

Abstract

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Scheduling a single machine with job family setup times to minimize total tardiness

We study a single machine scheduling problem with sequence-dependent setup time to minimize total tardiness. The jobs are grouped by family. Processing jobs in the same family does not need set up otherwise there is a fixed amount of setup time between families. A family of jobs can be split. We present a heuristic procedure to solve this NP hard problem. The procedure generates a temporary schedule to estimate the impact of setup time on the performance, and then determines whether not a family splitting is necessary at the cost of additional setup time. The heuristic procedure is applied on a large set of test problems, and its performance is compared to that of the Apparent Tardiness Cost with Setup (ATCS) procedure, which is known for effectively minimizing the total tardiness of a schedule with setup time. Test results show that the proposed algorithm significantly reduces the tardiness.