Games in extensive form (Kuhn tree)

Tree of states: at each node, one player makes a move to a child vertex.

- Alice  O Bob moves
- Terminal state.
- \([0,-1]\): Alice wins
- \([a,b]\): payoff \(a, b\)

Tree: no cycles. If multiple ways to reach same position, multiple copies in the tree.
Tree can be very large, even for simple games.

Chomp!
can evaluate positions from bottom up.

If Bob has moves to states with values \((a, b)\), then he moves to the one with maximal \(b\).
Can assume alternate moves:

Mutually Assured Destruction

with Doomsday device:
Alternate: Add 1 to pot or stop.
If you stop after $n$ moves: you get $n+1$.

After $N$ steps: must stop. \((N, N)\).

e.g. $N=20$.
100 pirates split 100 gold coins.
Ordered: strongest (captain) to weakest.
Captain makes a proposed split, put to a vote.
If passes ($\geq \frac{1}{2}$ vote yes): split as proposed.
If fails: Overthrow captain, repeat.

Q: What happens?