REDUCING VARIANCE IN A CROSSDOCKING SIMULATION MODEL USING COMMON RANDOM NUMBER AND ANTITHETIC VARIATES

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ABSTRACT:

This presentation discusses the application of variance reduction techniques that can improve the reliability and efficiency of the simulation experimental process by manipulating random number seeds for each source of model variation at each replication of the simulation. The two variance reduction techniques, Common random numbers and Antithetic variates, reduce the variance of the selected output performance measure by replacing the original sampling procedure with a new procedure that yields the same expected value but with a smaller variance. The application of the variance reduction techniques is illustrated using results from the simulation of a Crossdocking distribution centre. From our results, both Common random numbers and Antithetic variates perform appreciably in reducing the variance of the simulation output performance measure.

Keywords: Crossdocking, Variance, Common Random Numbers, Antithetic Variates