OPTIMIZATION TECHNOLOGY CENTER

PCx User Guide: Windows 95/NT Supplement[1]

by

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ABSTRACT

We describe the installation and use of the Windows 95/NT version of PCx, the primal-dual interior-point code for linear programming. This document is a supplement to the PCx User Guide, which describes the Unix version of the code.

The current version number is 1.0.

Key words: linear programming, interior-point methods, software, Windows 95/NT.

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1 Introduction

PCx is a linear programming solver developed at the Optimization Technology Center at Argonne National Laboratory and Northwestern University. Instructions for downloading, installing and using the Unix version of PCx can be found in the PCx User Guide[1]. Most of the material in the Guide remains relevant to the Windows 95/NT version of the code. The main difference from the user's point of view is in the process of inputting parameters to override the default setting. This task is performed through a Windows interface rather than by the more primitive means of editing a specifications file, as required in the Unix version.

2 Obtaining and Installing PCx for Windows 95/NT

A pkzip file containing documentation, the executable, the copyright statement, and some sample input files can be obtained through the World Wide Web and anonymous ftp. The home page is

```
http://www.mcs.anl.gov/otc/Tools/PCx/Windows/
```

This page contains a link to the self-extracting archive file `pcx-zip.exe`. Download and save this file in a new directory, then double-click to extract the files mentioned above. By default the PCx files will be extracted in the directory `C:\PCx\`. You can choose a different directory by making a change in the extractor window.

PCx requires the presence of some C runtime DLL libraries on your system. If you try to run PCx (see next section) and it responds with a notice that one of the DLL files (e.g., `MSVCRT.DLL`) is not present, copy the file from the subdirectory `dll` into the directory that contains PCx.

The distribution file can also be retrieved via anonymous ftp. Go to `ftp.mcs.anl.gov` and login as `anonymous`. The zip file can be found at:

```
ftp://ftp.mcs.anl.gov/pub/neos/PCx/Windows/pcx-zip.exe
```

Be sure to use `binary` mode when downloading via ftp.

Source code, test problem results, and further information about PCx can be found on the main PCx home page at

```
http://www.mcs.anl.gov/otc/Tools/PCx/
```

3 Running PCx

PCx is invoked by simply double-clicking on the PCx icon. Then click `START` on the introductory window to bring up the main operating window.

To run PCx with the default options, type the name of the MPS file in the operating window. If this file is in the same directory as the PCx executable, the file name alone will suffice. Otherwise, give the full DOS path to the MPS file. Finally, click `SOLVE` to activate PCx.

Note that the file name is not case sensitive. For example, the file `afiro.mps` can be accessed by typing `AFIro.mPS` in the operating window. Users should bear this feature in mind when naming files. For example, unpredictable results will be obtained if two files named `AFIRO.mps` and `afiro.mps` reside in the same directory.

If the input file has the `.mps` extension, this extension may be omitted when entering in the operating window.

A console window will appear to monitor the execution of PCx. The information printed to this console is saved in a log file (named `afiro-log.txt` for the problem `afiro`) which resides in the same directory as the input file. A file containing the solution (named `afiro-sol.txt` for `afiro`) is also written to the input directory. Both files can be manually opened by the user by double-clicking.

If you are using Windows NT, it is possible to put a scrollbar on the console window that appears. First, solve a problem using the interface. When the console window appears, click on the menu bar at the top of the window. Select "Properties..." Increase the Height and Width of the screen buffer size and press `OK`. (The setting for the window buffer size may be under the layout tab.) Select "Save properties for future windows with same title" and press `OK`. Any future PCx windows that appear will have a scrollbar attached to them.

To solve another problem, type the name of another MPS file in the operating window and click `SOLVE` again. The same console window will be used to monitor the new problem.

The default settings of certain parameters governing the execution of PCx can be overridden by using the `OPTIONS` button on the operating window. A click on this button will produce a window with the current parameter settings displayed in various fields, which may be edited by the user. An explanation of the significance of the various parameters can be found in [1, Section 6]. See Table 1 for the correspondence between the parameter keywords of [1] and the field names in the `OPTIONS` window. Click `OK` to fix the modified parameters and return control to the operating window. Subsequent uses of `SOLVE` in the session will make use of the modified parameters, which can be changed between solves. All changes are, however, discarded when the user clicks `QUIT`. The default values will apply next time PCx is invoked.

Warning: PCx should not be invoked more than once at a time from the same directory. The reason is that changes to the parameters are stored in a file called `PCxwindows.specs`, and there are no locking devices to protect the file from access by more than one PCx process at a time. For the same reason, `PCxwindows.specs` should not be modified directly by the user while a PCx session is in progress.

Keyword in [1]	**Field name in OPTIONS window**
`boundname`	Bound Name
`cachesize`	Cache size
`centerexp`	Exponent for Centering Parameter
`dualfeastol`	Dual Feasibility Tolerance
`HOCorrections`	Perform Higher-Order Corrections?
`inputdirectory`	No equivalent
`iterationlimit`	Iteration Limit
`max`	Maximization
`MaxCorrections`	Maximum Corrections
`min`	Minimization
`objectivename`	Objective Cost Name
`opttol`	Optimality Tolerance
`preprocess`	Presolve?
`presolve`	Presolve?
`prifeastol`	Primal Feasibility Tolerance
`rangename`	Range Name
`refinement`	Perform Iterative Refinement?
`rhsname`	Right Hand Side Name
`scaling`	Perform scaling?
`solution`	Do you want a solution file to be written?
`stepfactor`	Step Scaling Minimum
`unrollinglevel`	Level of Loop Unrolling

Table 1: Correspondence between keywords in the PCx User Guide and field names in the OPTIONS window of the Windows 95/NT version of PCx

References

[1] J. Czyzyk, S. Mehrotra, and S. J. Wright, *PCx User Guide*, Technical Report OTC 96/01, Optimization Technology Center, Argonne National Laboratory and Northwestern University, October 1996.