

# Quiz 8

MAT 332  
Fall 2022

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First

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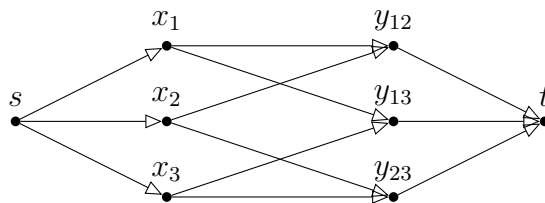
Last

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Consider a local baseball league with four teams  $x_0, x_1, x_2, x_3$ . You are rooting for the team  $x_0$  and, at some time during the season, you are wondering if  $x_0$  can still win the championship. Each pair of teams play 10 games during the season. The table below shows the results so far; the entry in row  $x_i$  and column  $x_j$  is the number of times the team  $x_i$  has defeated the team  $x_j$  so far (there are no draws).

	$x_0$	$x_1$	$x_2$	$x_3$
$x_0$	-	6	4	3
$x_1$	3	-	3	8
$x_2$	5	2	-	7
$x_3$	5	1	2	-



- If  $x_0$  wins all its remaining games, how many wins will it have altogether?
- Assuming  $x_0$  does win all its remaining games, how many more games can each of  $x_1, x_2$  and  $x_3$  win so that  $x_0$  is the sole champion (has more wins than every other team)?
- How many more times will  $x_i$  play  $x_j$ , for  $1 \leq i < j \leq 3$ ?
- Create a model for this problem by assigning capacities to the above network. What should the value of max flow be so that  $x_0$  has a chance to be the champion?
- Find the minimum cut for the model network you have created. What conclusion can you make from value of the min cut?