JOBSHOP SCHEDULING PROBLEM
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Overview
The jobshop scheduling belongs to the category of a combinatorial and NP-Hard optimization problem. The idea behind this type of problem is the allocation of several task having limited resources for them. There are many variations of it related to the task and the resources. Task may have constraints among them, for example a certain task i must be processed before another j, or tasks and resources may have constraints, i.e., some task must be assigned to some resources only. Resources must be related or independent each other, resources must require a gap between tasks and/or may have sequence dependent setup times. Several objective functions can be defined: makespan minimization, profit maximization, cost minimization, etc.

For this particular case, there are several jobs (task) that must be allocated in a sequence of stages (resources) where not all jobs requires all the stages, just a subset of those (Raman and Grossmann, 1994). Zero wait transfer is assumed between task, and the objective function is the minimization of the completion time.

We present a disjunctive model which is solved with EMP and automatically reformulated as MILP by means of the Big-M or convex hull relaxations.

References