

In Tennis Tournaments, typically there are 2^N players, numbered from 1 to 2^N . These players then play each other and move to the next stage or round. Player 1 plays against Player 2, Player 3 against Player 4 and so on. This order is preserved. In the next state, we end up with $2^{(N-1)}$ players and without destroying the order, the winner of Player 1-Player 2 match plays with the winner of Player 3-Player 4 match, and so on. This order is kept till the end or the last match of the championship. This is depicted in Figure 1.

Develop a data structure in order to keep track of the 1) matches played, 2) the players in a given stage, and 3) the players beaten.

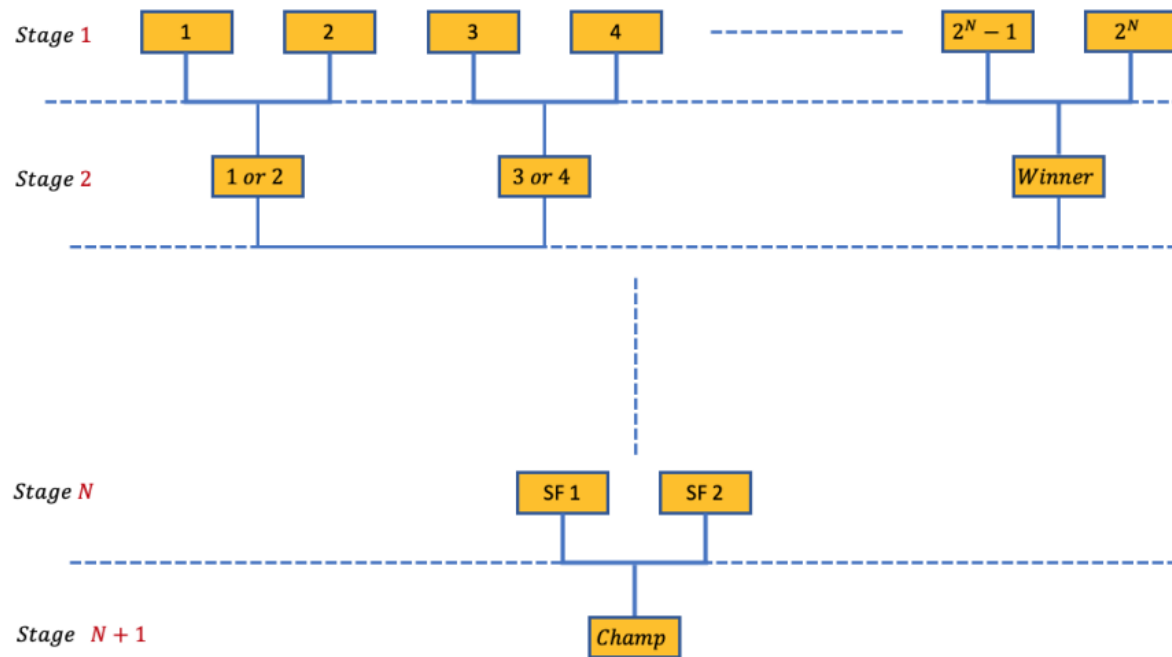


Figure 1: Fixture for Tennis Games in a given tournament.