AI LITERACY · A GAME FOR TWO

The Crocodile That Learns

One of you plays the monkeys. The other is a computer made of paper that plays the crocodiles. The computer starts out knowing only the rules and picks its moves at random. Can it learn to beat you?

The game

- Each piece moves **one square straight forward** into an empty square.
- A piece captures **one square diagonally forward**. It can't capture straight ahead.
- Monkeys move up the board. Crocodiles move down.

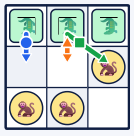
You win if one of your pieces reaches the far row, **or** you capture every enemy piece, **or** it's the other side's turn and they can't move.

Set up

1. Sit side by side with the board in front of you, crocodiles at the top, so the board looks like the cards.
2. Put the monkeys on the bottom row and the crocodiles on the top row.
3. The crocodile player lays out the 19 move cards. Each card shows a board and the crocodiles' possible moves as coloured arrows.
4. Put one token on each card for every arrow, matching the colour and shape.

Playing a game

1. **Monkeys** always go first and can make any legal move.
2. **Crocodiles:** find the card that matches the board. Cards are grouped by the crocodiles' 1st, 2nd and 3rd move.
3. Close your eyes and pick one token from that card. Make the move with the arrow of the same colour.
4. Put the token on the card's board picture, so you remember which move you made.
5. Keep taking turns until someone wins.



If the board is the **mirror image** of a card (left and right swapped), use that card and swap the move too.

After each game, the computer learns

Crocodiles lost
Take away the token from the crocodiles' **last** move. The monkey player keeps it. That move is now less likely.

Crocodiles won
Add one **extra** token of the same colour to the card of their last move. That move is now more likely.

A card is empty
The crocodiles give up and the monkeys win. Take away the token from the crocodiles' move **before** that one.

Then put every token you used back on its card and play again. Monkeys: try to win every game! Record each result in the learning log.

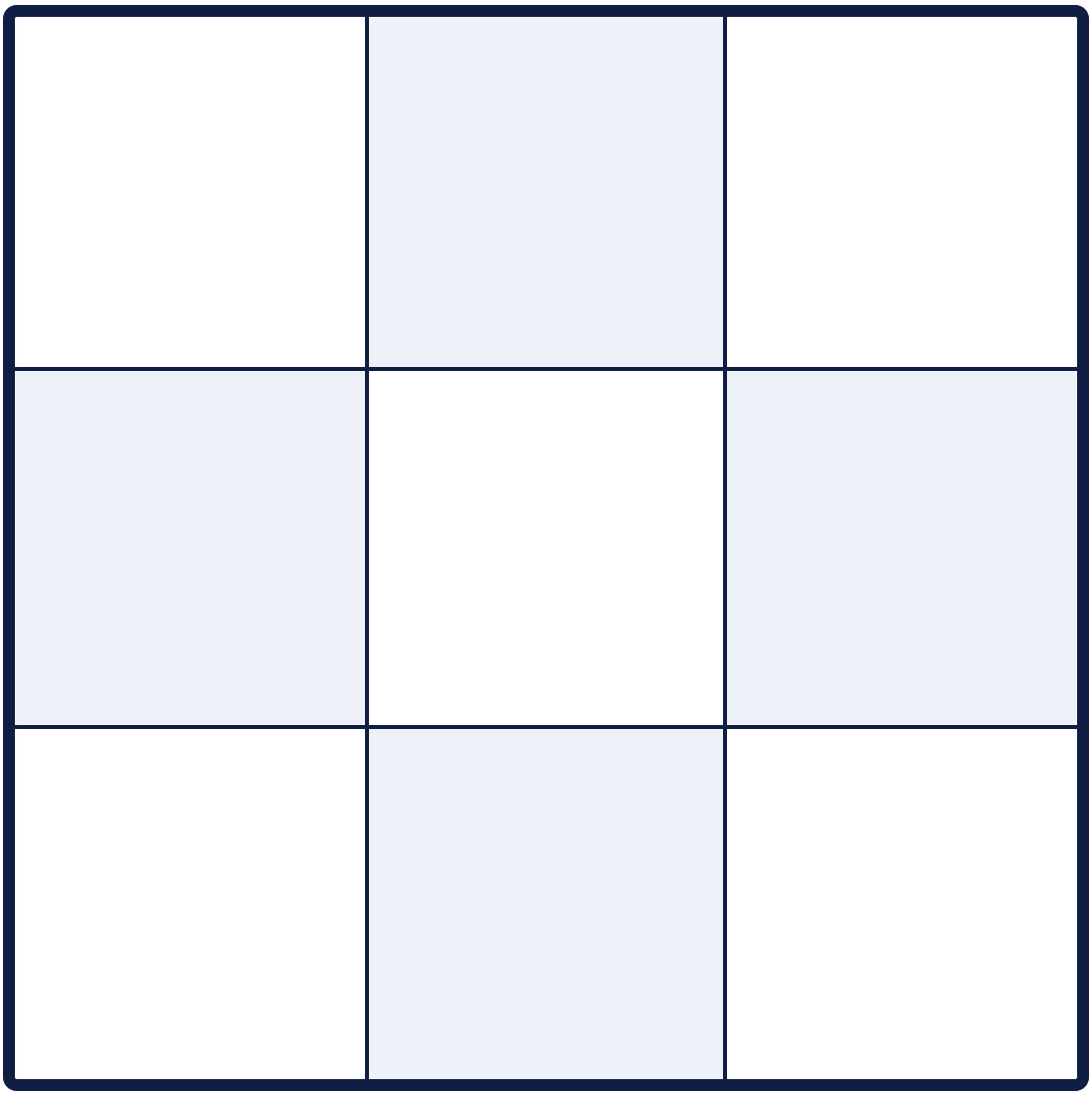
Tokens: Blue · Orange · Green · Purple

Adapted from "Beat the Crocodile" by Annabel Lindner and Stefan Seegerer (AI Unplugged), CC BY-NC 3.0

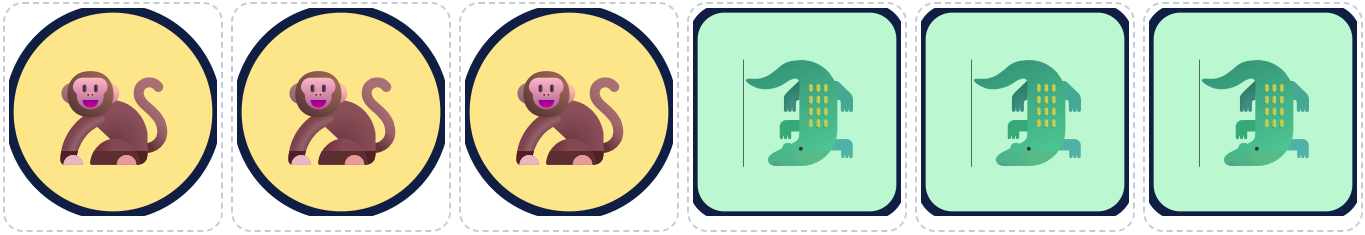
The board

One board, three monkeys and three crocodiles for each pair. Cut out the pieces.

🐊 Crocodiles start here · they move down ↓



🐒 Monkeys start here · they move up ↑



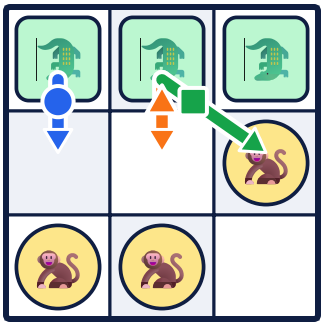
Adapted from “Beat the Crocodile” by Annabel Lindner and Stefan Seegerer (AI Unplugged), CC BY-NC 3.0

Move cards

Find the card that matches the board. Each arrow is a move the crocodiles can make.

1st move

Card 1

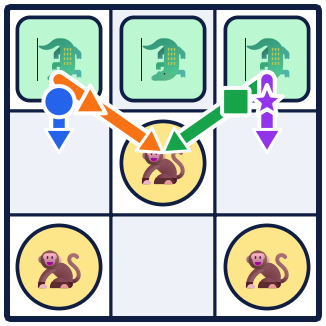


Start with these 3 tokens.

Tokens go here

1st move

Card 2

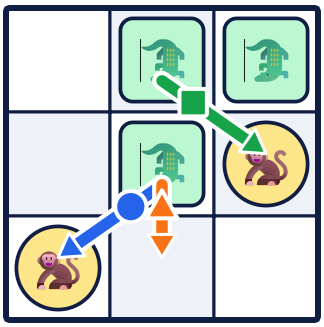


Start with these 4 tokens.

Tokens go here

2nd move

Card 3

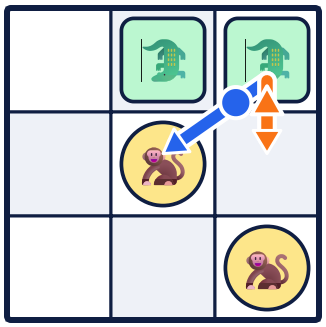


Start with these 3 tokens.

Tokens go here

2nd move

Card 4

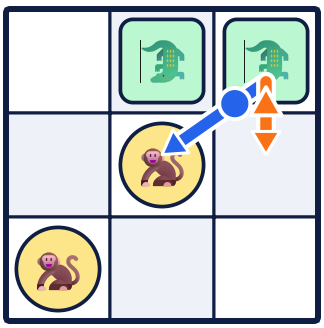


Start with these 2 tokens.

Tokens go here

2nd move

Card 5

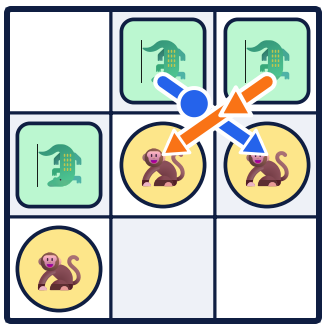


Start with these 2 tokens.

Tokens go here

2nd move

Card 6

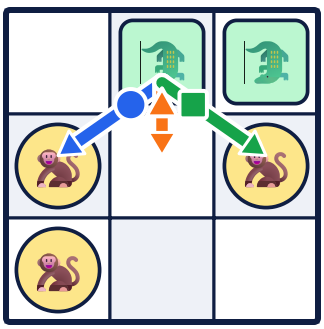


Start with these 2 tokens.

Tokens go here

2nd move

Card 7

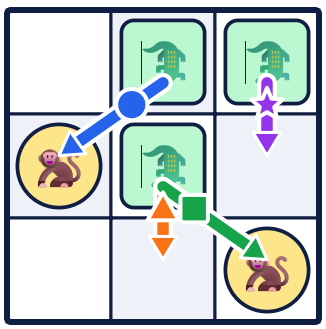


Start with these 3 tokens.

Tokens go here

2nd move

Card 8



Start with these 4 tokens.

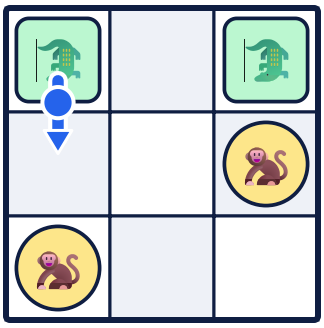
Tokens go here

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Move cards (continued)

2nd move

Card 9

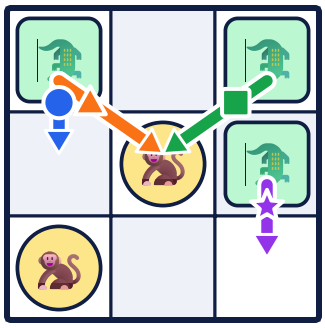


Start with this token.

Tokens go here

2nd move

Card 10

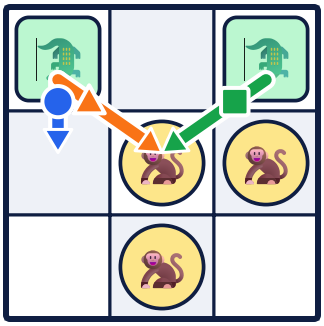


Start with these 4 tokens.

Tokens go here

2nd move

Card 11

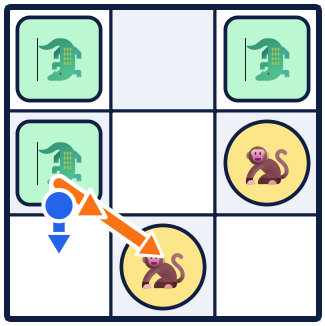


Start with these 3 tokens.

Tokens go here

2nd move

Card 12

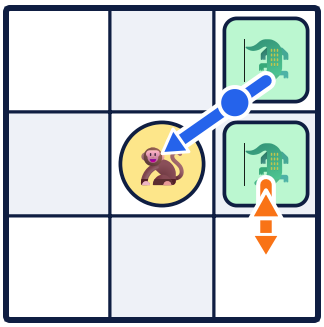


Start with these 2 tokens.

Tokens go here

3rd move

Card 13

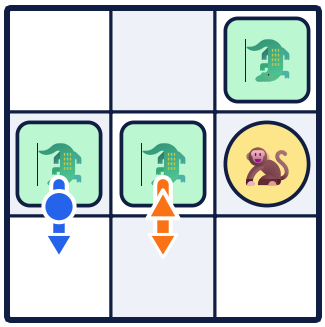


Start with these 2 tokens.

Tokens go here

3rd move

Card 14

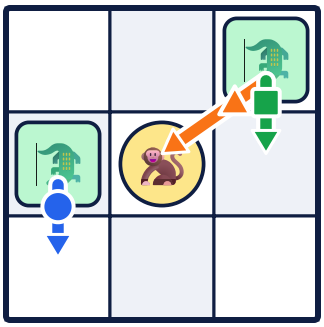


Start with these 2 tokens.

Tokens go here

3rd move

Card 15

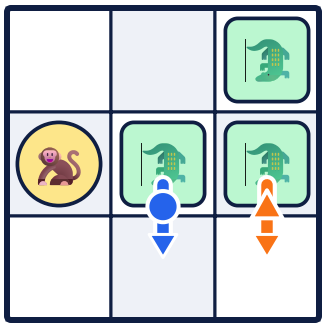


Start with these 3 tokens.

Tokens go here

3rd move

Card 16



Start with these 2 tokens.

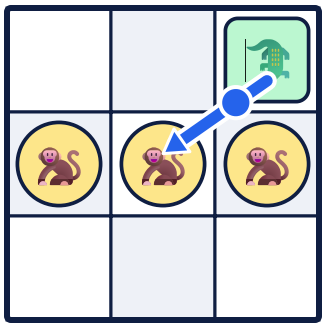
Tokens go here

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Move cards (continued)

3rd move

Card 17

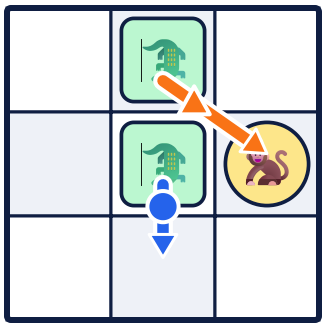


Start with this token.

Tokens go here

3rd move

Card 18

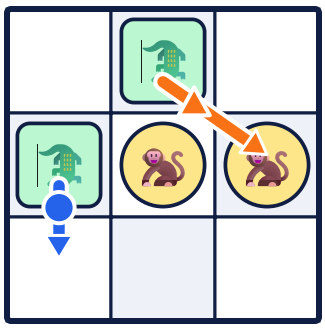


Start with these 2 tokens.

Tokens go here

3rd move

Card 19



Start with these 2 tokens.

Tokens go here

Learning log

After each game, tick the winner and write how many games the crocodiles have won so far.

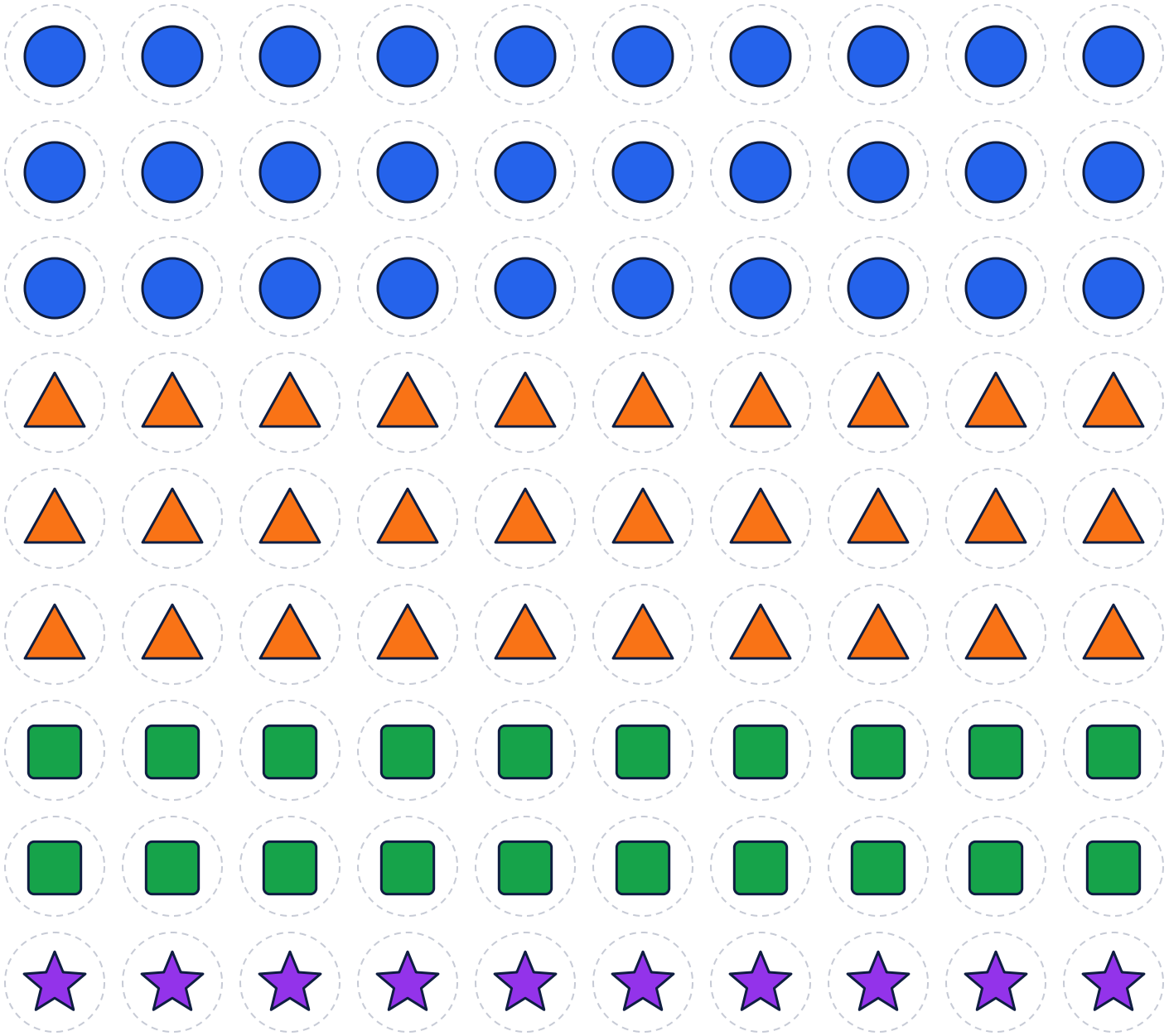
Game	Winner	Croc wins so far
1	☐ Monkeys ☐ Crocodiles	
2	☐ Monkeys ☐ Crocodiles	
3	☐ Monkeys ☐ Crocodiles	
4	☐ Monkeys ☐ Crocodiles	
5	☐ Monkeys ☐ Crocodiles	
6	☐ Monkeys ☐ Crocodiles	
7	☐ Monkeys ☐ Crocodiles	
8	☐ Monkeys ☐ Crocodiles	
9	☐ Monkeys ☐ Crocodiles	
10	☐ Monkeys ☐ Crocodiles	

Game	Winner	Croc wins so far
11	☐ Monkeys ☐ Crocodiles	
12	☐ Monkeys ☐ Crocodiles	
13	☐ Monkeys ☐ Crocodiles	
14	☐ Monkeys ☐ Crocodiles	
15	☐ Monkeys ☐ Crocodiles	
16	☐ Monkeys ☐ Crocodiles	
17	☐ Monkeys ☐ Crocodiles	
18	☐ Monkeys ☐ Crocodiles	
19	☐ Monkeys ☐ Crocodiles	
20	☐ Monkeys ☐ Crocodiles	

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Paper tokens

Cut along the dashed circles. You can also use coloured counters, beads or wrapped sweets: you need 19 blue, 17 orange, 8 green and 3 purple to start, plus spares for wins.



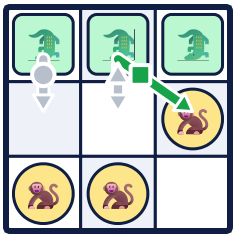
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FOR EDUCATORS

Answer key: the trained crocodile

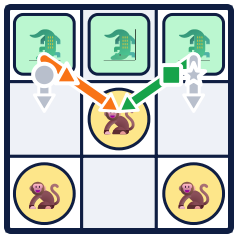
Grey arrows are moves a perfect monkey player can always beat. After enough games these tokens disappear and the crocodiles become unbeatable, because in this game the second player can always win.

1st move 1



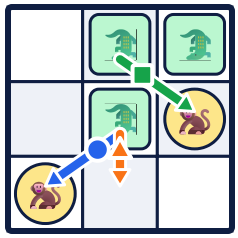
1 of 3 moves safe.

1st move 2



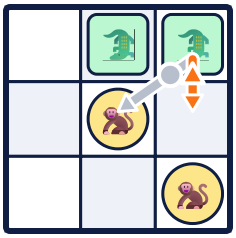
2 of 4 moves safe.

2nd move 3



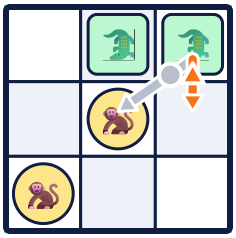
All 3 moves safe.

2nd move 4



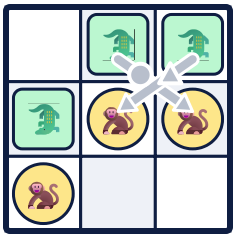
1 of 2 moves safe.

2nd move 5



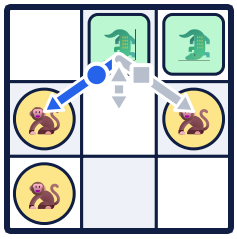
1 of 2 moves safe.

2nd move 6



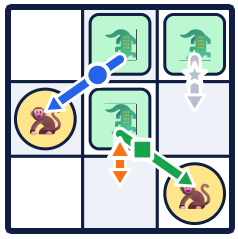
Empties. Every move loses.

2nd move 7



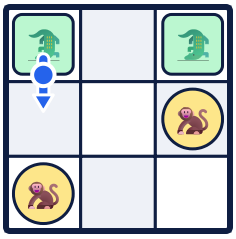
1 of 3 moves safe.

2nd move 8



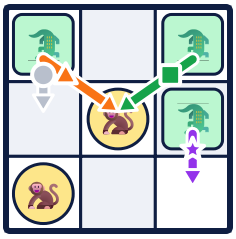
3 of 4 moves safe.

2nd move 9



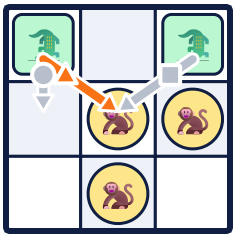
All moves safe.

2nd move 10



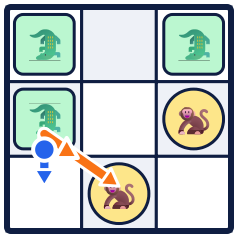
3 of 4 moves safe.

2nd move 11



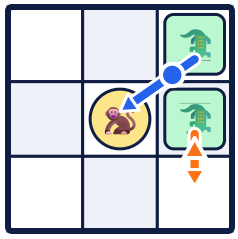
1 of 3 moves safe.

2nd move 12



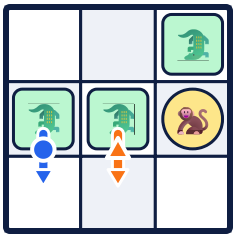
All 2 moves safe.

3rd move 13



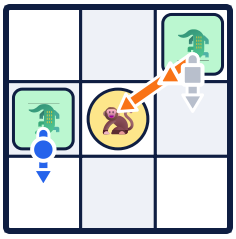
All 2 moves safe.

3rd move 14



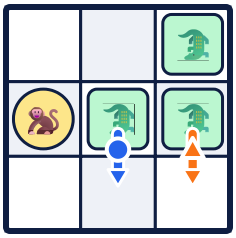
All 2 moves safe.

3rd move 15



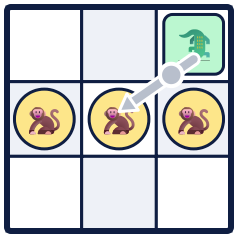
2 of 3 moves safe.

3rd move 16



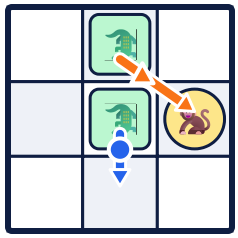
All 2 moves safe.

3rd move 17



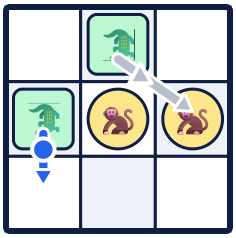
Empties. Every move loses.

3rd move 18



All 2 moves safe.

3rd move 19



1 of 2 moves safe.

Card 6 can run out of tokens: then the crocodiles give up, and the token for their move before it is removed. Card 17's only move also loses, so the trained crocodile learns to avoid both boards.

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