Extensive Form Games with with Simultaneous Moves and their Normal Form Representation

Dr. Vimal Kumar, Assistant Professor of Economics

Indian Institute of Technology Kanpur, vimalk@gmail.com

Perfect vs. Imperfect Information

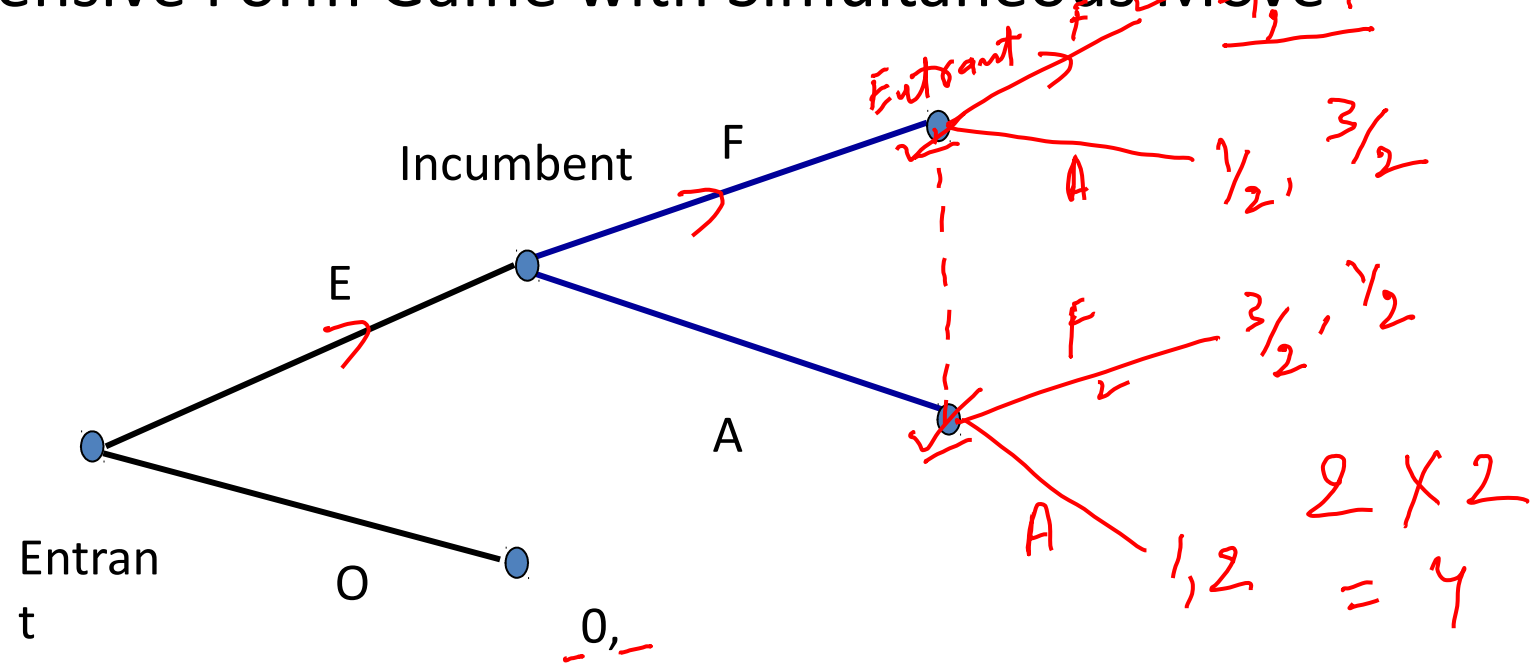
- Perfect Information
  - Players, when making any decision, know of all the events that have previously occurred.
  - All information sets are singleton.
- Imperfect Information:
  - Players when making any decision, may not be perfectly informed about some (or all) of the events that have already occurred.
  - At least one of the information sets is not singleton.
- Common Knowledge: Players know the game structure

Different Game Forms

- Simultaneous Move Game
- Extensive Form Games
  - With Perfect Information
  - With Imperfect Information.
- Entry game with a modification
  - After the entrant enters the market, it does not know whether the incumbent will fight or accommodate
  - The entrant at this stage can also fight or accommodate the incumbent.

Entry Game with Modification

- Extensive Form Game with Simultaneous Move



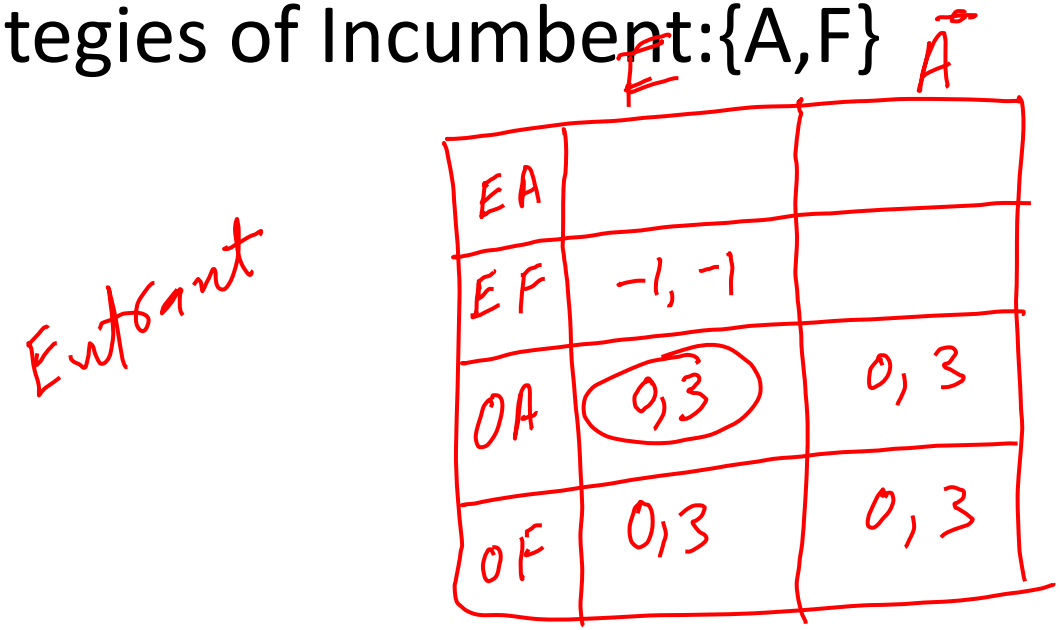
- How to represent this game in the normal form?

Deriving Normal Form from Extensive Form Games.

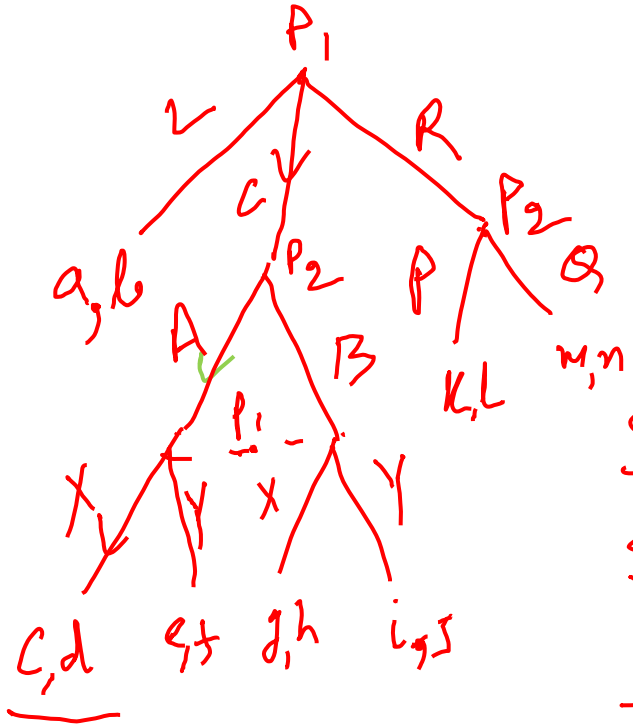
- Step 1: Derive the Number of Strategies for each player.
- Step 2:In case of two players: draw the normal form table. In case of more players: List all the strategy profiles.
- Step 3: Fill in the corresponding pay-offs.

For the Modified Entry Game

- List of Players: {Entrant, Incumbent}
- Strategies of Entrant:{EA, EF, OA, OF}
- Strategies of Incumbent:{A,F}



One More Example



$\rightarrow \{P_1, P_2\}$

$P_1 \rightarrow 3 \times 2 = 6$

$S_1 = \{LX, LY, CX, CY, RX, RY\}$

$S_2 = \{AP, AQ, BP, BQ\}$.

	AP	AQ	BP	BQ
LX	a,b	a,b	a,b	a,b
LY	a,b	a,b	a,b	a,b
CX	c,d			
CY				
RX				
RY				