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6 / 8 76%

Tools Comment

Formalism

- w_i - wins for team i
- g_i - games left for team i
- g_{ij} - games left between i and j

For any subset R of teams T :

- wins in R , $w(R) = \sum_{i \in R} w_i$
- games left in R , $g(R) = \sum_{i, j \in R, i < j} g_{ij}$

games

A lower bound on a number of teams that some team must win

$$a(R) = \frac{w(R) + g(R)}{|R|}$$

Claim: For $i \in T$, $R \subseteq T - \{i\}$, and $a(R) > w_i + g_i$, then i is eliminated.

Justification: Some team must win the average.

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5 / 8 76%

Tools Comment

Baseball Elimination

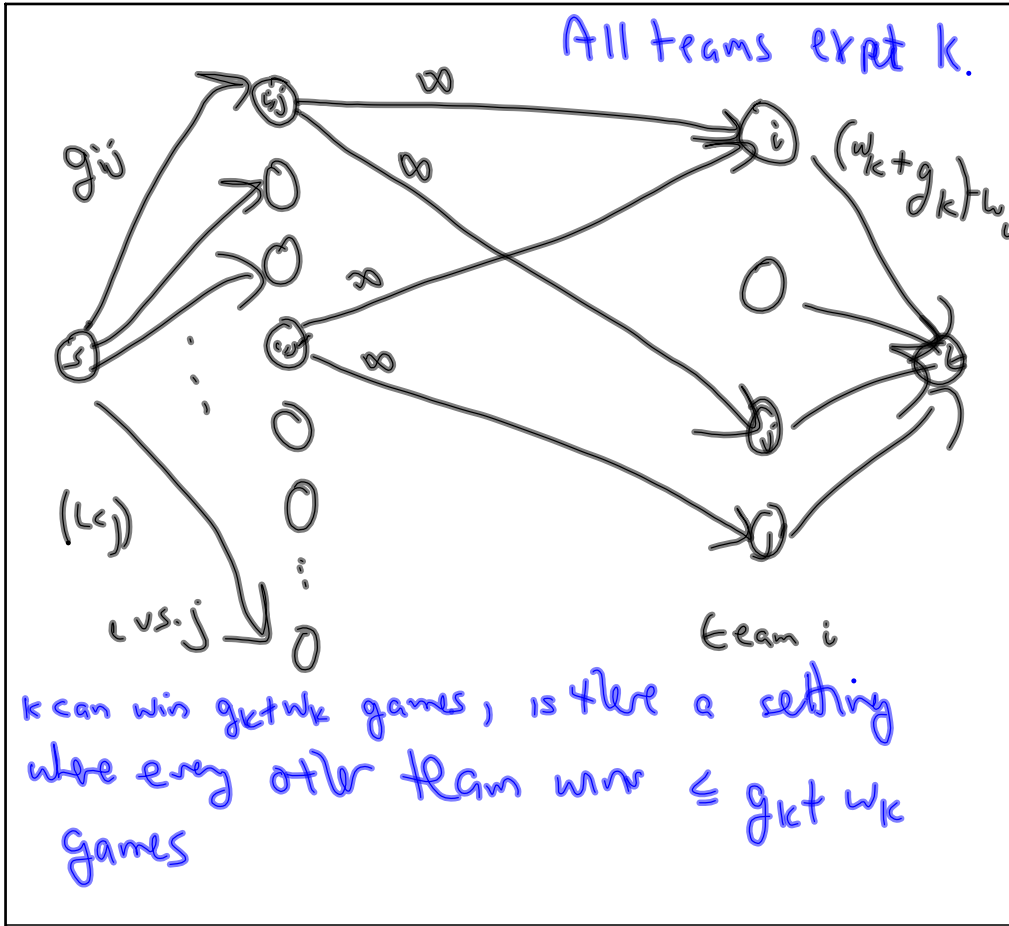
(SportsWriters end of Season Problem)

Team	Wins w_i	Games left g_i	Games against g_{ij}			
			NY	Bos	Tor	Bal
NY Yankees	93	8	-	1	6	1
Boston Red Sox	89	4	1	-	0	3
Toronto Blue Jays	88	7	6	0	-	1
Baltimore Orioles	86	5	1	3	1	-

Question: Which teams are eliminated and which are not?

$$\frac{93 + 88 + 6}{2} = 93 \frac{1}{2} > 93$$

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Mar 8-11:14 AM

If no flow of val. $\sum_{i < j} g_{ij}$ exist \Rightarrow team k is eliminated.

PF

- (s, V-s) is not the min cut.
- some of the "par" nodes are on the s side of the min cut
- if node (Lj) is on the s side then node i & node j are also on the s side. (no ∞ cap edges can cross cut)

Mar 8-11:24 AM

$$c(S, \bar{S}) = \sum_{(i,j) \in S} g_{ij} + \sum_{k \in R} w_k + g_k - w_i$$

$$= \left(\sum_{(i,j) \in S} g_{ij} + |R| (w_k + g_k) - w(R) \right)$$

$$\sum_{(i,j) \in S} g_{ij} >$$

$$\sum_{(i,j) \in S} g_{ij} > |R| (w_k + g_k) - w(R)$$

$$\sum_{(i,j) \in S} g_{ij} = g(R)$$

$$g(R) > |R| (w_k + g_k) - w(R)$$

$$w_k + g_k < \frac{g(R) + w(R)}{|R|}$$

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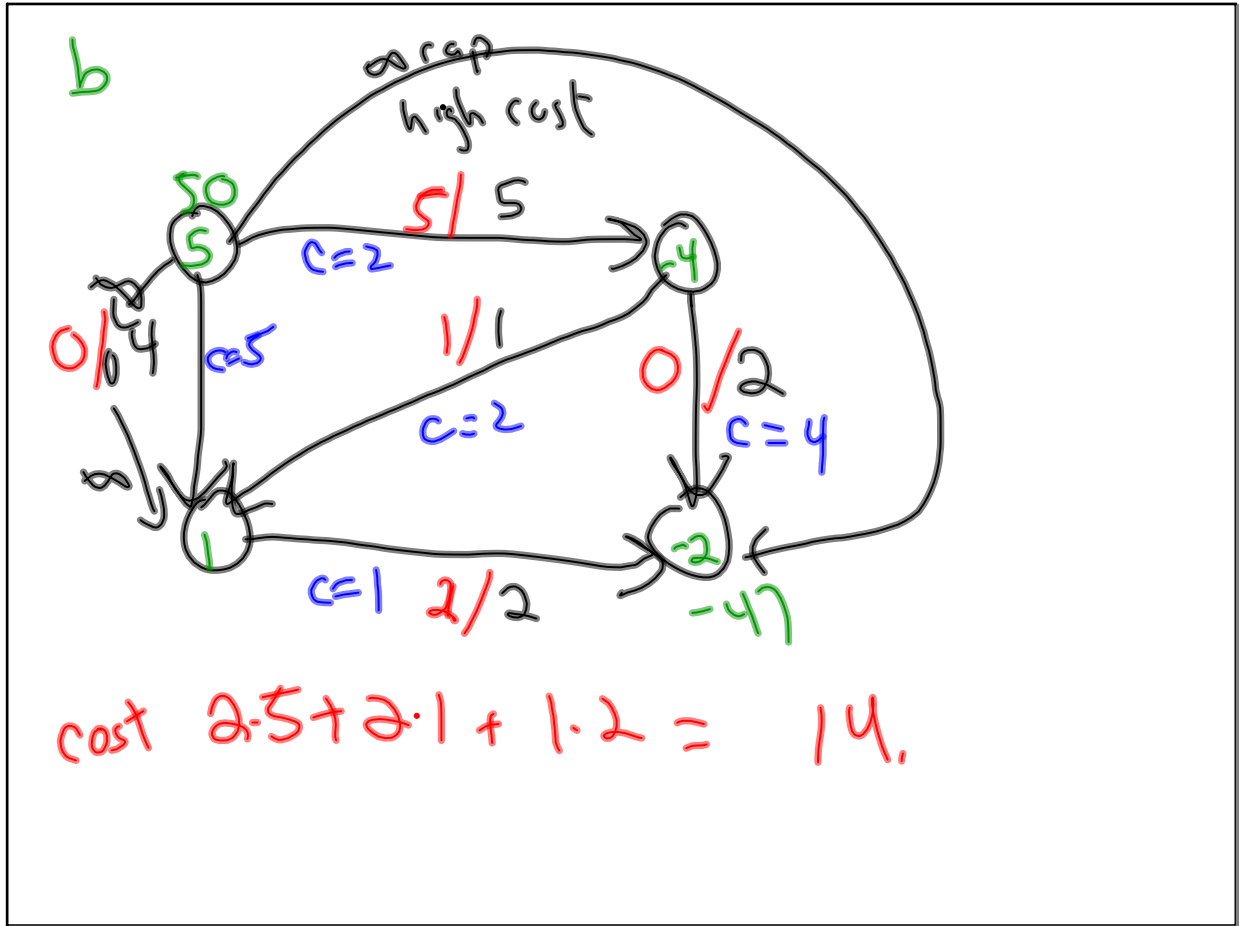
$$3(5) + 3(1) + 3(4) = 30$$

$$2(5) + 2(1) + 1(1) + 1(2) + 3(3) = 22$$

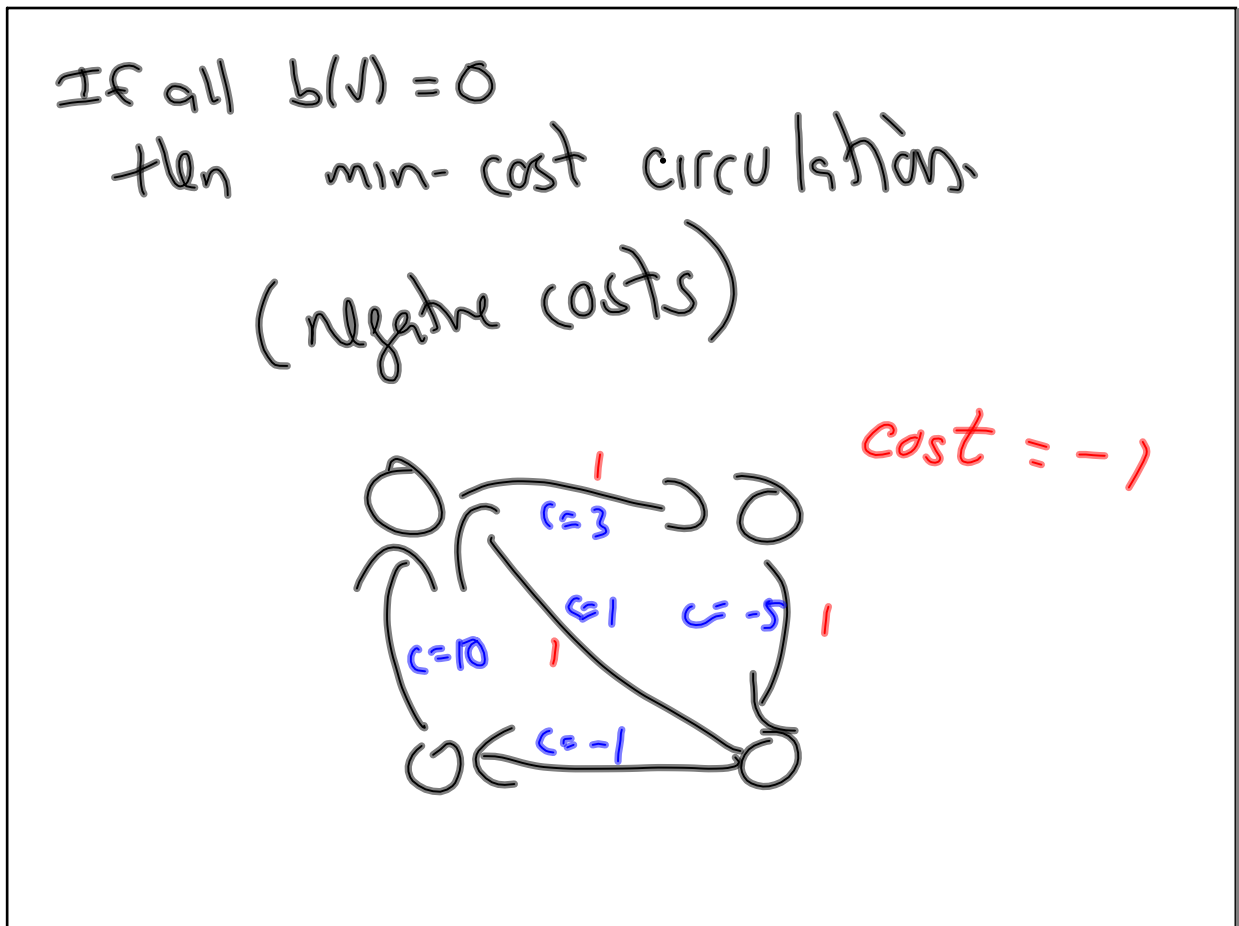
$$1(5) + 1(1) + 2(1) + 1(2) + 3(3) = 24$$

3 units on top
 2 on top
 1 on bottom
 1 on top
 2 on bottom

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Mar 8-12:04 PM



Mar 8-12:09 PM