

# Winning Strategies for Progressively Finite Games

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## Abstract

*Games are simple models of decision-making. Understanding games should help us understand decisions. Mathematical games provide opportunities for building self-concept and reducing the fear of failure and error. Progressively finite game is one of the mathematical games. This paper proposes the system which analyses the nature of progressively finite games such as the simple takeaway game and nim game by means of generating winning strategies. The system starts with the introduction of takeaway game, nim games and ends with producing their winning strategies. A winning strategy is a rule that tells the player which move to make the player will eventually win. Progressively finite games of winning strategies are based on the Grundy value. Grundy values 0 are in the winning strategy. The system uses the Digital Sum and Sprague-Grundy function of Combinatorial Game Theory to find Grundy value. Experimental results are show by means of probability theory as well as Bayes' rule.*