## A Dynamic Programming Algorithm For Days-Off Scheduling With Sequence

## **Dependent Labor Costs**

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## **Summary**

This paper presents a dynamic programming (DP) algorithm for solving a labor scheduling problem with several realistic days-off scheduling constraints and a cost structure that depends on the work sequence for each employee. The days-off scheduling constraints include the following: (1) each employee is assigned no more than three workdays per week, (2) each employee is assigned at least two consecutive off days per week, and (3) any work stretch cannot exceed four consecutive workdays. The sequence-dependent cost structure assumes that the daily wage of each employee depends on two factors: (1) whether the given workday is weekend or a regular workday, and (2) the sequence of work patterns assigned in previous days. A DP algorithm suited to instances of moderate size is used to determine the optimum work assignments that minimize the total labor cost, while satisfying the work demand under the stated constraints.

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