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Abstract

Understanding the way modern computer operate to solve complex problems, is a skill any well versed engineer should be acquainted with. Specifically looking as to how to solve linear systems of equations on a computer is a topic of great interest, given that many systems which engineers face today may be set up as a system of linear equations. In this report it is attempted to solve the Helmholtz equation in a square via the use of both the Gauss-Seidel method and the Gauss-Seidel method with Successive Over Relaxation (or SOR). Each of these solution methods will attempt to solve a discretized version of the Helmholtz equation and attempt to solve it when this equation is set up as a system of linear equations, in order to solve for its unknown values. The two solution methods will be compared side by side to see the effects of SOR on the error value of a solution, if in fact the Helmholtz equation with its given boundary conditions does indeed converge.