Design Analysis and Algorithms Project

Project Title:

A dynamic programming approach for storage location assignment planning problem

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Abstract:

Online retailers usually provide fast product delivery service to attract consumers and in consequence boost their sales, which enforces warehouses or distribution centers to fulfill customer orders within tight time windows.

This project presents a novel approach to improve the order-picking operation which is the most time- and labor-intensive activity in the process of order fulfillment. We are motivated by the fact that many product demands fluctuate over time and it would be benefic to update storage location assignment in time to reassign the most popular products in each period to storage locations nearest to the depot. We formulate the problem as an integer programming and develop a dynamic programming approach to solve it. To evaluate the proposed method, a computational experiment is conducted and the results are reported.

**Research paper:** <https://www.sciencedirect.com/science/article/pii/S2212827119307279>

**Keywords:** Order-picking, Storage location reassignment, Dynamic programming