

A study of Boolean matrix algebra

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We shall characterize regular Boolean matrices and multidimensional regular Boolean matrices. We have some Boolean matrix algebra. Then we develop generalized doubly stochastic square matrices motivated by Boolean matrix algebra.

The set of all doubly stochastic matrices does not make an algebra by the usual matrix sum and product. But by introducing a new operation, we make the set of all doubly stochastic matrices into a semiring.

Among others, we shall prove a limit theorem for a doubly stochastic matrix. There are considerable new results.

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