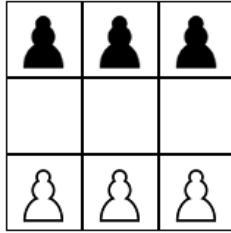
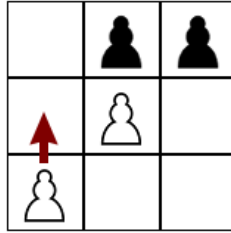


Hexapawn

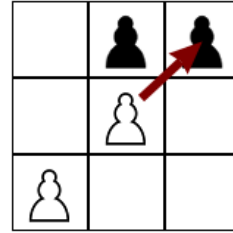
Hexapawn is a turn-based game using six chess pawns on a 3×3 board. White moves first. A piece can either move forward if the space in front of it is empty, or capture an opponent's piece diagonally.



(a) Starting position



(b) A forward move



(c) Capture diagonally

A player wins when:

- (1) One of their pawns reaches the other side
- (2) They capture all of their opponent's pieces
- (3) It is their opponenet's turn and there is no legal move

Hexapawn is a *solved* game, meaning that we can calculate an optimal move for any given position. Get started playing and see if you can “solve” the game before attempting the questions below.

1. Is it possible to draw (tie) in hexapawn?
2. Does one side have the advantage?
3. What is the shortest game possible (fewest moves)?
4. What is the longest game possible (most moves)?
5. How many unique positions are possible after the first move (only white moves)?
6. How many unique positions are possible after the first two moves (white moves then black moves)?
7. Give an example of a position that is impossible to reach.
8. If white's first move is to move their left-most pawn forward, then what is black's worst response? What is black's best response?
9. If white's first move is to move their center pawn forward, then what is black's worst response? What is black's best response?
10. How many unique games are possible? Here, a game is represented by a sequence of moves.