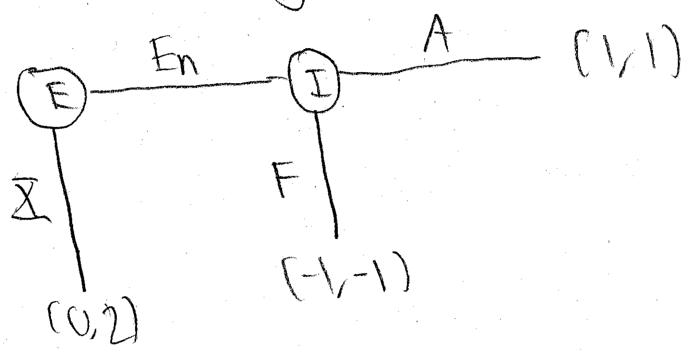
1] No reputation in finitely repeated games with complete info and unique SPE

- Repeated entry deterrence:



- unique SPE with (En, A) in each pd.

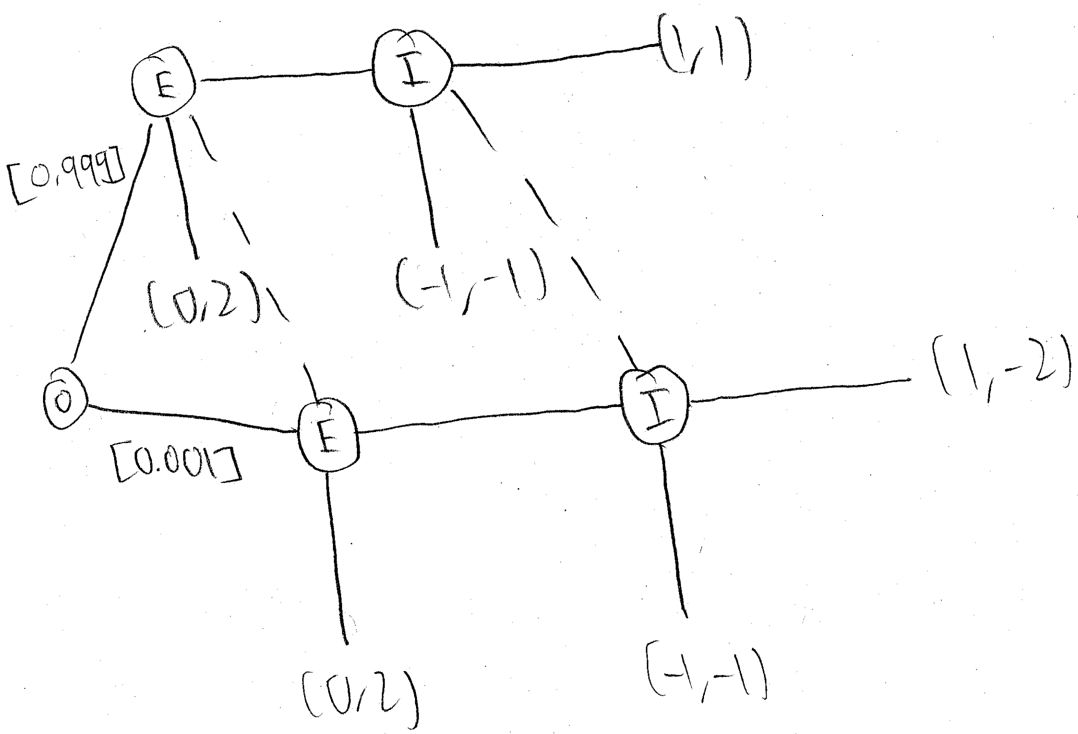
- Centipede game

2] Reputation in infinitely repeated games

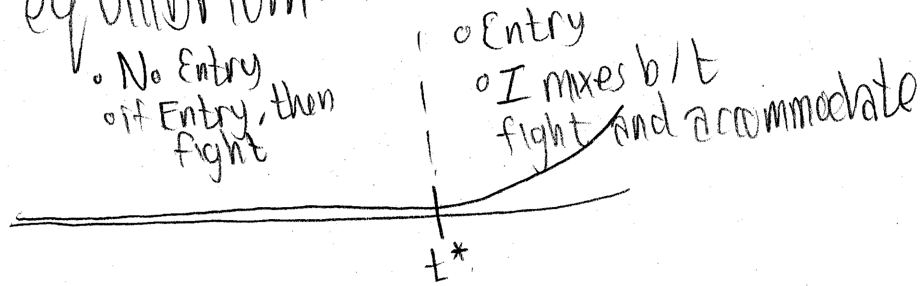
- Problem: Folk theorem
  - Entrant enters iff A ever played in past. Incumbent plays A iff A ever played in the past.
  - This is just one story among infinitely many others.

3] Kreps-Milgrom-Roberts-Wilson: in finite horizon games of incomplete information, reputation may arise in the unique SPE.

- Problem: with two-sided incomplete information, any payoff can be supported.

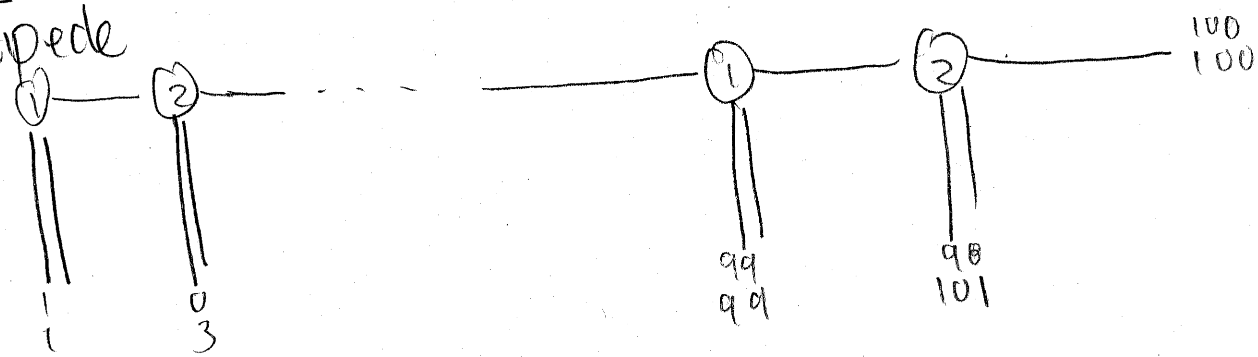


unique equilibrium:

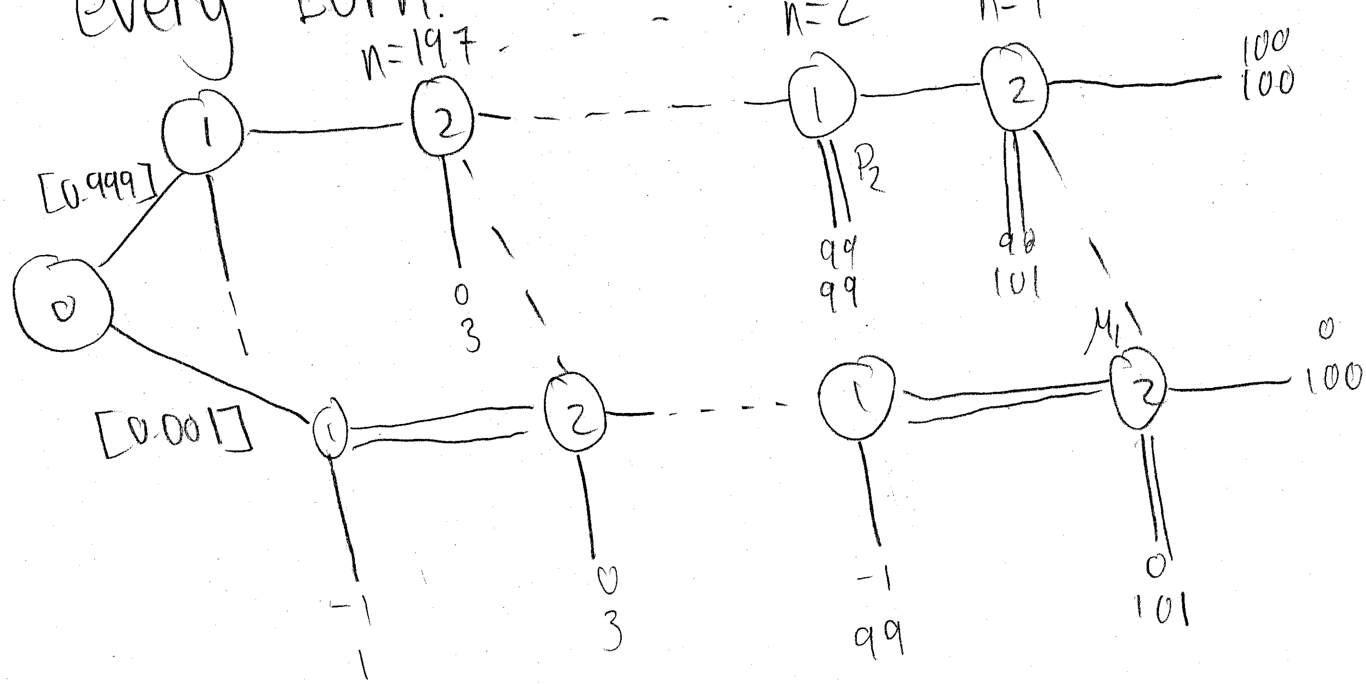


4. Fudenberg and Levine: LR player with incomplete information, NE payoff of LR player must be close to his Stackelberg payoff.

Centipede



- Unique SPE in which everyone drops out in every turn.



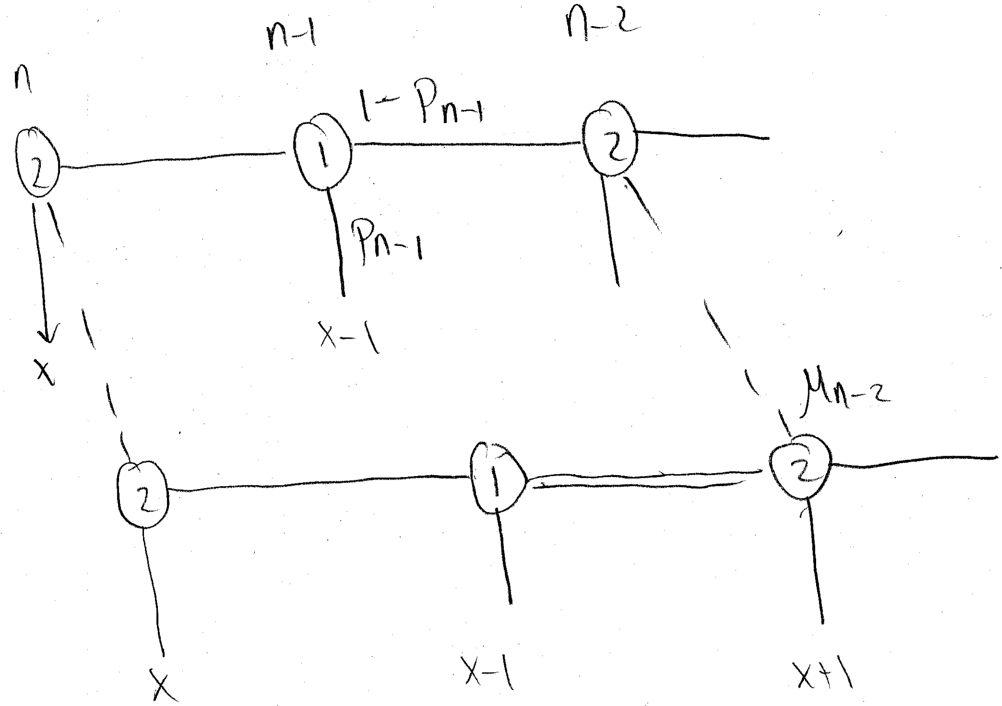
- Facts about sequential equilibria in this game:
  - Every information set for 2 is reached everywhere except at last information set.
  - If 2 strictly prefers to go across at n, then
    - must strictly prefer to go across at n+2
    - posterior at n is just same as prior since both types of player 1 play across with probability one.

- For any $n > 2$, 1 goes across with positive probability.
- If 1 goes across w/Pr 1 at n, then 2's posterior at $n-1$ is her prior.

$\Rightarrow \exists n^*$ s.t. after n^*, both mix. Before n^*, both go across with prob. 1.

Our job now is to determine this n^*.

If 2 is mixing at n (obviously, n is after n^*), then



at n, if play D, get x

if play across, get: $(1-\mu_n)p_{n-1}(x-1)$
$+ (1-(1-\mu_n)p_{n-1})(x+1)$

- Since mixing, must be indifferent, so that

$$x = (1-\mu_n)p_{n-1}(x-1) + (1-(1-\mu_n)p_{n-1})(x+1)$$

$$\Rightarrow 0 = (1-\mu_n)p_{n-1}(-1) + (1-(1-\mu_n)p_{n-1})(1)$$

$$= \pi(-1) + (1-\pi)(1) \Rightarrow \pi = \frac{1}{2}$$

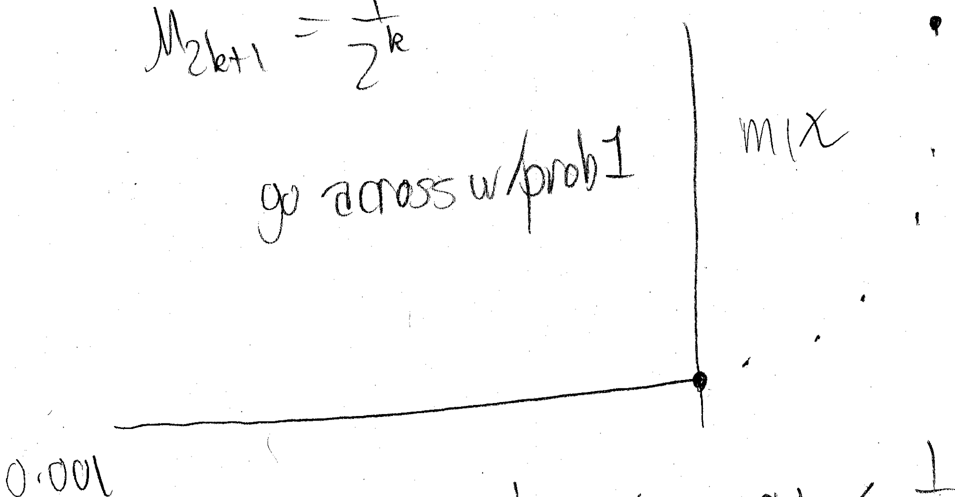
By Bayes' Rule

$$\mu_{n-2} = \frac{\mu_n}{\mu_n + (1-\mu_n)(1-p_{n-1})} = \frac{\mu_n}{\mu_n + (1-\mu_n) - \pi} = \frac{\mu_n}{\frac{1}{2}}$$

$$= 2\mu_n \Rightarrow \mu_n = \frac{\mu_{n-2}}{2}$$

- This gives us $\mu_3 = \frac{1}{2}$, $\mu_5 = \frac{1}{4}$, $\mu_5 = \frac{1}{8}$, ...

$$\mu_{2k+1} = \frac{1}{2^k}$$



k is s.t. $\frac{1}{2^{k+1}} < 0.001 < \frac{1}{2^k}$

$$\Rightarrow k = 9 \Rightarrow 2k+1 = 2(9)+1 = 19$$