

# User Guide

This user guide explains all the functions of the crossword construction program made for the thesis. To use this program one must have installed Java developers kit of version 7. To start program one should do the following actions:

1. Open command line
2. Change working directory to programs src folder
3. Compile the program using command: `javac cw\gui\MainWindow.java`
4. Run the program using command: `java cw.gui.MainWindow`

The program has following functions:

1. Create a new grid
2. Save already drawn grid
3. Load grid, that was saved before
4. Load dictionary
5. Fill the grid

To create a new grid one should press the “New” button. A pop-up window will appear, where a user can set dimensions of the field on which the grid will be drawn. When the dimensions are set, one should press the “Ok” button and the field of the chosen size will appear on screen. The grid itself is constructed by making entries on field, one by one. To make an entry one should click on the point from which this entry should start and then on the point, where it should end. Entry is then created and the squares it took are then coloured grey.

If one would like to use created grid in future, he can use save option, so he wouldn't need to draw this grid all over again. To do so, one should press “Save” button. A standard Windows explorer window will pop-up, where one can choose the directory, where grid should be saved, and the name for the grid file. Then one should confirm his choice and the grid will be save to the set directory. All saved grids have “.cw” extension. One can continue his work with this grid, but must keep in mind that any further changes won't affect this saved file.

If one wishes to use an earlier saved grid, he can do so by pressing “Open” button. A standard Windows explorer window will pop-up, where one should find the directory, where the grid was saved, and choose the desired grid file (with extension .cw). After the desired grid file is chosen, one should confirm his choice. Then the grid is reconstructed automatically from the chosen file. One can apply any changes to this grid, they won't affect this save file.

To construct a crossword program requires a dictionary, from which it will fill the grid. One can chose this dictionary by pressing “Load dictionary” button. A standard Windows explorer window will pop-up, where one should choose a directory, where the desired dictionary is, and the choose it. After this is done, one must confirm his choice and dictionary will be loaded and ready for work. Dictionaries must be of the following format: every line has one word, dictionary file is in .txt format.

When desired grid is created and dictionary chosen, one can finish the crossword construction by pressing “Solve” button. A pop-up window will appear in which one may choose a method, that will be used to fill the grid. The first entry in this window corresponds to the method itself, “Greedy CSP” to constrained satisfaction problem with greedy algorithm and “Simulated annealing” as it is. The second entry corresponds to the heuristic, which will be used by the previously chosen method to find candidate words. One can choose between “Consonant count” heuristic or “Pairwise distance” heuristic. The third entry is a function,

that only simulated annealing uses ( for evaluation of the candidate words). Currently there is only one option in this entry, which is “Pairwise distance”. All methods and heuristics are described in detail in the thesis. After all choices are made, one must confirm them by pressing “Ok” button. The program then proceeds to fill the given grid with words from loaded dictionary. If solution exists, the program ends its work with the filled grid and no additional messages. Otherwise, a pop-up window with exception will appear, telling that program couldn't find a solution. If so, one should consider construction of a new grid or choose another dictionary.