Erratum: The Rankability of Data[*]

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Abstract. This erratum contains corrected figures to replace Figures 5, 7, and 9 in [P. Anderson, T. Chartier, and A. Langville, *The rankability of data,* SIAM J. Math. Data Sci., 1 (2019), pp. 121–143].

Key words. ranking, rankability, linear program, integer program, combinatorial optimization, relaxation

AMS subject classifications. 90C08, 90C10, 52B12, 90C35

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This erratum contains corrected figures to replace Figures 5, 7, and 9 in [1]. We discovered an error in the graph entitled "Random Graph," which was a running example used in Figures 5, 7, and 9. Specifically, the pictorial representation of the graph was not consistent with the adjacency matrix ($\mathbf{D}$) used to generate the P set and further results shown in Figures 7 and 9. We have replaced the pictorial representations of the graph in Figures 5, 7, and 9 with the correct representation.

This error pertains only to the pictorial representations of the graph of these figures and does not affect the original paper's text, results, and conclusions. The reader can now correctly replicate the results of the running example of these three figures.
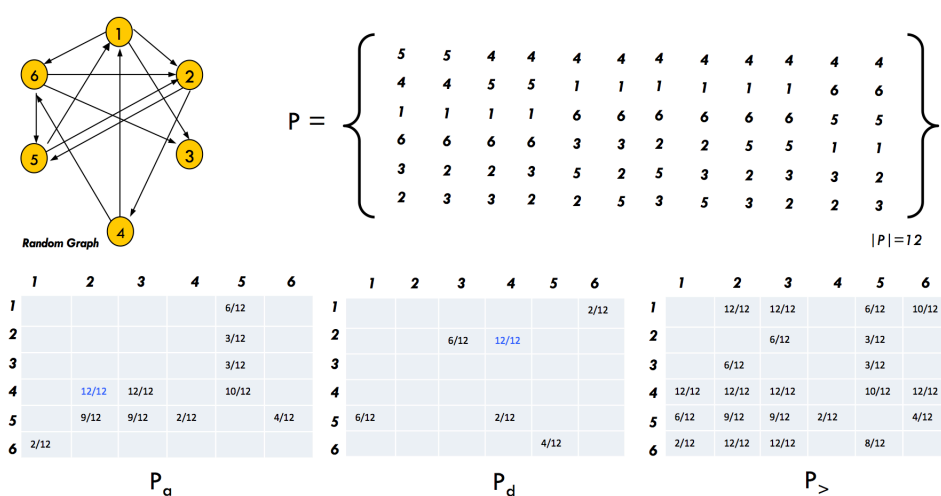
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Figure 5. *Random graph with full P set and three matrices, $\mathbf{P}_a$, $\mathbf{P}_d$, and $\mathbf{P}_>$, built from P. Each column in P is a ranking. The matrices $\mathbf{P}_a$, $\mathbf{P}_d$, and $\mathbf{P}_>$ summarize information, respectively, about adding links, deleting links, and using dominance relations. Note that $P_a(4,2) = 12/12$ and $P_d(2,4) = 12/12$, which means that all 12 rankings suggest adding a link from 4 to 2 and removing the link from 2 to 4. Thus, the existing link from 2 to 4 may be noise.*
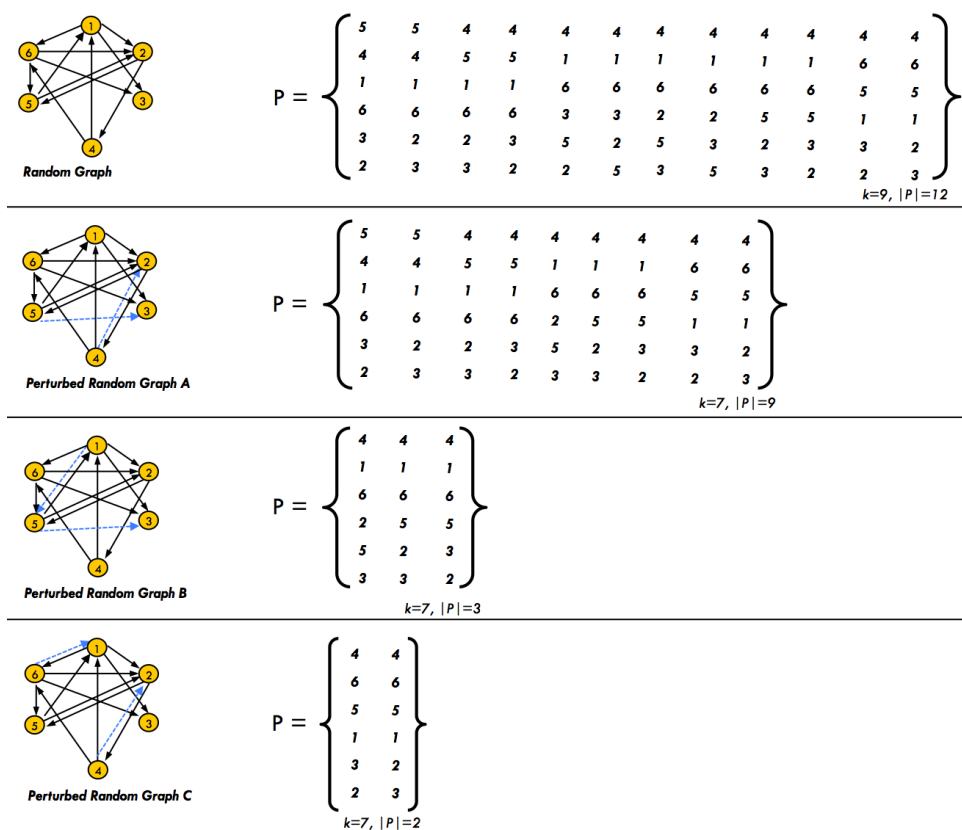
Figure 7. *Improving a graph's rankability with link perturbations. The $n = 6$ example graph at the top, which is a random graph, is perturbed three different times, each time by making two link perturbations, which are indicated by dashed lines. The link perturbations are made according to the heuristics described above. The rankability measure improves from graph A to B to C since the value of k reduces from 9 to 7 and the size of the P set successively shrinks.*
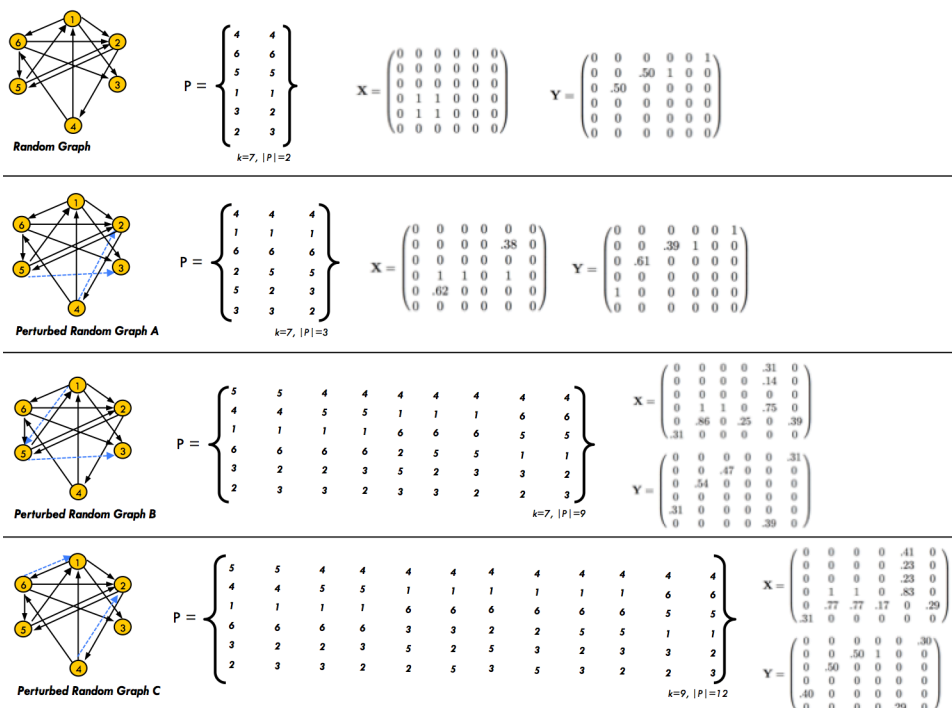
Figure 9. *LP outputs matrices* $\mathbf{X}$ *and* $\mathbf{Y}$*. The location of fractional elements in these matrices gives information about the set P without the expense of actually forming the full P, thus creating great computational savings.*

REFERENCE

[1] P. ANDERSON, T. CHARTIER, AND A. LANGVILLE, *The rankability of data,* SIAM J. Math. Data Sci., 1 (2019), pp. 121–143, https://doi.org/10.1137/18M1183595.