New Deterministic Solution to a Chance Constrained Linear Programming model with Weibull Random Coefficients

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Abstract

Linear Programming model is an important tool used to solve constrained optimization problems. In fact, the real life problems are usually occurring in the presence of uncertainty. For instance, in managerial problems of assigning employees to different tasks with the aim of minimizing the total completion time, or maximizing the total productivity, which are better described as random variables. Therefore, the use of the Probabilistic Linear Programming model with random coefficients has drawn much attention in recent years. One of the most frequently used approaches to solve the Probabilistic Linear Programming model is the Chance Constrained Linear Programming approach. In this paper, a Chance Constrained Linear Programming model with Weibull random coefficients is proposed. The proposed model is introduced in the Bivariate form with two of the L.H.S technologic coefficients are random variables. Moreover, the performance of the proposed model is shown through an application of allocating recruitment in Manpower Planning so as to optimize the jobs' completion time. The obtained results are compared with the results of another model that depends on approximating the distribution of the sum of Weibull random variables to the Normal distribution. This comparison verified the good performance of the new proposed model.

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