A hybrid adaptive large neighborhood search heuristic for lot-sizing with setup times - DTU Orbit (11/01/2019)

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This paper presents a hybrid of a general heuristic framework and a general purpose mixed-integer programming (MIP) solver. The framework is based on local search and an adaptive procedure which chooses between a set of large neighborhoods to be searched. A mixed integer programming solver and its built-in feasibility heuristics is used to search a neighborhood for improving solutions. The general reoptimization approach used for repairing solutions is specifically suited for combinatorial problems where it may be hard to otherwise design suitable repair neighborhoods. The hybrid heuristic framework is applied to the multi-item capacitated lot sizing problem with setup times, where experiments have been conducted on a series of instances from the literature and a newly generated extension of these. On average the presented heuristic outperforms the best heuristics from the literature, and the upper bounds found by the commercial MIP solver ILOG CPLEX using state-of-the-art MIP formulations. Furthermore, we improve the best known solutions on 60 out of 100 and improve the lower bound on all 100 instances from the literature

General information
State: Published
Organisations: Department of Management Engineering, Management Science
Contributors: Muller, L. F., Spoorendonk, S., Pisinger, D.
Pages: 614-623
Publication date: 2012
Peer-reviewed: Yes

Publication information
Journal: European Journal of Operational Research
Volume: 218
Issue number: 3
ISSN (Print): 0377-2217
Ratings:
Web of Science (2019): Indexed yes
BFI (2018): BFI-level 1
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
Scopus rating (2017): CiteScore 4.08 SJR 2.437 SNIP 2.375
Web of Science (2017): Impact factor 3.428
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 3.83 SJR 2.489 SNIP 2.433
Web of Science (2016): Impact factor 3.297
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): CiteScore 3.59 SJR 2.225 SNIP 2.364
Web of Science (2015): Impact factor 2.679
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): CiteScore 3.21 SJR 2.143 SNIP 2.444
Web of Science (2014): Impact factor 2.358
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): CiteScore 3.25 SJR 2.238 SNIP 2.691
Web of Science (2013): Impact factor 1.843
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): CiteScore 3.01 SJR 2.326 SNIP 2.567
Web of Science (2012): Impact factor 2.038
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 1