

A simplicial complex is d -representable if it is the nerve of a collection of convex sets in \mathbb{R}^d . Classical Helly's Theorem states that if a d -representable complex contains all the possible faces of dimension d then it is already a full simplex. Helly's Theorem has many extensions and we give a brief survey of some of them. The class of d -representable complexes is a subclass of d -collapsible complexes, and the latter is a subclass of d -Leray complexes. For $d = 1$ we give an example of complexes that are $2d$ -Leray but not $(3d - 1)$ -collapsible. For $d = 2$ we give an example of complexes that are d -Leray but not $(2d - 2)$ -representable. We show that for $d = 3$ the complexes from the last example are also d -collapsible. We also give a simple proof of the Combinatorial Alexander Duality, which is a useful topological tool for combinatorics, e.g., for topological versions of Helly's Theorem.