

Single machine scheduling to minimize the setup time and the earliness

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Abstract

We consider the problem of scheduling customer orders on a single machine. It is assumed that each order consists of several jobs that can be clustered into several groups. A setup time is only required when processing switches from jobs of one group to jobs of another group. This problem is considered with the total setup time and the total earliness as measures of performance. A numerous of elimination properties are established, and a branch-and-bound algorithm is proposed to identify all feasible schedules for the bi-criteria problem.

Keywords : Setup time, earliness, single machine.

Introduction

In the traditional production process, most research assumes that the setup time is sequence independent and thus includes the setup time in the processing time. However, in many practical production environments, setup time may depend on the current job as well as the one last processed. Hence, there is still some research dealing with the sequence-dependent setup time. In particular, they consider the situation that jobs are classified into several groups, and a setup task is only

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Journal of Information & Optimization Sciences

Vol. 27 (2), No. 2, pp. 499–510

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0252-2667/06 \$2.00 + 0.25