players that have been submitted and passed the Dummy, their representative in the competition. This election will be possible until **Monday, December 11th at 14:00**. Students cannot assume anything on the player which, among those submitted that beat the Dummy player, will be their representative by default in the competition. Students will have to explicitly choose their representative before the competition begins. On the other hand, throughout the competition (while not eliminated and until the Grand Final is reached, if that is the case), students can submit new players and change their representative. Each new player must have a different name; one can, for example, add a suffix that indicates the version number.

During the play-off phase, if the Dummy player turns out to be too weak in comparison with the surviving players, the organizers might change the Dummy player for a stronger one.

3. **GRAND FINAL.** The Grand Final will be composed of 4 semifinals and one final. In each of these rounds a certain number of matches will be played. In each such match, the participants will receive 4, 3, 2 or 1 points, depending on whether they are first, second, third or last in the match. The winner of the round will be the player that has accumulated the largest number of points during those matches. This is the way we will determine which four players make it to the final and who is the winner of the final.

To submit your players and qualify, go to the competition *Crematoria FIB/FME Q1 2023-24* in the *Competitions* section in Jutge.org. There you will also find the materials that you need to program your player and view matches locally. You can watch how the play-off develops in real time as well.

Professors reserve the right to make any changes on the game that are deemed necessary during the development of the competition. In the unfortunate case in which an inconsistency is detected between the specification in the provided documentation and the code of the game, the latter will prevail (and the inconsistency will be fixed as soon as possible in one sense or the other).

The practical work is **individual**. Take into account that Jutge.org includes a plagiarism detection system (which incorporates submissions from previous years) and that the UPC academic standards will be applied for those students who perform fraudulent actions. In particular, and according to FIB/FME regulations, the student that committed the fraudulent act **as well as anyone that allowed it** will have a grade of **zero of the subject**, notwithstanding other disciplinary actions that may be taken.

Good luck!

IMPORTANT DATES:

- End of qualification phase: Sunday, December 10th at 21:00.
- Deadline for choosing the representative for the play-offs: Monday, December 11th at 14:00.
- Play-off start: starting Monday, December 11th at 15:00.
- Grand Final: Thursday, December 21st at 16:30.