On the Shellability of Ranked Lattice

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A well-known class of simplicial complexes are the simplicial complexes of independent spaces of a matroids. Being shellable, their homology groups are well understood. When one replaces the notion of sets by the notion of subspaces, the matroids are replaced by q-matroids. In a similar fashion, simplicial complexes are replaced by q-complexes. Analogously to the case of matroids, independent spaces of a q-matroid define a q-complex. Recently, the q-complexes coming from q-matroids were shown to be (q-)shellable. This property again helps us in many cases to compute the homology groups of the q-complexes. Having these results in mind, we further expand the notion of (q-)shellability to ranked lattice expecting that this also helps to compute the homology groups of some some finite topological spaces associated to lattices.

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