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## Design and Comparison of Simulated Annealing Algorithm and GRASP to Minimize Makespan in Single Machine Scheduling with Unrelated Parallel Machines

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### ABSTRACT

This paper discusses design and comparison of Simulated Annealing Algorithm and Greedy Randomized Adaptive Search Procedure (GRASP) to minimize the makespan in scheduling n single operation independent jobs on m unrelated parallel machines. This problem of minimizing the makespan in single machine scheduling problem with uniform parallel machines is NP hard. Hence, heuristic development for such problem is highly inevitable. In this paper, two different Meta-heuristics to minimize the makespan of the assumed problem are designed and they are compared in terms of their solutions. In the first phase, the simulated annealing algorithm is presented and then GRASP (Greedy Randomized Adaptive Search procedure) is presented to minimize the makespan in the single machine scheduling problem with unrelated parallel machines. It is found that the simulated annealing algorithm performs better than GRASP.

### KEYWORDS

Makespan, Simulated Annealing Algorithm, GRASP, Unrelated Parallel Machines, Mathematical Model

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