## Choquet integral for finite sets: new expression, computation, and applications (a ChatGPT-driven experience)

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## Abstract

The Choquet integral was developed in 1954 by Gustave Choquet [3]. It was later applied in decision making under uncertainty since the pioneering work of Schmeidler [7], who proved its most popular characterization. However it was not used for multi-criteria decision aid (MCDA) till the decade of the 1990s [5]. Nowadays many generalizations exist [4], and the topic is the subject of intense research and development in many areas [1, 6].

In this paper we explore its utilization with finite sets, especially those of the form  $\{0, 1, 2, ..., N\}$ . We find a simple expression of the Choquet integral for this case. Then we show an implementation of this specific formula with Wolfram *Mathematica*. Finally, we produce applications to N-soft sets that include aggregation. Antecedents exist, since Yager's OWA operator [8] is a particular example of the Choquet integral, and it has been used to aggregate N-soft sets recently [2]. In addition to aggregation, the computation of scores of N-soft sets is another natural application of this restricted form of the Choquet integral.

An Appendix narrates my experience with ChatGPT as an assistant for this work.

## References

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