

15-150

for the gamers

- 2 player
- deterministic
- perfect information
- zero-sum
- finitely branching

start w/  $X$  coins

alternate turns

take 1, 2, or 3 coins

or win if no coins

Node — game state  
(# of coins)

Edge — move

$$\max(1/2, 1/2, 0) = 1/2$$

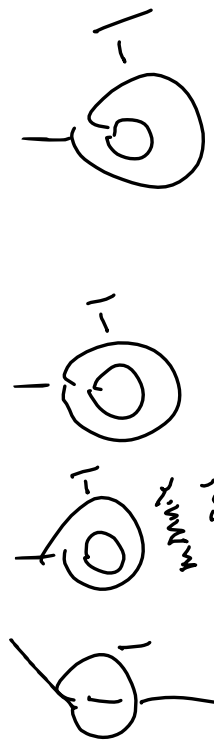
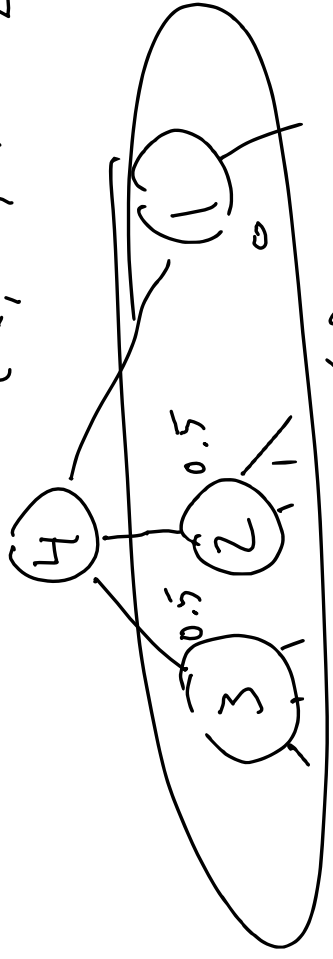
maxie

minie

maxie

minie

maxie



120

(ches)

$n \approx 10$

$d \approx 80$

maxie wins

minie wins

$$\text{time} \in \Omega \left( \max \left( \frac{v}{\rho}, s \right) \right)$$

10<sup>120</sup>

80

What if not whole tree?



Minimax;

has:

- game tree
- estimator
- depth

does:

runs minimax

Estimator;

has:

estimate (noun)

does:

estimate : game state →  
(verb) estimate

compare

Game:

has:

state

move

outcome

does:

make move: state \* move  $\rightarrow$  state

get valid moves

Player

has:

understanding of Game

does:

choose move

Controller (Arena)

has:

Game

2 players

does:

play

