On the Number of Linear Extensions of Graphs

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Given a bipartite graph, let us pick an acyclic orientation of its edges. Then, if we consider the partially ordered set (poset) induced by this orientation, the number of linear extensions of such a poset is maximal whenever the orientation is bipartite, or such that no directed path of length two exists. We define a sequence of automorphisms that injectively but non-bijectively map the set of linear extensions of a nonbipartite orientation to the set of linear extensions of a bipartite orientation. Additionally, we define such a sequence for simple odd cycle graphs and discuss extending mappings to apply to general nonbipartite graphs.

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