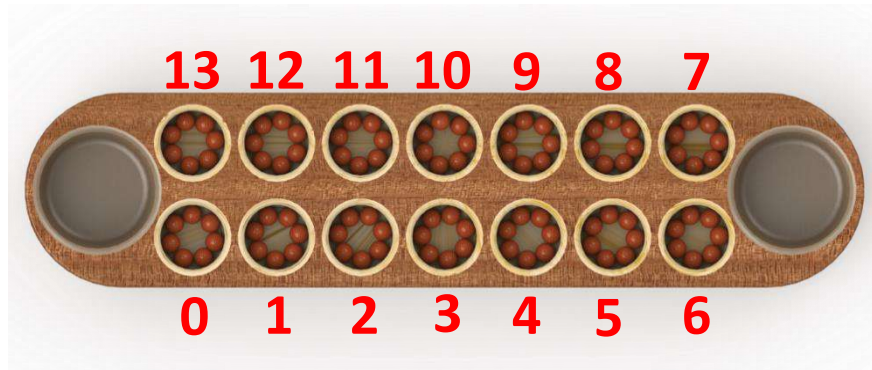


GAME PREPARATION

This game is played by two players.

The game starts with a board consist of $2*N$ small holes and 2 big holes (see picture for $N = 7$). And every small hole is filled by N stones, the big holes are left empty. Both players agree on what number should be used for N , usually, N is chosen as 5, 6, or 7.

Players decide who goes first (by any means) and starts his/her turn. The small hole with the number 0 through $N-1$ and the big hole at the right side of the board belongs to the player who goes first while the small hole with the number N through $2*N-1$ and the big hole at the left side of the board belongs to the other player.



GAME STEPS

Every turn, the turn player selects 1 of his/her small hole with at least 1 stone, let's call it the "starting hole" (if the turn player cannot do it because all of his/her hole is empty, then he/she ends the turn and pass the turn to the opponent).

Then the turn player takes all stones in the "starting hole" and put that stones one by one to every hole next to the "starting hole" (including the turn player's big hole but not the opponent's big hole) in a counter clock-wise direction until they ran out. This activity is called "rotation".

After that, both players check the board's state.

The last hole that the turn player is able to put a stone in it determines the next continuation of the game:

1. If the last hole is the turn player's big hole, the turn player ends the turn and gets the turn again (the opponent's turn is skipped).
2. If the last hole is a small hole and contains only 1 stone, 2 scenarios can happen:
 - a. If the last hole is the turn player's small hole AND the hole across of it is not empty, the turn player takes all stones in the last hole and the hole in front of it, puts all of that stones to his/her big hole. This activity is called "shooting". Then the turn player ends the turn and passes the turn to the opponent.
 - b. If the last hole is the turn player's small hole AND the hole across of it is empty, ends the turn and pass the turn to the opponent.
 - c. If the last hole is the opponent's small hole, ends the turn and pass the turn to the opponent.

3. If the last hole is a small hole and contains more than 1 stone, the turn player does the “rotation” again but with the last hole as his/her “starting hole” for that “rotation”.

The game ends when one of the players achieves the win condition.

WIN CONDITION

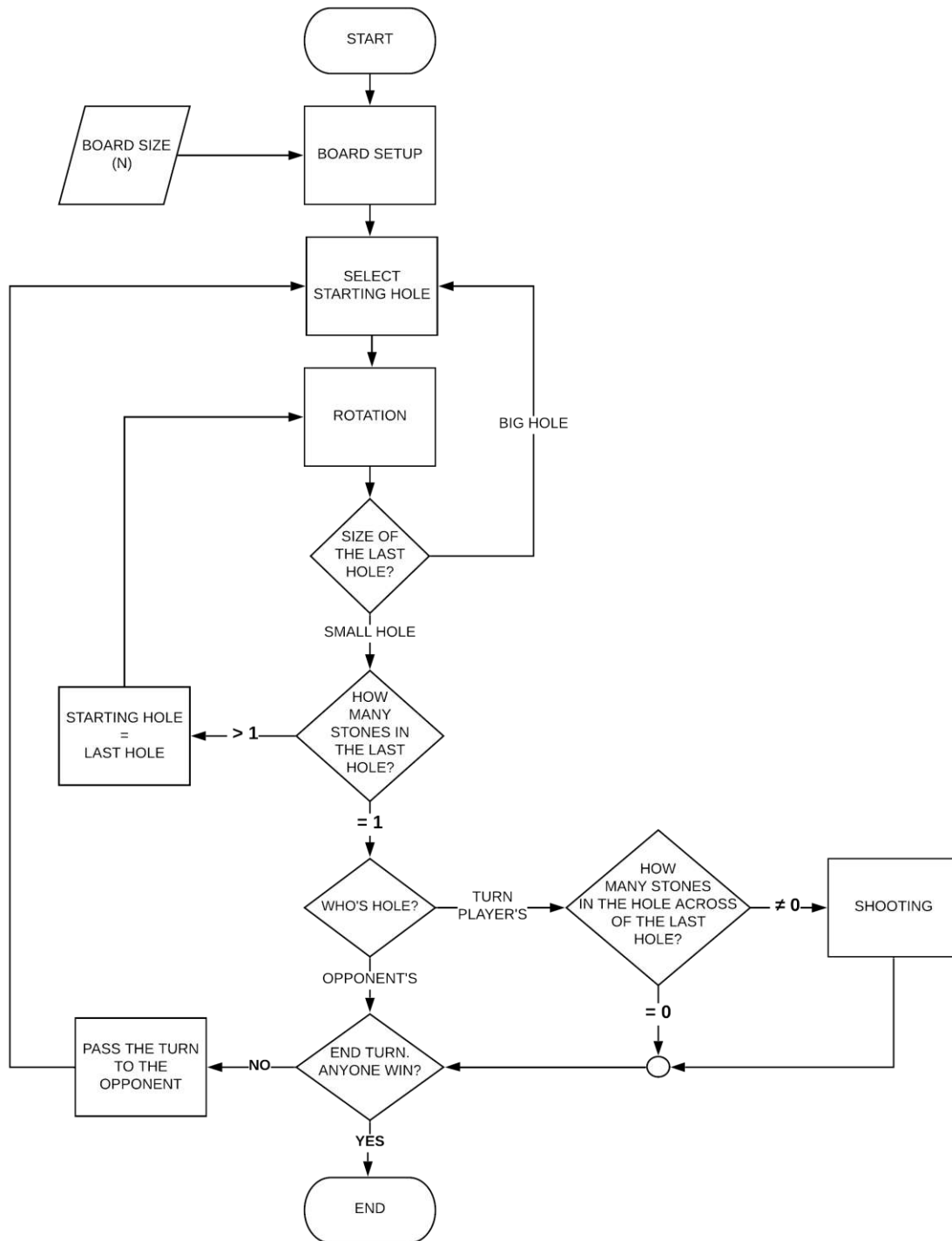
Any player who can get more than half ($> N^2$) of the total stones on the board inside his/her big hole at the end of his/her turn first is considered as the winner.

FLAW OF THE RULE

There is a big flaw in this rule that benefits the player who goes first. Basically the ‘If the last hole is a small hole and contains more than 1 stone, the turn player does the “rotation” again but with the last hole as his/her “starting hole” for that “rotation”’ rule broke the game as any player who goes first can win the game instantly by abusing a certain move order as explained by Kasim in his paper (Kasim, 2017) to keep playing without passing turn to opponent once. To patch this flaw, Kasim suggested to change that rule to ‘If the last hole is a small hole and contains more than 1 stone AND is the turn player’s hole, the turn player does the “rotation” again but with the last hole as his/her “starting hole” for that “rotation”’. This means that if the last hole is the opponent’s small hole then the turn player has to end his/her turn (before the patch he/she does the “rotation” again regardless of who is the owner of the hole).

FLOWCHART

This is the flowchart of the game (with original rule, not with the one proposed by Kasim) to make it easier to understand (if the turn player cannot select any hole as the starting hole because all of his/her hole is empty, then he/she cannot enter the “SELECT STARTING HOLE” step and goes directly to the “END TURN” step).



REFERENCES

Kasim, M. F. (2017). Playing the game of Congklak with reinforcement learning. *Proceedings of 2016 8th International Conference on Information Technology and Electrical Engineering: Empowering Technology for Better Future, ICITEE 2016*. <https://doi.org/10.1109/ICITEED.2016.7863309>