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Intersections of Finite Sets: Geometry and Topology

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Given a collection of finite sets, Kneser-type problems aim to partition this collection into parts with a well-understood intersection pattern, such as that in each part any two sets intersect. Since Lovász' solution of Kneser's conjecture concerning intersections of all k-subsets of an n-set, topological methods have been a central tool in understanding intersection patterns of finite sets. We will develop a method that in addition to using topological machinery takes the topology of the collection of finite sets into account via a translation to a problem in Euclidean geometry. This leads to simple proofs of old and new results.
