TRANSP-OR

Introduction
à l'optimisation
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Optimisation en nombres entiers

Question 1:

1. In this problem nodes 3,7,5,6 are active and between these nodes node 5 has the minimum value (27) Upper bound is the best feasible solution (31). The solution is in the range [27,31]

2. Nodes 6,7,8 are pruned Nodes 3,5 should be explored

Question 2:

The solution of relaxation problem is $(16/3)$ with $(4/3, 4/3)$

The integer solution is $(1,3/2)$ whose objective function is $(11/2)$

Question 3:

1)
$p \in P$:{Carl,Chris,David,Tony,Ken}
$s \in S$:{Backstroke,Breaststroke,Butterfly,Freestyle}
$T_{p,s}$: Best time of stroke s for swimmer p
$x_{p,s}$: Binary variable, if persone p is assigned to stroke s

$$\sum_{s \in S} \sum_{p \in P} T_{p,s} x_{p,s} \tag{1}$$

$$\sum_{p \in P} x_{p,s} = 1 \quad \forall s \in S \tag{2}$$

$$\sum_{s \in S} x_{p,s} \leq 1 \quad \forall p \in P \tag{3}$$

2)
In order to transform it to the assignment problem we chage the set S in the following manner:
$s \in S$:{Backstroke, Breaststroke, Butterfly, Freestyle, Dummy}

$$\sum_{s \in S} \sum_{p \in P} T_{p,s} x_{p,s} \tag{4}$$

$$\sum_{p \in P} x_{p,s} = 1 \quad \forall s \in S \tag{5}$$

$$\sum_{s \in S} x_{p,s} = 1 \quad \forall p \in P \tag{6}$$

3)
Optimal solution is 126.2. David is assigned to backstroke. Tony to breaststroke. Chris to butterfly and Carl o freestyle.