



# Strategy, An Introduction to Game Theory

**Week 4: Extensive Form Games,  
Backward Induction, Subgame  
Perfect Equilibrium**

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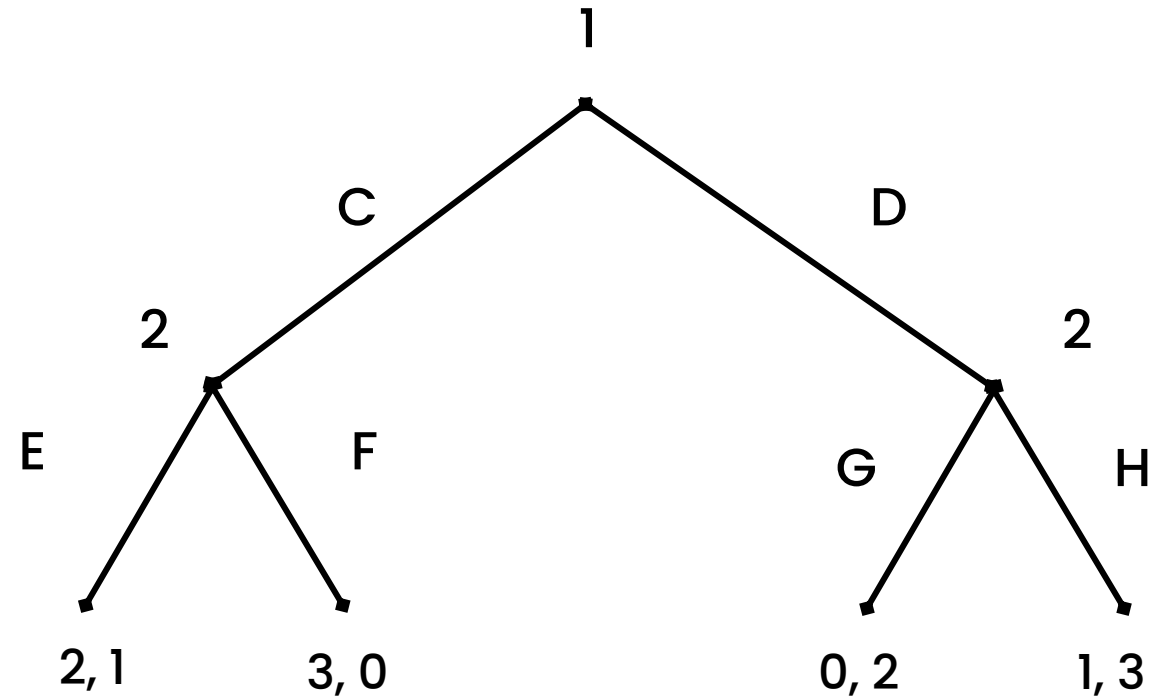
# Recap

- ❖ Dominant Strategies
- ❖ Nash Equilibrium
- ❖ Tragedy of Commons
- ❖ Mixed Strategies
- ❖ Auctions
- ❖ Braess' Paradox
- ❖ Hotelling Model

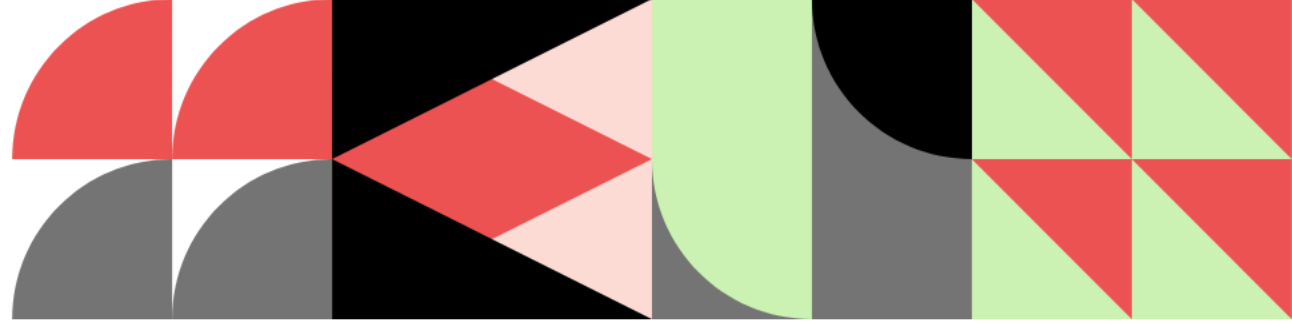
# Backward Induction

Find the Nash Equilibria and Subgame Perfect Equilibria of the following game. Also write this game in Normal form.

[Osborne Ch5, Sec 5.6]

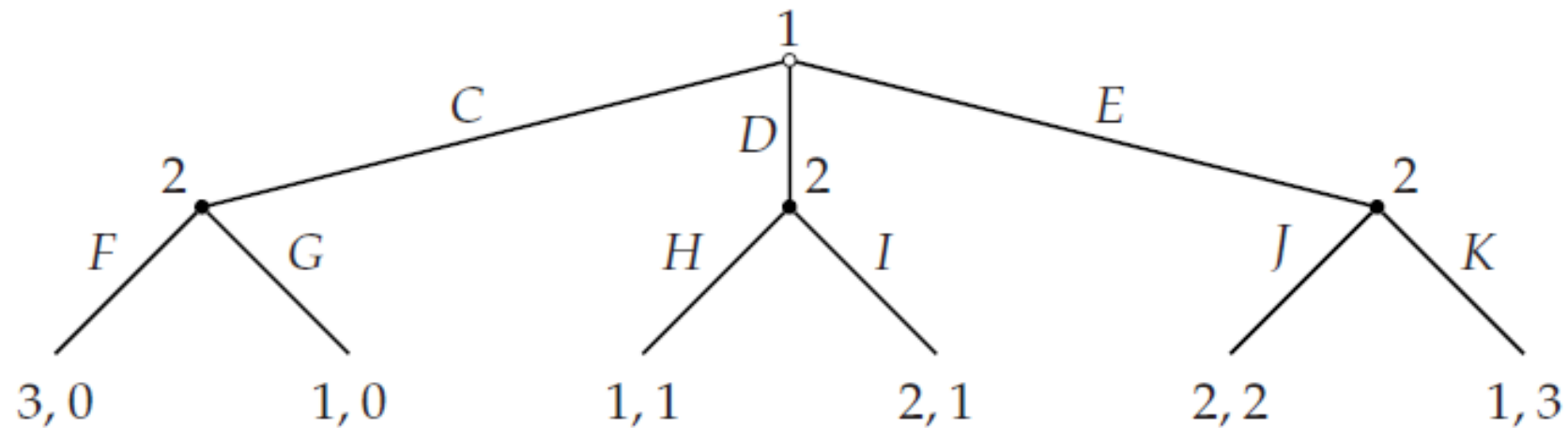


# Backward Induction



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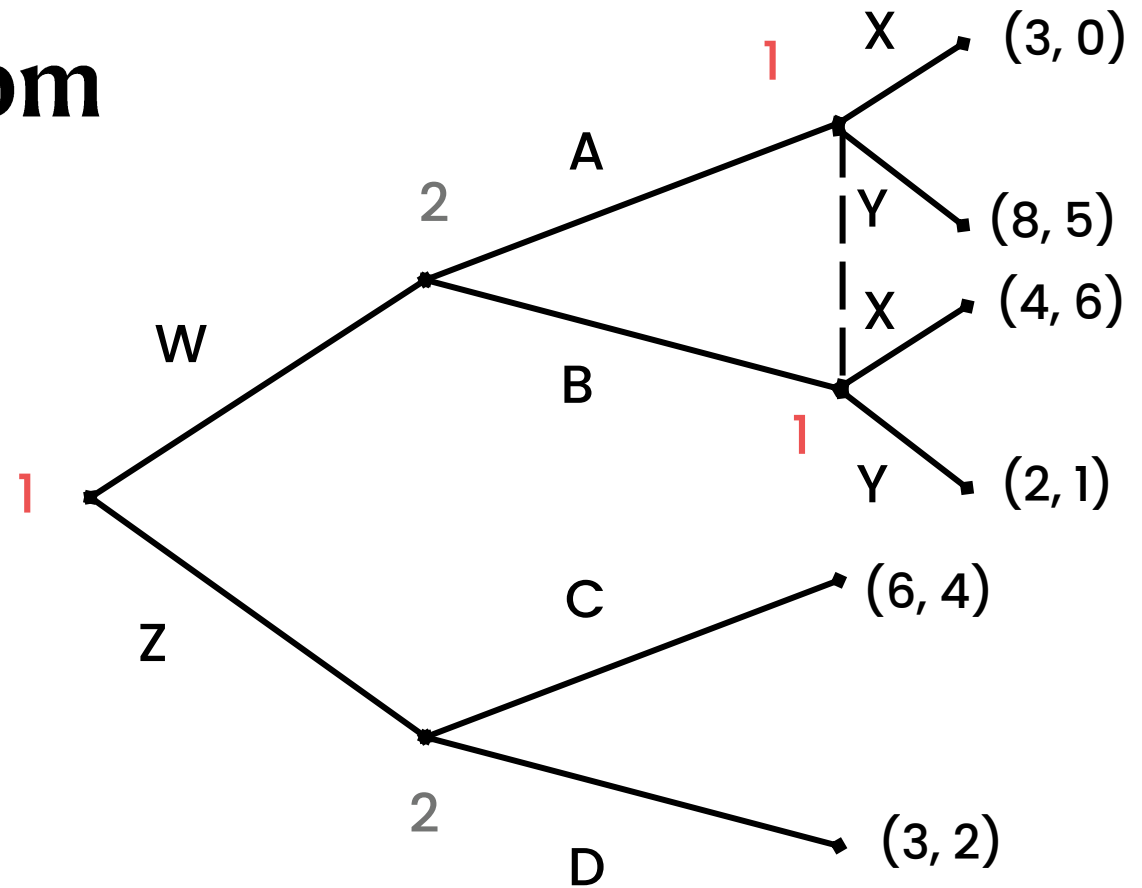


# Subgame Perfect Eqbm

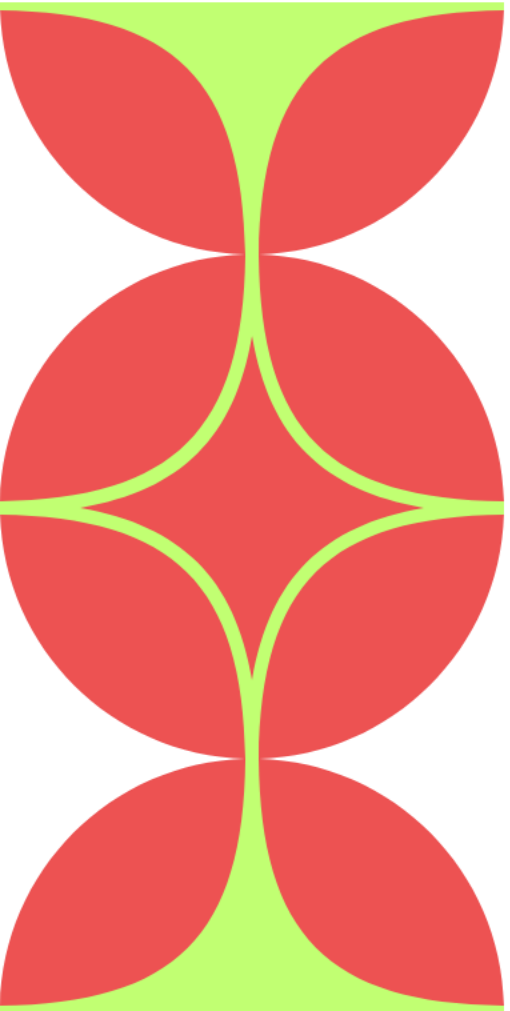
Write this game in  
Normal form.

Find the Nash Equilibria  
and Subgame Perfect  
Equilibria.

[Watson Ch 15, Ex 2(a)]

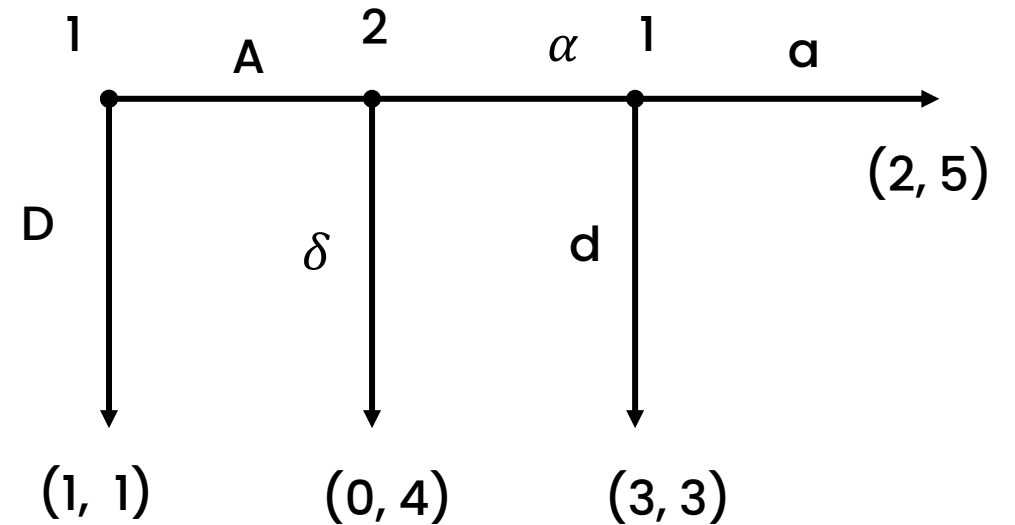


# Centipede-like Game



Write this game in  
Normal form.

Find the Nash Equilibria  
and Subgame Perfect  
Equilibria.



# Ultimatum Game

There is a pie of size  $C$ . Player 1 can offer any part  $x < C$  to player 2. Player 2 can accept or reject the offer. If she accepts the offer, she gets  $x$  and player 1 gets  $C-x$ . If player 2 rejects, both get zero. Find subgame perfect eqbm.





# Stackelberg Game

Find the subgame perfect equilibrium of Stackelberg's duopoly game when  $C_i(q_i) = cq_i^2$  for  $i = 1, 2$ , and  $P(Q) = \alpha - Q$  for all  $Q \leq \alpha$  with  $P(Q) = 0$  for  $Q > \alpha$ .



# Reference Reading

1. ***An Introduction to Game Theory*** by Martin Osborne
2. ***Strategy, An Introduction to Game Theory*** by Joel Watson
3. ***Strategies and Games. Theory and Practice*** by Prajit K. Dutta
4. ***Games of Strategy (3e to 5e)*** by Avinash Dixit, Susan Skeath, David Reiley.

Ebook link (partial)





If you have questions, please contact:

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