The algorithm to find SPNE is quite simple.

① SPNE is guaranteed to exist in finite PEGs (requires proof).

② An SPNE is a PSNE — found a class of games where PSNE is guaranteed to exist.

③ The algorithm does not require any parameters and just returns all Nash equilibria without assuming any strategy for the players.

Disadvantages:
- The algorithm has no way of finding all Nash equilibria without knowing the best actions.
- It can be computationally expensive (or maybe impossible).
- Every Nash equilibrium is a Pure Strategy Nash Equilibrium (PSNE).

The idea of subgame perfection is inherently based on backward induction.

Theorem: best-tilt(h) = BACK-IND(h)

if util-at-child(h, a) > best-tilt(h) then
  util-at-child(h, a) ← util-at-child(h, a)
else
  util-at-child(h, a) ← best-tilt(h)

for all a ∈ X(h) do
  if util-at-child(h, a) > best-tilt(h) then
    best-tilt(h) ← util-at-child(h, a)
  else
    best-tilt(h) ← best-tilt(h)

function BACK-IND(history h)
**Centipede game**

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
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\[1,0 \quad D,2 \quad 3,1 \quad 2,4 \quad 4,3\]

3, 5

What is/are the SPNE(s) of this game?

What is the problem with that prediction?

This game has been experimented with various populations — random participants, university students, grandmasters.

Most of the subjects (except grandmasters) continue till a few rounds.

Reasons claimed: altruism, limited computational capacity of individuals, incentive difference.

Criticism of the principle of SPNE

It talks about "what action if the game reached this history" but the equilibrium in some stage above can show that it "cannot reach that history".

Extension using the idea of player beliefs.