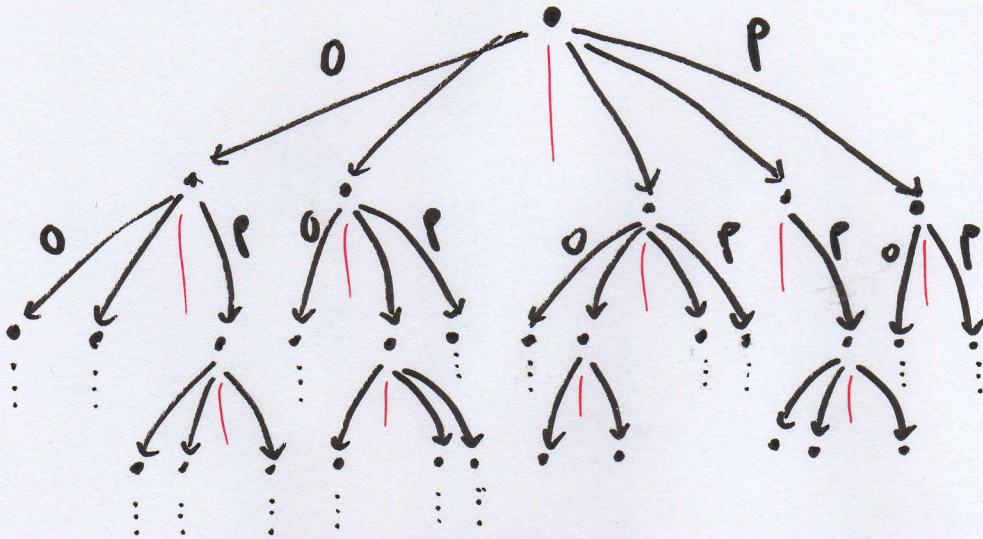


# Conway Games

A Conway game is a tree :



- \* each node is a position
- \* each edge is a move
- \* a play is a path from the root

By convention, moves pointing left are by Opponent;  
and moves pointing right are by Player.



Formally, a Conway game is a triple

$$G \triangleq \langle M_G, \lambda_G, P_G \rangle$$

where

- \*  $M_G$  is a (countable) set of moves
- \*  $\lambda_G: M_G \rightarrow \{0, P\}$  is the labelling function
- \*  $P_G \subseteq M_G^*$  is a set of words/strings over  $M_G$  satisfying

(p1)  $\epsilon$ , the empty string, is in  $P_G$

(p2)  $P_G$  is prefix-closed

The set  $P_G$  specifies the game tree.

Ex  $\perp \triangleq \langle \emptyset, \emptyset, \{\epsilon\} \rangle$ , the empty game

$\perp \triangleq \langle \{z\}, z \mapsto 0, \{\epsilon, z\} \rangle$

$\perp^* \triangleq \langle \{z\}, z \mapsto 0, \{\epsilon, z, zz, zzz, \dots\} \rangle$

$\text{bool} \triangleq \langle \{z, \#, \# \}, z \mapsto 0, \{\epsilon, z, z\#, z\#\# \} \rangle$   
 $\#, \#\# \mapsto P$

