Klotski Solver 1.7

Readme file

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1 Introduction

Main purpose of program Klotski Solver v1.7 is calculating of shortest path to the solutions of game like Klotski, Gnotski, Klocki and some part of another popular puzzles. It was optimized for big calculations, lasting days and weeks. But you may use it for small too.

Program is released under GPL v3 license. See license.txt file for details.

2 Requirements

This program was compiled and tested on 64-bit GNU/Linux system and 32-bit Windows under wine (I can't do tests under 'real' Windows because I don't use this system). Probably you may compile source code under almost all 32 and 64 bit systems. If you want, try at your own system and architecture :) Program can run in both serial and parallel mode (using MPI library).

3 Restrictions

Size of boards can't exceed 127 squares. It is caused by representation of board in computer memory. This restriction usually is not very important, because it involves many days of calculations and requires terabytes of storages.

4 Usage

There is 6 obligatory parameters. You have to write them in way described below (order is significant).

Example of typical (serial) command:

solver.exe 270 25 31 0.38 25 input.txt > output.txt 2> output.err

where:

270 max. amount of memory allocated by program in megabytes (MiB)

25 max. amount of disc space taken by program in gigabytes (GiB)

31 for spare of memory, split configurations into some pieces ('baskets'). For bigger calculations it should be about 70-100 or even more.

0.38 advanced options: excess of memory for so-called hashes. this value is almost optimal. if you encounter problems with hashes, increase to 0.4 or maybe 0.45 in worst cases

25 how seldom hold generations on disc. here: store only one per 25 generations. It is for saving disc space. Bigger value causes more required memory when program will be print path to the solution. Unfortunately it is not possible to give here some universal value. Typically: 10 – 50

input.txt file with data describing Klotski board. See "*Klotski Solver - preparing input files.pdf*" for further details. At Examples directory you will find some examples.

output.txt file with results of calculations

output.err file with some diagnostic informations. Useful if you will go to troubles or if you will want to precise monitor progress of calculations

Example of parallel command:

mpirun -np 2 solver.exe 270 25 31 0.38 25 input.txt > output.txt 2> output.err

where all parameters have the same meaning as described above, except of "**-np 2**" which means: run on two CPU cores.

You may also simply run without any parameters:

solver.exe

and program will write similar short info and informations about additional (optional) parameters.

5 Compilation

Example of typical (serial) compilation:

g++ solver.cpp -O3 -o solver.exe

Example of parallel compilation:

mpic++ solver.cpp -DUSE_MPI -O3 -o solver.exe

Optionally add **-DNO_STATISTICS** flag, if you want to turn off writing diagnostic informations.

6 Contact

If You have any questions, problems or whatever another related to this Solver, please do not hesitate to write me an e-mail:

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