

# An Exact Algorithm for IP Column Generation

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## Abstract

An exact column generation algorithm for integer programs with a large (implicit) number of columns is presented. The family of problems that can be treated includes not only standard partitioning problems such as bin packing and certain vehicle routing problems in which the columns generated have 0 – 1 components and a right hand side vector of 1's, but also the cutting stock problem in which the columns and right hand side are nonnegative integer vectors. We develop a combined branching and subproblem modification scheme that generalizes existing approaches, and also describe the use of lower bounds to reduce tailing-off effects.

Keywords: Integer Programming, Column Generation

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