

## Convergence of Generalized Jacobi, Gauss-Seidel and Successive Overrelaxation Methods for Various Classes of Matrices

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**Abstract :** Generalized Jacobi (GJ) and Generalized Gauss-Seidel (GGS) methods are most effective than conventional Jacobi and Gauss-Seidel methods for solving linear system of equations. It is known that GJ and GGS methods converge for strictly diagonally dominant (SDD) and for M-matrices. In this paper, we study the convergence of GJ and GGS converge for symmetric positive definite (SPD) matrices, L-matrices and H-matrices. We introduce a generalization of successive overrelaxation (SOR) method for solving linear systems and discuss its convergence for the classes of SDD matrices, SPD matrices, M-matrices, L-matrices and for H-matrices. Advantages of generalized SOR method are established through numerical experiments over GJ, GGS, and SOR methods.

**Keywords :** convergence, Gauss-Seidel, iterative method, Jacobi, SOR

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