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The resource renting problem subject to temporal constraints. (English) Zbl 0985.90041

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Summary: We introduce a project scheduling problem subject to temporal constraints where the resource availability costs have to be minimized. As an extension of known project scheduling problems which consider only time-independent costs, this problem includes both time-independent procurement costs and time-dependent renting costs for the resources. Consequently, in addition to projects where all resources are bought, we can deal with projects where resources are rented. Based on the enumeration of a finite set of schedules which is proved to contain an optimal schedule, we develop a depth-first branch-and-bound procedure. Computational experience with a randomly generated test set containing 10800 problem instances is reported.

MSC:

90B35 Deterministic scheduling theory in operations research
90C57 Polyhedral combinatorics, branch-and-bound, branch-and-cut

Keywords:

project scheduling; temporal constraints; resource costs; branch-and-bound

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