

Go Tournament Rules of the Computer Olympiad

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1 Informal outline

- Chinese rules:
 - area scoring,
 - suicide is illegal,
 - basic ko + long cycle rule (no superko!).
- The komi¹ is set to 6.5.
- 19x19 Go:
 - Each program should complete its moves for 19×19 Go in 60 minutes.
 - In case of a dispute where each program has played at least 125 moves in 60 minutes the result is decided by the tournament director. If only one program has not played at least 125 moves in 60 minutes that program loses immediately.
- 9x9 Go:
 - Each program should complete its moves for 9×9 Go in 30 minutes.
 - In case of a dispute where each program has played at least 30 moves in 30 minutes the result is decided by the tournament director. If only one program has not played at least 30 moves in 30 minutes that program loses immediately.

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¹This is for full-counting; see also footnote 3. If the majority of the participants agree this komi may be increased to 7.5.

2 Notice

In principle the Computer Olympiad Go rules attempt to conform to the Chinese rules described in [1], which are based on the 1988 version of the official rules of the Chinese Weiqi Association. Unfortunately, these rules are slightly ambiguous and rely on some rather imprecise rules for the referee. Especially the rules for dealing with reappearance of the same board position (long cycles) are imprecise and defined in a rather ad-hoc fashion (in rare cases they give the referee the option to declare a draw or a replay). As a consequence there has been some uncertainty among the participants on how the Chinese rules will be interpreted at the Computer Olympiad.

This document provides an alternative rules text which has generalised rules for dealing with long cycle repetition, matching all the (ad hoc) examples of the Chinese rules presented in [1]. Because the tournament will be played under time constraints, and because two deterministic programs may play the exact same game over and over again, we will only describe the conditions for declaring a draw, ignoring the option to declare a replay.

To accommodate for the fact that our rules are targeted at computer programs, unlike the normal Chinese rules that are targeted at human players, we use a somewhat different and more mathematical wording. We have added some additional procedures that do not change the nature of the rules, but should make life easier for the operators and the tournament director. Further, the text is condensed by omitting irrelevant topics corresponding to sections of the Chinese rules that are covered by the general Olympiad rules, common sense, or simply have no use in computer-computer play.

3 Computer Olympiad Go Rules

Important: *Although we attempt to be as precise as possible, we cannot rule out that disputes arise due to unforeseen events that are not (adequately) covered by this rules text, or by the general Olympiad rules. When this happens all participants are expected to behave in a sportsmanlike manner and accept the decision by the tournament director (TD), who may use any means at his discretion to come to a fair decision.*

3.1 The board

The game of Go is played by two programs, Black and White, on a rectangular grid of horizontal and vertical lines (9×9 or 19×19). Each intersection of the grid is coloured black if it contains a black stone, white if it contains a white stone, or empty if it contains no stone. Initially the board is empty.

3.2 The move

One program uses black stones, the other white stones. The program with the black stones starts the game. The programs move alternately. A *move* is either a *play* of a stone on an empty intersection, or a *pass*.

Instead of moving, at any point during the game a program, or its operator, may resign, in which case the game ends as a win for the opponent.

3.3 Connectivity and liberties

Two intersections are adjacent if they have a line but no intersection between them. Two adjacent intersections are connected if they have the same colour. Two non-adjacent intersections are connected if there is a path along lines of adjacent intersections of their colour between them. For an intersection, the intersection and all connected intersections of the same colour form a block. The adjacent empty intersections of a block are called liberties.

3.4 Capture

A block is captured when the opponent plays a (legal) move on the block's last liberty. Captured blocks are removed from the grid; the intersections are coloured empty.

3.5 Illegal moves

Suicide: A play that does not capture any block and leaves its own block without a liberty is illegal.

Ko: A play may not capture a single stone if this stone was played to capture a single stone in the last preceding play.²

3.6 Long cycle rule

A board position is defined by the colouring of the grid's intersections directly after play and any consequent removals.

If a play recreates a previous board position then exceptionally and immediately the game ends and is scored, based on an analysis of all moves played since the moment just after the first occurrence until the moment just after the last occurrence, as follows

1. If between the two occurrences the difference in number of captured black and white stones is not zero, then the program that captured the most stones of the opposing colour wins the game.
2. If between the two occurrences the difference in number of captured black and white stones is zero, then the game ends as a draw.

²Notice that 2 passes do not lift the ko ban; ko-recapture requires an intervening play.

3.7 Agreement

1. Alternate moving stops by 2 consecutive passes.
2. Whenever alternate moving stops, each program provides information about all, black or white, stones that it considers removable. If a program does not provide this information it may be provided manually by the operator. If neither the program nor the operator provides this information it is assumed that the program believes that no stones shall be removed.
3. If the programs agree in 3.7.2 which stones, if any, shall be removed, then these are removed and then the game is scored due to 3.8.
4. If the programs disagree in 3.7.2 which stones shall be removed they are encouraged to resume alternate moving, at most 3 times, with the program that passed last moving second. If only one program is willing (or able) to resume play, then the other program is assumed to make only passes.
5. As soon as all resumed play has ended and if the players still disagree in 3.7.2, then the tournament director decides which stones, if any, are removed according to 3.9. Then after removing, if any, the game is scored due to 3.8.

3.8 Scoring

Each black or white intersection counts as a point for its respective colour. Each empty intersection which is part of an empty block adjacent only to intersections of one colour counts as a point for that adjacent colour.

The score³ is determined by:

$$score = black\ points - (white\ points + komi)$$

If the score is positive Black wins the game, if the score is negative White wins the game, otherwise if the score is zero the game is drawn.

3.9 Removal by the tournament director

In principle the tournament director may decide the outcome of the game based on perfect hypothetical play-out. However, since it may be unlikely that programs would be able to execute such a perfect strategy, it is recommended to remove only the most obvious disputed blocks in accordance with 3.9.1 and 3.9.2, and leave all others on the board.

³Notice that we use normal full counting; to obtain the Chinese half counting score simply divide by two.

3.9.1 Definitions for default removal

One-sided moving consists of moves that may play stones on the board for one colour only (the other colour always passes). Alternate moving consists of alternating moves of both colours. A region is a set of connected intersections regardless of colour. The maximal local region of a block is the maximal connected set of intersections that can become adjacent to, or part of, that block under continued one-sided moving of its colour. Moving is local if all moves are played in one local region, passes are also allowed.

A block that can be removed under local alternate moving in its maximal local region, with its colour moving first, is locally capturable. A block for which no strategy exists to remove it under one-sided moving of the opposing colour is pass-alive. A block for which no strategy exists to become pass-alive under one-sided moving of its colour has at most one eye.

3.9.2 Default removal

Any disputed block that has at most one eye and is locally capturable shall be removed.⁴ Blocks, unaffected by disputes, that both programs consider removable shall be removed accordingly.

3.10 Other issues

3.10.1 Automatic play

The operators are responsible for the communication between the programs. If both operators agree, they may use an automatic communication procedure, such as a serial cable or network connection, to communicate the moves between the programs. In case of a dispute, programs must be able to undo moves and to continue operated manually.

3.10.2 Exceptional moves

If a program plays/transmits an illegal move the clocks are stopped and the tournament director (TD) must be called to the board. Once the TD has assessed the situation he may allow the operator(s) to undo the illegal move, and make a pass instead. If this is not possible, and/or the game cannot be continued normally, then the program that made the illegal move loses the game. If a program makes an illegal move for the second time in one game it loses immediately.

If a program makes a play that invokes the long cycle rule and if the TD agrees, then the operator may undo the play and make a pass instead.

⁴Notice that this removes moonshine life, but leaves bent four in the corner on the board. Regular seki's are not removed.

If a program makes a play that invokes the long cycle rule and the other program is unable to execute the repeating play, then the game is decided by the long cycle rule regardless of whether the other program accepts the repeating play.

3.10.3 Timing

In principle the timing is as outlined by section 1, and the general Olympiad rules. In case of a dispute the clocks may be stopped, until alternate moving resumes. The TD may decide to grant extra time for playing out disputes.

References

- [1] J. Davies. The rules of Go. In R. Bozulich, editor, *The Go Player's Almanac 2001*, pages 191–194. Kiseido Publishing Company, 2001.