

## Osborne-rubinstein100.1

OR 100.1

Show that SPNE need not exist if a game is infinite

Show that

① finite horizon is not sufficient

② infinite horizon, but finitely many actions, is not sufficient

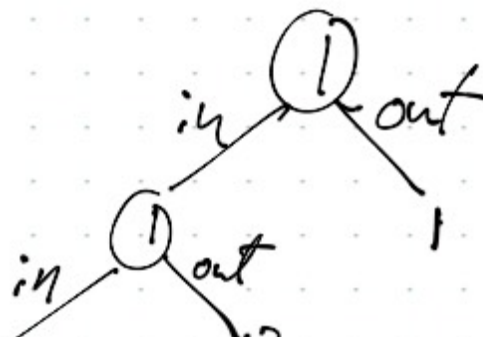
Intuitively: both horizons and action spaces must be finite

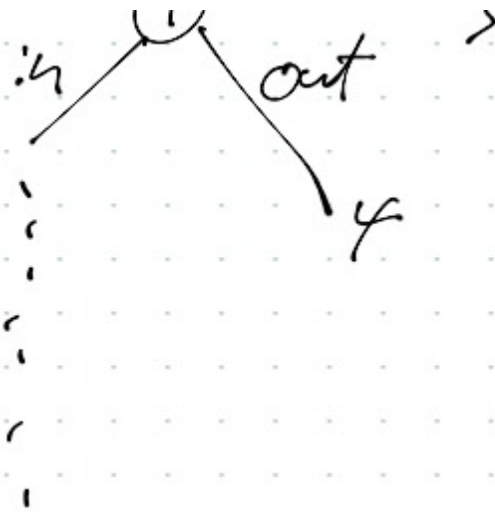
Now let's cook up counter examples. Both examples will only have 2 players.

$$\forall x, u_1(x' = x + \varepsilon) > u_1(x)$$

$\Rightarrow$  no  $x$  is an SPNE

②





$$\forall k, u_1(\{in^k, out\}) = k$$

$$u_1(\{in^{k+1}, out\}) = k+1$$

$\Rightarrow$  ~~A~~ SPNE with  $\{out\}$

$\Rightarrow$  no SPNE