

Documentation for First Project

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Subject: Advanced Algorithms
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1 Information about program

For this project I decided to use method when my program parsing data input file, then create new output file for external solver. External solver then solves problem and saves it in another file that the program reads and prints the result to file and to systemout.

As solver program was chosen Lp solve: <http://sourceforge.net/projects/lpsolve/>

Project is programmed in ruby programming language: <http://www.ruby-lang.org/en/>

Description step-by-step:

Program <file.in> <file.out> Run program with file input

...parse input

make file: outputForLpSolve.lp

lp_solve outputForLpSolve.lp

...solving problem

make file: outFromLpSolve.txt

...parse file

print result also create output file

1.1 Results and problems

Entering the project was successfully processed. But there are some performance complication: primarily to describe the rules for individual matrix elements, it should be a large number of variables, which slows the calculation.

For example: to solve matrix 4x4 is needed 96 additional variables and 240 additional constraints. To solve matrix 8x8 is needed 896 additional variables and 2240 additional constraints. This is big performance problem because lp solve is not multicore application and calculation takes lots of time.

1.2 Instalation of needed programs

To run our program is needed ruby programming language and ILP solver LP_solve

Ubuntu GNU/Linux:

Ruby Instalation:

```
# apt-get instal ruby
```

Lp_solve instalation:

```
# apt-get instal lp-solve
```

Archlinux:

Ruby Instalation:

```
# pacman -S ruby
```

Lp_solve instalation:

```
# pacman -S lp_solve
```

1.3 Run program

Unpack program to directory from zip archive or download it with GIT

```
$ git clone git://github.com/zajca/Projekt_ADV_ALG.git
```

- Run program:

```
$ ruby project.rb <input file> <output file>
```