

Decision-Aid Methodologies in Transportation

Optimization Exercise 3

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Agenda

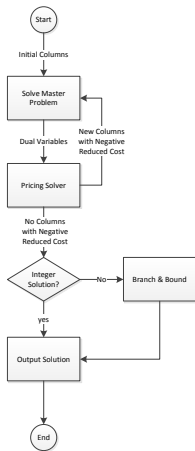
- 1 Branch and Price
- 2 OPL Functions

1 Branch and Price

- Master Problem
- Initial Solution
- Sub-Problem

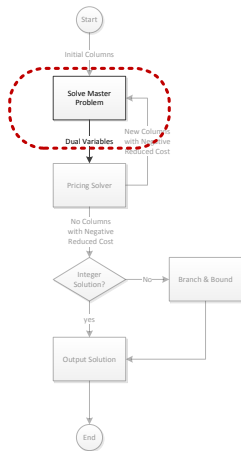
2 OPL Functions

Branch and Price



- Initial Solution
- Column Generation – Lower Bound
- Branch and Bound – Optimal Integer Solution

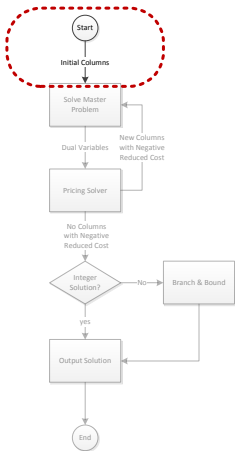
Master Problem



Idea

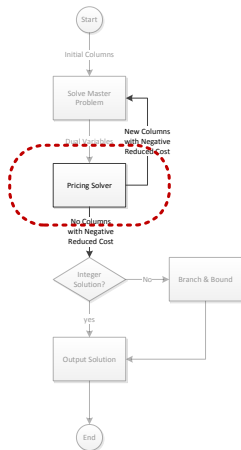
- Cutting Stock Problem
- relaxation of decision variables
- solution space significantly reduced, e.g. faster to solve

Initial Solution



- has to be feasible!
- in your case already given

Sub-Problem



Idea

- generate better columns based on the reduced cost
- need of dual variables
- finish, when no negative reduced cost columns

1 Branch and Price

2 OPL Functions

- in the master problem use float decision variable(s); duals do not exist for integers
- duals are per constraint, e.g.:
- forall(i in Items)
 duals:
 x[i] <= 5;
- to get the dual value then:
- duals[i].dual
- you can use the execute function to print the values in scripting log
- no need for general code, solve it manually and copy paste the values
- don't forget to increase the size of the range **columns** after each iteration!
- use one project with 2 configurations