

Discrete Optimisation

Exercise Session 3: Branch-and-bound

October 2, 2015

- Exercise 1** (branch-and-bound implementation). 1. Develop a MILP model for the knapsack problem.
2. Implement an algorithm that solves to optimality instances of this problem by pure enumeration of all solutions.
 3. Implement a branch-and-bound that solves to optimality instances of this problem.
 4. Compare both approaches, in terms of worst case and average case time complexity.

Exercise 2 (branch-and-bound worst case time complexity). Show by an example that the branch and bound algorithm may have an exponential complexity in the size of the input space.

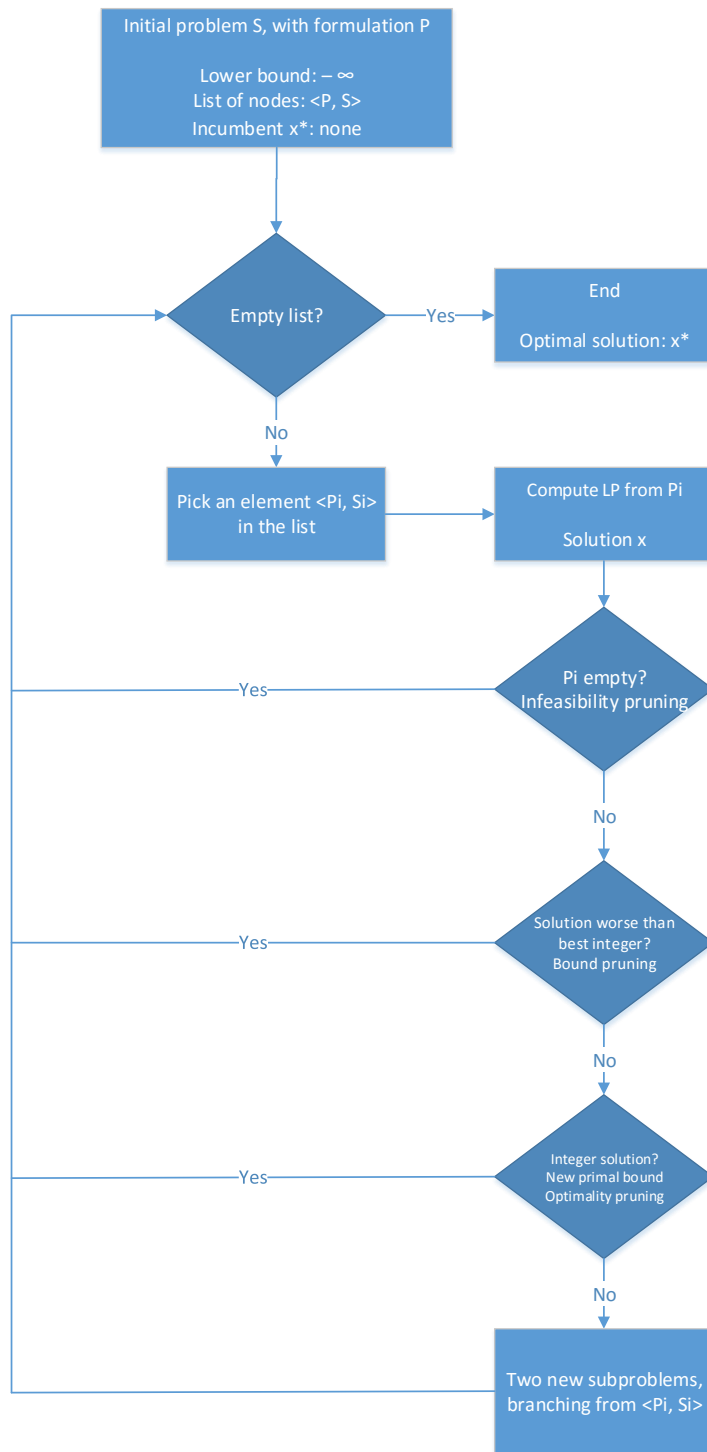


Figure 1: Branch-and-bound algorithm for minimisation.