

Semirings of Graphs: An Approach Towards the Algebra of Graphs

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Abstract : Graphs are found to be most capable in computing, and its abstract structures have been applied in some specific computations and algorithms like in phase encoding controller, processor microcontroller, and synthesis of a CMOS switching network, etc. Being motivated by these works, we develop an independent approach to study semiring structures and various properties by defining the binary operations which in fact, seems analogous to an existing definition in some sense but with a different approach. This work emphasizes specifically on the construction of semigroup and semiring structures on the set of undirected graphs, and their properties are investigated therein. It is expected that the investigation done here may have some interesting applications in theoretical computer science, networking and decision making, and also on joining of two network systems.

Keywords : graphs, join and union of graphs, semiring, weighted graphs

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