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The Criterion for the Optimal Solution of Inventory Model with Stock-Dependent Consumption Rate

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Abstract

In 1989, Mandal and Phaujdar [Opsearch 26 43-46] considered an inventory model with stock dependent consumption rate and derived profit function without shortage allowed. However their algorithm was incomplete due to flaws in solution procedure. The purpose of this paper is to point out the sufficient and necessary condition of optimal solution to solve the same inventory model. For a linear demand rate dependent on stock level, the Newton-Raphson method is proven legitimately to find the optimal inventory level. Here we suggest an adequate starting point for the Newton-Raphson method from the Silver-Meal heuristic. Numerical examples illustrate that our starting point can be taken as an approximated solution for the optimal order quantity.

Keywords: Inventory, Stock-Dependent Demand rate, Newton-Raphson Method.