Popular matchings

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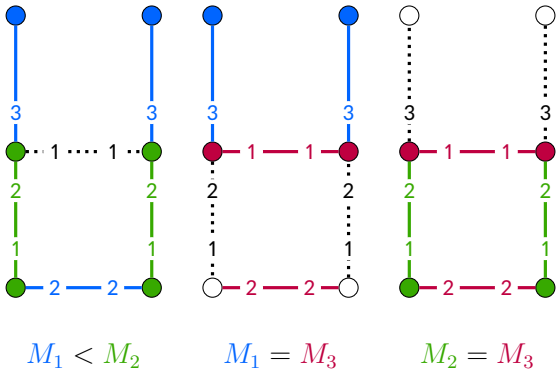
A voting-based optimality concept for matchings under preferences.

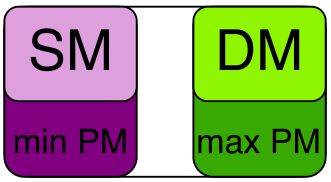


Each vertex casts a vote when comparing two matchings. The one with more votes is *more popular*.

Popular matching It doesn't get defeated by any matching.[4]

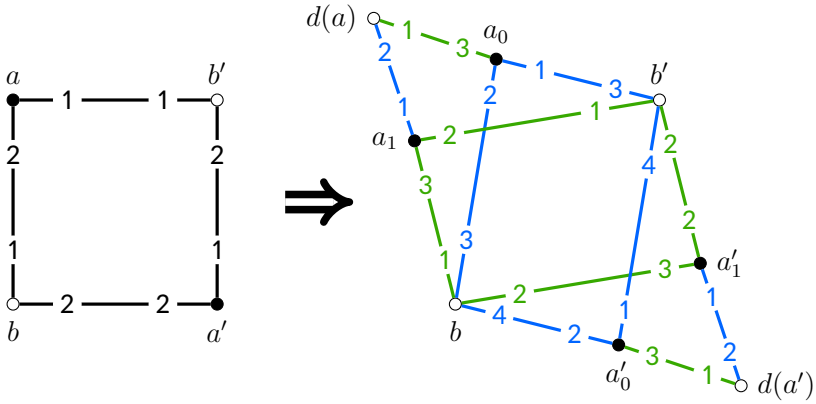
Dominant matching It doesn't get defeated by any matching and it strictly defeats every larger matching.[2]

Stable matching It doesn't get defeated by any matching and it strictly defeats every smaller matching.[1, 2]
No pair is inclined to run off together.[3]



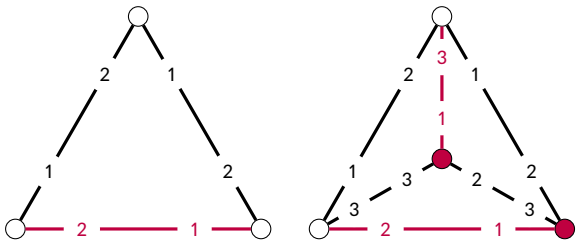
Our results

- new definition of stable matchings
- dominant matchings = stable matchings in a transformed instance!



Open questions

- How to find a popular matching that is not stable and not dominant?
- LP description for the popular matching polytope
- Popular matchings in non-bipartite instances



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[1] P. Biró, R. W. Irving, and D. F. Manlove. Popular matchings in the marriage and roommates problems. In *Proceedings of CIAC '10: the 7th International Conference on Algorithms and Complexity*, volume 6078 of *Lecture Notes in Computer Science*, pages 97–108. Springer, 2010.

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[3] D. Gale and L. S. Shapley. College admissions and the stability of marriage. *American Mathematical Monthly*, 69:9–15, 1962.

[4] P. Gärdenfors. Match making: assignments based on bilateral preferences. *Behavioural Science*, 20:166–173, 1975.