SIPLIB: A Stochastic Integer Programming Test Problem Library

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Overview:

SIPLIB is a collection of test problems to facilitate computational and algorithmic research in stochastic integer programming. The test problem data is provided in the standard SMPS format unless otherwise mentioned. Where available, information on the underlying problem formulation and known solution is also included.

Problem Sets:

The DCAP test set: A collection of 12 two-stage stochastic integer programs arising in dynamic capacity acquisition and allocation under uncertainty. All problem instances have complete recourse, mixed-integer first-stage variables, pure binary second-stage variables, and discrete distributions. *Contributed by: Renan Garcia. Last Update: 8/8/2002.*

The EXPUTIL test set: A collection of 9 instances of a single-stage nonlinear stochastic 0-1 problem, specifically an expected utility knapsack problem. *Contributed by: Shabbir Ahmed. Last Update: 6/17/2013.*

The MPTSP test set: A collection of 5 instances of a two stage stochastic 0-1 problem arising in city logistics. *Contributed by: Luca Gobbato, Guido Perboli and Francesca Maggioni. Last Update: 02/25/2015.*

The PROBPORT test set: A collection of 10 instances of a chance constrained portfolio optimization problem. *Contributed by: Feng Qiu. Last Update: 10/05/2013.*

The SEMI test set: The SEMI test problem suite consists of 3 instances of a two-stage multi-period stochastic integer problem arising in the planning of semiconductor tool purchases. The instances have mixed-integer first-stage variables and continuous second-stage variables. *Contributed by: Gyana Parija. Last Update: 8/14/2002.*

The SMKP test set: The SMKP test problem suite consists of 30 instances of a two-stage stochastic multiple knapsack problem. The instances of binary first and second stage variables. *Contributed by: Gustavo Angulo. Last Update: 4/28/2014.*

The SIZES test set: The SIZES test problem suite consists of 3 instances of a two-stage multi-period stochastic mixed integer program arising in the product substitution applications. The problems have mixed-integer variables in both stages. The problem formulation and data is from the paper "Selection of an optimal subset of sizes" by S. Jorjani, C. H. Scott, and D. L. Woodruff. *Contributed by: Nan Kong. Last Update: 8/19/2002.*

The SSLP test set: The SSLP suite consists of 12 instances of a two-stage stochastic mixed-integer programs arising in server location under uncertainty. The problems have pure binary first-stage variables, mixed-binary second-stage variables, and discrete distributions. *Contributed by: Lewis Ntaimo and Suvrajeet Sen. Last Update: 12/20/2004.*

The VACCINE test set: A collection of 30 instances of a chance constrained vaccine allocation problem. *Contributed by Lewis Ntaimo. Last Update: 10/14/2013.*

Citation:

To cite the test problems in this collection either cite the original papers where the problems are described or use the following citation:

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Comments and Feedback: sahmed@isye.gatech.edu
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