Abstract

In this thesis optimality conditions and duality results are discussed for general nonlinear programming problem and fuzzy nonlinear programming problem in different situations.

In the first three chapters, E convex function and higher order generalized E-invex functions with differentiability assumption are introduced. The optimality conditions and duality results for general nonlinear programming problem using these functions are studied. Also these results are verified in some examples. In the next two chapters duality results for Lagrange dual, Fenchel dual, Fenchel-Lagrange dual using E-convexity are studied. The concept of conjugate function is used to construct second order Lagrange dual, second order Fenchel dual, second order Fenchel-Lagrange dual and the duality results are studied for these higher order duals. Last part of the thesis deals with fuzzy nonlinear programming problem. Here the concept of feasible region for fuzzy nonlinear programming problem is introduced and duality results for the fuzzy nonlinear programming problem with fuzzy inequalities are derived.

Keywords: E-convex set, E-convex function, fuzzy set, fuzzy inequality, conjugate function, strong duality, optimality condition.

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