

The distance between two strict weak orders

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Consider two strict weak orders (that is irreflexive, transitive, non-total relations) on the same finite set. How similar are the two? This question is motivated by the statistical question of association between two rankings which contain ties. In order to assess the similarity of the orders I will present an approach where the lack of agreement is assessed by counting the number of certain operations that are needed to transform one weak order into the other. The resulting measure is a symmetric and positive definite function but does not satisfy the triangle inequality. Hence, technically, it is a distance but not a metric. So far the proposed distance can only be computed recursively. Input from the audience which would help me to derive a closed form solution and pointers to related 'pure' literature I am not aware of will be greatly appreciated.