A Mathematical Model for a Two-Stage Assembly Flow-Shop Scheduling Problem with Batch Delivery System

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Abstract : Manufacturers often dispatch jobs in batches to reduce delivery costs. However, sending several jobs in batches can have a negative effect on other scheduling-related objective functions such as minimizing the number of tardy jobs which is often used to rate managers' performance in many manufacturing environments. This paper aims to minimize the number of weighted tardy jobs and the sum of delivery costs of a two-stage assembly flow-shop problem in a batch delivery system. We present a mixed-integer linear programming (MILP) model to solve the problem. As this is an MILP model, the commercial solver (the CPLEX solver) is not guaranteed to find the optimal solution for large-size problems at a reasonable amount of time. We present several numerical examples to confirm the accuracy of the model.
Keywords : scheduling, two-stage assembly flow-shop, tardy jobs, batched delivery system
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