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Authors:	Pallavi (/jspui/browse?type=author&value=Pallavi)
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Abstract:	This thesis provides a systematic exposition of the theory of incidence algebras and Mobius functions. So, for the initial preliminary work, partially ordered sets, lattices and their types are studied. The central theme revolves around the fundamental work of Gian-Carlo Rota on Mobius function of partially ordered sets. We see that the Mobius function can be expressed as reduced Euler characteristic of the order complex of a partially ordered set and since Euler characteristic is a topological invariant, so turns out the Mobius function on a poset. Furthermore, this Mobius function on a poset is just the classical number-theoretic Mobius function whose inverse is the zeta function in incidence algebra. Mobius inversion theory also setups a generalization of the Principle of Inclusion-Exclusion and establishes an analogue of the \fundamental theorem of calculus." Finally, applications of Mobius functions have been examined, starting with the result by Rota that expresses the chromatic polynomial of a graph in terms of Mobius function of a poset and closing by zeta polynomial of a partially ordered set.
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