

# Samurai Coding 2015-16 Final Round Rules

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IPJS Programming Contest Committee

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

## 1. Outline of the Final Round Tournament

The final round tournament consists of three group leagues and a final league. The 18 AIs that advance to the final round are divided into three groups of 6 AIs each, in which many games are played. The top 2 AIs of each of the group leagues will advance to the final league. The final ranking of Samurai Coding 2015-16 will be decided with the results of the final league. In each of the group leagues and the final league, 120 games are played.

## 2. Forming the Group Leagues

AIs advancing to the final round are grouped according to their scores in the preliminary rounds. AIs advancing to the final round from the first preliminary round are numbered 11, 12, 13, ..., 19, and those from the second preliminary round are numbered 21, 22, 23, ..., 29, in descending order of their scores in the respective preliminary round. The teams for the three group leagues are then formed as follows.

- A: 11, 16, 17, 23, 24, 29
- B: 12, 15, 18, 22, 25, 28
- C: 13, 14, 19, 21, 26, 27

When two or more AIs have exactly the same score in a preliminary round, their order is decided randomly using pseudorandom numbers.

## 3. Game Setting

Setting of the games in the final round 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 AIs 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 return to their actions.

## 4. Scores and Ranking

The score consists of winning points and occupation points. Winning points of 300 are given to the member AIs 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.

## 5. Army Composition, Which Plays First, and Weapon Assignments

The six AI's that play a single game are partitioned into two armies. There are ten possible ways of partitioning 6 AI's into two armies of three samurai, and taking which army plays first, there are twenty different settings. Six different weapon assignments for three samurai in an army are possible. All the combinations of these, 120 games in total, will be played in a league. Note, however, that not all the combinations of different weapon assignments of two armies are exhaustively played.

## 6. Advancement to the Final League

The ranks in the group leagues are decided by the total score obtained up to the final game, and top two AI's of each of the three group leagues will advance to the final league. If three or more AI's finish first or two or more AI's finish second with the exact same score, an extra game will be played and the AI's to advance to the final league are decided based on cores of the extra game. If the extra game results in a tie score for the teams in question, additional extra games are played for those teams until the two advancing teams are decided. Army composition and weapon assignments are randomly decided using pseudorandom numbers.

## 7. Final Ranking

The final ranking of the contest is decided on the total score of the final league. If two or more AI's score exactly the same, an extra game will be played to decide the ranking of the relevant AI's. Additional extra games are played if there is a tie until a unique ranking can be determined. Army composition and weapon assignments are randomly decided using pseudorandom numbers.