

## The Draft Game, from Brams and Taylor

Three football teams (X, Y, Z) are involved in a draft for new players. There are six players to choose from (Center, Guard, Tailback, Quarterback, Halfback, Fullback), and the draft works as follows: First X chooses a player, then Y chooses one of the remaining five players, then Z chooses one of the remaining four players (this constitutes the first round of the draft); the same procedure is repeated in the second round, at the end of which all six players are taken.

The teams' preferences are as follows:

	Top choice	Second	Third	Fourth	Fifth	Sixth
X	C	G	T	Q	H	F
Y	H	F	G	C	Q	T
Z	T	F	H	Q	C	G

Assume that the teams all know each others' preferences. Then we can model the draft as a game tree, with team X choosing first &etc. The complete game tree for this draft is quite involved, but *trust me, it all boils down to the game tree shown in Figure 1.*

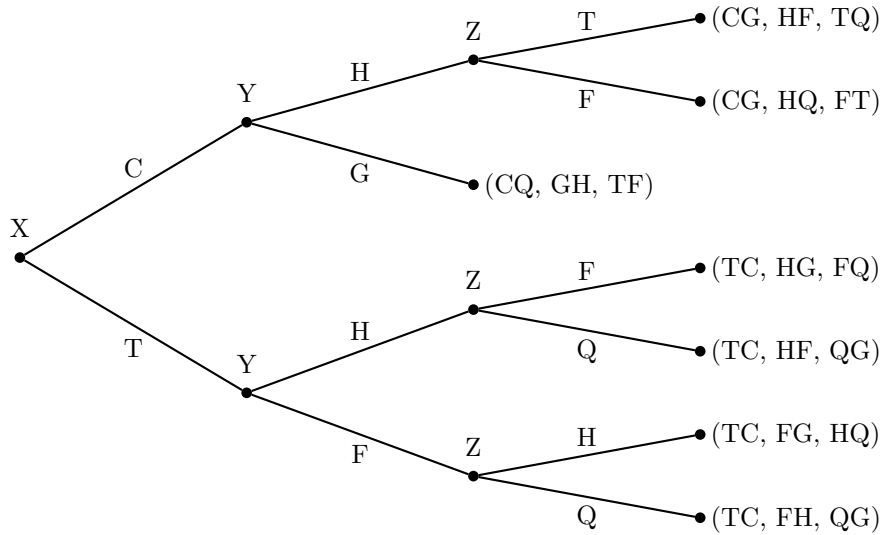


Figure 1: The draft game

The payoffs for this game are the players each team gets. For example, (CG, HQ, TF) indicates that team X gets the Center and the Guard (its #1 and #2 choices), team Y gets the Halfback and the Quarterback (#1 and #2), and team Z gets the Tailback and the Fullback (#1 and #4). Clearly each team would prefer to get the players it likes the most, e.g., team X prefers CT (or TC) to CQ or GQ.

1. The “naive” strategy is for each team to choose its top choice among the available players every time it gets to pick. What is the outcome of this strategy?
2. If teams X and Y pursue this naive strategy by picking C and H in the first round, should team Z also pursue this strategy, i.e., pick T? Briefly explain why or why not.
3. What outcome do you expect from this game using backward induction?
4. Is the expected outcome you identified Pareto efficient? If so, explain. If not, identify a Pareto improvement.
5. Statement 1: “In the first round, the optimal move for each team is to pick the best available player.” Statement 2: “In the second round, the optimal move for each team is to pick the best available player.” Explain why Statement 1 is false but Statement 2 is true.
6. *Super Challenge* Prove that the game tree really does boil down to what’s shown on the previous page.