

Task Discussion

Kingdom Defence

Daniel Graf
based on the slides by Rastó Šrámek

ETH Zürich

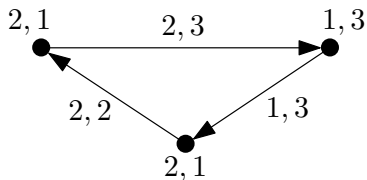
November 11, 2015

Kingdom Defense

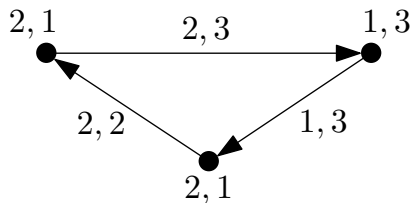
Graph with:

- Maximum **and** minimum edge capacities
- Starting and minimum ending vertex “budget”

Question: Is it possible to satisfy all the requirements?



Kingdom Defense



Is this a flow problem? **No.**

Does it look like a flow problem? **A little bit.**

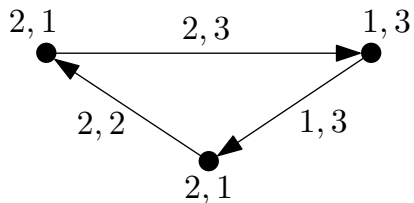
Can it be turned into a flow problem? **Maybe.**

Suppose we can set minimum edge capacities.

Does it look like a circulation problem? **Yes.**

If there is a satisfying flow, there is satisfying soldier movement.

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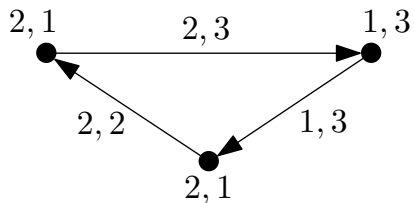
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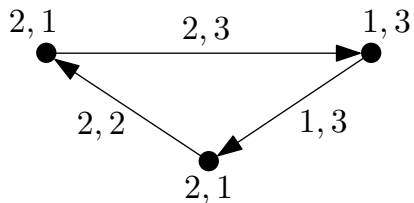
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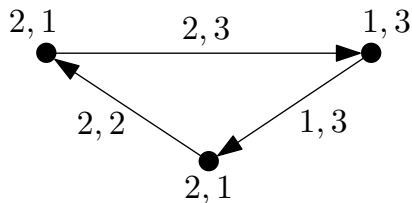
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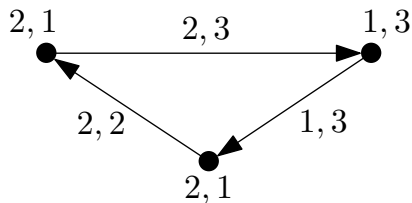
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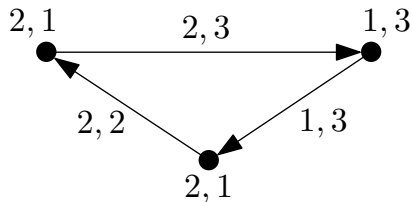
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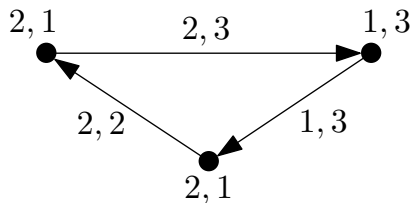
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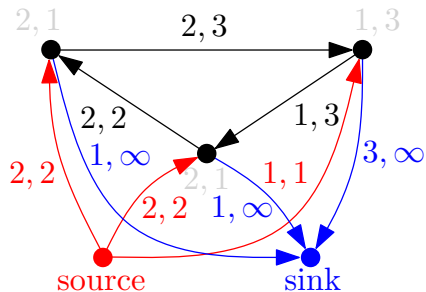
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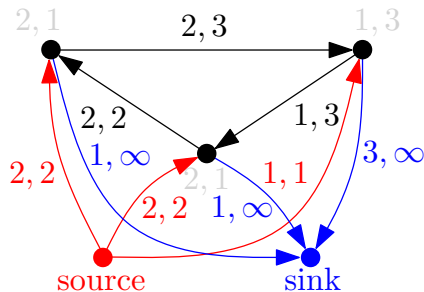
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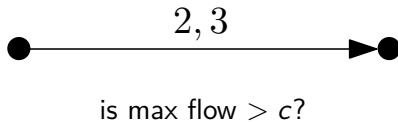
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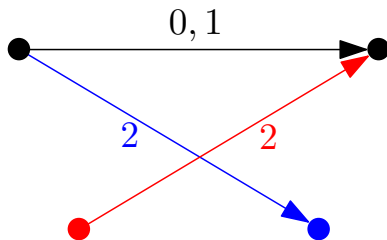
Minimal Capacities

How to enforce minimal edge capacities?



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How to enforce minimal edge capacities?



is $\text{max flow} > c + 2$?

Kingdom Defense

- Count in/out-flow to each vertex, aggregate flows for checking
- Remove minimum flow limits, add to aggregate
- Check if max flow is sufficiently large