

SOME PROFOUND THOUGHTS ABOUT THE CENTIPEDE GAME

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Player I and Player II are playing a game where Player I has the first move, and they later alternate moves until the end. In his first turn Player I has the option to quit the game assuring for himself 2 dollars and -1 dollars for Player II, or not quit. If he doesn't quit, then Player II has the option to quit right away, assuring 1 dollar for Player I and 2 dollars for herself, or to pass, giving Player I the next turn. Then Player I has the option to quit assuring 4 dollars for himself and 1 dollar for Player II or not quit, giving Player II the options of either giving 6 dollars to Player I and 3 dollars to herself or 3 dollars to Player I and 4 dollars to herself.

It is easy to see that if both players are "rational" (and they know it, and they know that they know it etc.) then Player I will quit after the first move. But this is a pity, since if they were a bit more irrational, and nicer, and trusting, they could have done much better for both of them if they played as long as possible, and Player II does not betray Player I at the very end.

This old chestnut from (standard) Game Theory raises some profound thoughts about the meaning of life, and more importantly, leads to intriguing new questions in the theory of Combinatorial Games.