Scheduling Unrelated Parallel Machines: Computational Results

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Abstract

Scheduling $n$ independent jobs on $m$ unrelated parallel machines without preemption belongs to the most difficult scheduling problems. Here, processing job $i$ on machine $j$ takes time $p_{ij}$, and the total time used by a machine is the sum of the processing times for the jobs assigned to it. The objective is to minimize makespan. In this paper we present a comparative study on selected algorithms and heuristics developed for this problem over the past decades. In the analysis we concentrate on the performance measures and the quality of solution. Our simulations show that for large and difficult test instances a combinatorial approach has a clear advantage over methods based on linear programming. It requires less operational memory, and thus is more effective and easier to handle. Furthermore, we observed that it possesses a natural behavior, i.e., it performs faster when the problem instance becomes easier to solve. This is not the case for the other approaches.

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