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An XML-based schema for stochastic programs. (English) Zbl 1163.90683
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Summary: This paper describes a proposed format to record instances of stochastic programs. It forms part of a larger XML-based schema that is designed to allow the expression of essentially any type of mathematical program within a unifying framework. A wide variety of different linear and nonlinear stochastic programs can be handled, and the paper describes in some detail how this is done. Screen captures and sample problems illustrate the use of the schema.

MSC:

90C15 Stochastic programming

90-04 Software, source code, etc. for problems pertaining to operations research and mathematical programming

Cited in 1 Document

Software:

AMPL; GAMS; LOQO; MINOS; MSLiP; NETGEN; OSiL; QSopt; SMPS reader; Xerces; XMLSpy

Full Text: [DOI](#)

References:

- [1] Apache Software Foundation (2007). The Xerces C++ solver. World-wide web document <http://xml.apache.org/xerces-c/> , accessed 7 June 2007.
- [2] Altova GmbH (2007). XMLSpy-XML editor for modeling, editing, transforming, and debugging XML technologies. World-wide web document http://www.altova.com/products/xmlspy/xml/_editor.html , accessed 7 June 2007.
- [3] Birge, J. R., \& Louveaux, F. (1997). Introduction to stochastic programming. Springer series in operations research. New York: Springer. · [Zbl 0892.90142](#)
- [4] Birge, J. R., Dempster, M. A. H., Gassmann, H. I., Gunn, E. A., King, A. J., \& Wallace, S. W. (1987). A standard input format for multiperiod stochastic linear programs. *COAL Newsletter*, 17, 1-19.
- [5] Brooke, A., Kendrick, D., \& Meeraus, A. (1988). GAMS-A user's guide. Redwood: Scientific Press.
- [6] Charnes, A., \& Cooper, W. W. (1959). Chance-constrained programming. *Management Science*, 5, 73-79. · [Zbl 0995.90600](#) · [doi:10.1287/mnsc.6.1.73](#)
- [7] Conn, A. R., Gould, N. I. M., \& Toint, P. L. (2006). The SIF reference document. World-wide web document <http://www.numerical.rl.ac.uk/lancelot/> , accessed 13 July 2006.
- [8] Cook, W. J. (2006). MPS format. World-wide web document [http://www2.isye.gatech.edu/\(\sim\)wcook/qsopt/hlp/ff_mps_format.htm](http://www2.isye.gatech.edu/(\sim)wcook/qsopt/hlp/ff_mps_format.htm) , accessed 6 September 2006.
- [9] Dentcheva, D., \& Ruszczyński, A. (2006). Portfolio optimization with stochastic dominance constraints. *Journal of Banking and Finance*, 30(2), 433-451. · [doi:10.1016/j.jbankfin.2005.04.024](#)
- [10] Edwards, J. (1988). A proposed standard input format for computer codes which solve stochastic programs with recourse. In Y. Ermoliev \& R. J.-B. Wets (Eds.), *Springer Series in Computational Mathematics : Vol. 10. Numerical techniques for stochastic optimization* (pp. 215-227). Berlin: Springer. · [Zbl 0661.90067](#)
- [11] Fourer, R., Gay, D. M., \& Kernighan, B. W. (2003). *AMPL—a modeling language for mathematical programming*, 2nd ed. Pacific Grove: Brooks/Cole-Thomson Learning. · [Zbl 0701.90062](#)
- [12] Fourer, R., Ma, J., \& Martin, R. K. (2006a). Optimization services (OS) overview. World-wide web document <http://gsbkip.chicagogsb.edu/os/os/> , accessed 13 November 2006.
- [13] Fourer, R., Ma, J., \& Martin, R. K. (2006b, submitted). OSiL: An instance language for optimization, Computational optimization and applications (2006). Preprint available at <http://gsbkip.chicagogsb.edu/os/publications/OSiL1.pdf> . · [Zbl 1189.90007](#)
- [14] Gassmann, H. I. (1990). MSLiP: An algorithm for the multistage stochastic linear programming problem. *Mathematical Programming*, 47, 407-423. · [Zbl 0701.90070](#) · [doi:10.1007/BF01580872](#)
- [15] Gassmann, H. I. (2006). The SMPS format for stochastic linear programs. World-wide web document <http://myweb.dal.ca/gassmann/smps2.htm> , accessed 13 July 2006. · [Zbl 1105.90339](#)
- [16] Gassmann, H. I., \& Prékopa, A. (2005). On stages and consistency in stochastic programming. *Operations Research Letters*,

33(2), 171–175. · Zbl 1099.90035 · doi:10.1016/j.orl.2004.04.013

- [17] Gassmann, H. I., & Schweitzer, E. (2001). A comprehensive input format for stochastic linear programs. *Annals of Operations Research*, 104, 89–125. · Zbl 1081.90503 · doi:10.1023/A:1013138919445
- [18] Gay, D. M. (1986). Electronic mail distribution of linear programming test problems. Numerical analysis manuscript 86-0, AT&T Bell Laboratories, Murray Hill, NJ.
- [19] Gay, D. M. (1993). Hooking your solver to AMPL. Numerical analysis manuscript No. 93–10, AT&T Bell Laboratories, Murray Hill, NJ, revised 1997. Also available as world-wide web document <http://www.ampl.com/REFS/hooking2.pdf>.
- [20] Halldórsson, B. V., Thorsteinsson, E. S., & Kristjánsson, B. (2001). A Modeling interface to non-linear programming solvers—an instance: xMPS, the extended MPS format. Carnegie Mellon University Mathematical Sciences department working paper, available as world-wide-web document http://www.mmedia.is/esth/papers/xmps-2000_022000.pdf, accessed 13 November 2006.
- [21] Hock, W., & Schittkowski, K. (1981). Test examples for nonlinear programming codes. *Lecture notes in economics and mathematical systems* (Vol. 187). New York: Springer. · Zbl 0452.90038
- [22] King, A. J. (2007). COIN-OR stochastic modeling interface. World-wide-web document <https://projects.coin-or.org/Smi>, accessed 7 June 2007.
- [23] Klein Haneveld, W. K. (1986). Duality in stochastic linear and dynamic programming. *Lecture notes in economics and mathematical systems* (Vol. 274). New York: Springer. · Zbl 0598.90062
- [24] Klingman, D., Napier, A., & Stutz, J. (1974). NETGEN: A program for generating large scale capacitated assignment, transportation, and minimum cost flow network problems. *Management Science*, 20, 814–821. · Zbl 0303.90042 · doi:10.1287/mnsc.20.5.814
- [25] LPSolve (2006). MPS file format. World-wide web document <http://lpsolve.sourceforge.net/5.1/mps-format.htm>, accessed 6 September 2006.
- [26] Ma, J. (2005). Optimization services (OS). Ph.D. thesis, Industrial Engineering and Management Sciences, Northwestern University. Available as world-wide web document <http://gsbkp.chicagogsb.edu/os/publications/Thesis2005.pdf>, accessed 6 September 2006.
- [27] Ma, J. (2006). Welcome to the official optimization services (OS) home. World-wide web document, <http://www.optimizationservices.org/>, accessed 23 August 2006.
- [28] MOSEK ApS (2007). The MPS file format. World-wide web document http://www.mosek.com/fileadmin/products/5_0/tools/doc/html/capi/nc, accessed 3 October 2007.
- [29] Murtagh, B. A., & Saunders, M. A. (1987). MINOS 5.1 user’s guide. Technical report SOL 83-20R, Systems Optimization Laboratory, Stanford University (revised).
- [30] Netlib.org (2006). Netlib linear programming test set. World-wide web document <http://www.netlib.org/lp/index.html>, accessed 13 July 2006.
- [31] Optimization Technology Center (2007). MPS input format. World-wide web document <http://www-fp.mcs.anl.gov/OTC/Guide/OptWeb/continuo>, accessed 3 October 2007.
- [32] Pintér Consulting Services (2002). LGO: A model development system for continuous global optimization. User’s guide. Halifax, Nova Scotia, Canada.
- [33] Prékopa, A. (1995). *Stochastic programming*. Dordrecht: Kluwer Academic. · Zbl 0834.90098
- [34] Refsnes Data (2006). Introduction to XML. World-wide web document http://www.w3schools.com/xml/xml_what.asp, accessed 13 November 2006.
- [35] Rockafellar, R. T., & Wets, R. J.-B. (1991). Scenario and policy aggregation in optimization under uncertainty. *Mathematics of Operations Research*, 16, 119–147. · Zbl 0729.90067 · doi:10.1287/moor.16.1.119
- [36] Rockafellar, R. T., & Uryasev, S. (2000). Optimization of conditional value-at-risk. *Journal of Risk*, 2, 21–41.
- [37] Schittkowski, K. (1987). More test examples for nonlinear programming. *Lecture notes in economics and mathematical systems* (Vol. 282). New York: Springer. · Zbl 0658.90060
- [38] Schittkowski, K. (2006). Test problems for nonlinear programming—user’s guide. World-wide web document [http://www.uni-bayreuth.de/departments/math/\(\sim\)kschittkowski/tpnp.htm](http://www.uni-bayreuth.de/departments/math/(\sim)kschittkowski/tpnp.htm), accessed 13 July 2006.
- [39] Thorsteinsson, E. S. (1999). xMPS, the extended MPS format for non-linear programs. Technical report 99-224, Carnegie Mellon University, Mathematical Sciences Department, December 1999, available as world-wide-web document <http://www.mmedia.is/esth/papers/xm> 1999_121999.pdf, accessed 13 November 2006.
- [40] Tsay, R. S. (2002). *Analysis of financial time series*. New York: Wiley. · Zbl 1037.91080
- [41] Vanderbei, R. J. (2006). LOQO user’s manual—Version 4.05. Technical report ORFE-99, Department of Operations Research and Financial Engineering, Princeton University, Princeton, NJ. Also available as world-wide web document [http://www.princeton.edu/\(\sim\)rv](http://www.princeton.edu/(\sim)rv).
- [42] Wolfram Research (2007). Multivariate ARMA models. World-wide web document <http://documents.wolfram.com/applications/timeseries/UsersG>, accessed 3 October 2007.
- [43] Ziena Optimization (2006). Knitro 5.0 interfaces. World-wide web document <http://www.ziena.com/interfaces.htm>, accessed 13 July 2006.

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