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Impartial Achievement and Avoidance Games on Finite Groups

In a 1987 paper, Anderson and Harary defined two impartial games with perfect information to be played on algebraic structures called finite groups. These games are played between two players who take turns selecting previously unselected element. In the game “DO GENERATE”, the player to choose an element which, along with the previously selected elements, generates the original group wins. In the game “DON’T GENERATE”, the player who must choose an element which generates the original group loses. We discuss how to determine who wins these games when played on a specific case of a finite group, called an Abelian group. We also consider a follow up paper by Ernst and Sieben detailing who wins these games in symmetric and alternating groups, as well as considering their values by comparing them to the game “Nim”.

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