

PACKAGE ID - 001145MLTPL00 PCX

KWIC TITLE - Interior-Point Linear Programming Solver

AUTHORS - Czyzyk, J.
Argonne National Lab., IL (United States)

Mehtrova, S.
Northwestern University, Chicago, IL (United States)

LIMITATION CODE -COPY **AUDIENCE CODE** - UNL

COMPLETION DATE - 06/01/1996 **PUBLICATION DATE** - 10/29/1996

DESCRIPTION - PCX solves linear programming problems using the Mehrota predictor-corrector interior-point algorithm. PCX can be called as a subroutine or used in stand-alone mode, with data supplied from an MPS file. The software incorporates modules that can be used separately from the linear programming solver, including a presolve routine and data structure definitions.

PACKAGE CONTENTS - Media Directory; Software Abstract; User's Guide; Media Includes Source Code, Compilation Instructions, Linking Instructions;

SOURCE CODE INCLUDED? - Yes

MEDIA QUANTITY - 1 3.5 Diskette

METHOD OF SOLUTION - The Mehrotra predictor-corrector method is a primal-dual interior-point method for linear programming. The starting point is determined from a modified least squares heuristic. Linear systems of equations are solved at each interior-point iteration via a sparse Cholesky algorithm native to the code. A presolver is incorporated in the code to eliminate inefficiencies in the user's formulation of the problem.

COMPUTER - MLT-PLTFM

OPERATING SYSTEMS - Machine dependent

PROGRAMMING LANGUAGES - C (90%) FORTRAN (10%)

SOFTWARE LIMITATIONS - There are no size limitations built into the program. The size of problem solved is limited by RAM and swap space on the user's computer.

SOURCE CODE AVAILABLE (Y/N) - Y

UNIQUE FEATURES - PCX is a freely available linear programming code with reusable code modules, and reusable data structure.

RELATED SOFTWARE - Solvers that implement a similar algorithm are available commercially; examples include LOQO, OSL(from IBM),

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RELATED SOFTWARE - (CONT) CPLEX barrier (from CPLEX, INC.). PCX uses a freely available Fortran code for direct sparse Cholesky factorization written by Esmond Ng and Barry Peyton at Oak Ridge National Laboratory, incorporating a multiple-minimum-degree ordering code written by Joseph Liu and the University of Waterloo, Waterloo, Ontario, Canada.

OTHER PROG/OPER SYS INFO - The READMPS file contains instructions for installing the program and MAKEFILE the instructions for using the make program to compile the software. Both are included in the software package as distributed.

HARDWARE REQS - At least 8 Mbytes of RAM is recommended.

TIME REQUIREMENTS - Time required for execution depends on the size and properties of each individual problem. Test problems require as little as 0.2 seconds and as much as 12 hours on a SUN SPARCstation-5.

REFERENCES - Joseph Czyzyk, Sanjay Mehrotra, and Stephen J. Wright, PCx User Guide, Technical Report OTC 96/01, October 29, 1996.

ABSTRACT STATUS - Submitted 01/15/97. Released AS-IS 2/27/97

SUBJECT CLASS CODE - P

KEYWORDS -

COMPUTER PROGRAM DOCUMENTATION
P CODES
ALGORITHMS
ITERATIVE METHODS
LINEAR PROGRAMMING
OPTIMIZATION
COMPUTER CALCULATIONS

EDB SUBJECT CATEGORIES -
990200

SPONSOR - DOE/ER

PACKAGE TYPE - AS - IS