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"Um Estudo de Metaheurísticas Aplicadas ao Problema Job Shop Scheduling"

Job Shop scheduling is a NP-Hard problem of combinatorial optimization and one of the most well-known machine scheduling problems. In this a static model, a set of operations belonging to jobs, has to be processed on a set of machines, following some precedence constraints.

The goal of this work is to present new approaches using meta-heuristics to tackle the Job Shop Scheduling problem, and perform a comparative analysis of the performance of these meta-heuristics, emphasizing their similarities and peculiarities that arise when applied to this problems. To support this analysis, it was used a set of test instances taken from literature and carefully chosen for their level of difficulty.

In order to highlight the complexity related to tackling the Job Shop Scheduling problem with meta-heuristics, three Genetic Algorithms have been proposed and implemented. Comments regarding the difficulties handled in these algorithms to improve the results, and the necessary modifications, make clear not only the potential and the flexibility of techniques based on meta-heuristics, but also the limitations.

Finally, supported by the computational results, a detailed analysis of theperformance of the meta-heuristics and the algorithms presented in this work, in termsof their effectiveness and efficiency, introduce new ideas to guide better approaches to the Job Shop Scheduling problem.