

Samurai Coding 2015-16 Preliminary Round Rules

December 25th, 2015
IPJS Programming Contest Committee

This document states the rules of the first and second preliminary round tournaments of Samurai Coding 2015-16, including game setting, match arrangement, and scoring.

1. Outline of Preliminary Round Tournament

A preliminary round tournament consists of a number of sections. In one section, all the participating AI's are involved in a single game, and thus all the AI plays the same number of games in the tournament, which is equal to the number of sections. In each section, AI's are ranked by the total points obtained up to the previous section, and the topmost six AI's plays one game, then the seventh through twelfth AI's play another, and so on. If the number of participating AI's is not a multiple of six, the organizer provides its own AI's to make it a multiple of six.

The number of sections will be decided considering the number of participating AI's, but is expected to be around one hundred.

2. Game Setting

Setting of the games in the preliminary rounds will be as follows.

- Battlefield: The battle field has the size of 15 times 15 squares.
- Home positions: Home positions of samurai with spear, swords, and battleax for one army are (0, 5), (0, 14), and (9, 14), respectively, while for the other army, they are (14, 9), (14, 0), and (5, 0).
- The total number of turns: The total number of turns is 192.
- Time limits: The AI's have to respond within 5 seconds to the game information sent at the start of the game, and they have to make responses within 100 milliseconds in each of the turns.
- Cure period: Injured Samurai requires 20 turns to recover and make actions again.

3. Scores and Ranking

The score consists of winning points and occupation points. Winning points of 300 are given to the member AI's of the winning army, and no winning points are given to the members of the loser army. One occupation point is given to the final occupier of each battlefield squares at the end of the game. As the home position of a samurai is always occupied by the samurai, the highest score achievable in one game is 550, which is 300 winning points plus occupation points of $15 \times 15 - 5 = 220$, while the lowest is one point.

4. Match Arrangement

In each section, AI's are ranked by the total points obtained up to the previous section, and the topmost six AI's plays one game, then the seventh through twelfth AI's play another, and so on. When two or more AI's have earned the same score, their ranks used for match arrangement are decided by drawing lots based on pseudorandom numbers. As the very first section does not have any preceding sections, match arrangement will be random.

5. Army Composition and Which Plays First

The six AI's that play single game are partitioned into two armies. The total of numbers of times the same AI pairs played in the same army are compared among ten possible ways of partitioning, and one with the least is chosen. If there are two or more partitioning ways, one among them is chosen by drawing lots based on pseudorandom numbers.

Six different weapon assignments for three samurai in an army are possible. The numbers of times constituent AI

have played with the same weapon are summed up for each of the possible assignments, and one with the least such sum is chosen. If there are two or more such assignments, one is chosen by drawing lots based on pseudorandom numbers.

For two armies, the total number of times constituent AI's participated in the armies playing first in the games of preceding sections are compared, and one with the smaller such number plays first. If two armies have the same such number, the play order is decided by drawing lots based on pseudorandom numbers.

6. Deciding Finalists

The ranks in the preliminary rounds are decided by the total score obtained up to the final section. In each of the first and second preliminary rounds, six top-ranked AI's will precede to the final round. Three more AI's will be selected taking diversity and geographical distribution in consideration.