Heuristics for the multi row facility layout problem considering facilities of equal length

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Abstract

The Multi Row Facility Layout Problem considering facilities of equal length (MREFLP) is a particular case of the family of Floor Layout Problems. The most generic problem is Multi Row Facility Layout Problem, and the difference between them is that in the first one, it can be assumed that the facilities have the same width. The best-known is the Corridor Allocation Problem (also called Space-Free Double Row Facility Layout Problem), which is a particular case of this one, considering only two rows, and with no space between the facilities. The objective is minimising the cost obtained as the product between the distance of each pair of facilities and the associated weight of the same pair of facilities. The result is n facilities in m rows. There are several applications of this problem, most of them related to industry like assembly lines, chip design, manufacturing systems, arrangement of facilities and so on. This problem has been studied in the past with exact approaches. These exact approaches perform better in the case where the number of facilities is lower or equal to 20. For grater values, it cannot reach the optimal value in their time limit. Also, the smallest the m, the better the results. We propose a new heuristic approach for this problem where we have obtained promising results in comparison with the state of the art.

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