

# A Journey through Zero-sum Theory

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Abstract : Zero-sum problems are basically combinatorial in nature. It deals with the condition that ensures that a given sequence over a finite group has a zero-sum subsequence with some prescribed properties. There are several group invariants associated with zero-sum problems such as the Davenport constant, the Erdős-Ginzburg-Ziv constant. We mainly focus on understanding the behaviour of these invariants for different finite group. The original motivation for introducing such group invariant was to study the problem of non-unique factorization domain over number fields. The precise value of such group invariants even for any finite abelian group are still unknown. In this talk, I will be focusing on zero-sum problems over in more generalized format i.e, by considering  $k$ -restricted sequences. Also, I will be introducing an extremal problem related to Davenport constant and its behaviour. Moreover, I will introduce the zero-sum invariants for random sequences, and will show how the behaviour of zero-sum invariants differs for usual sequences and random sequences.

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