

Winter term 2015/16
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Combinatorial Optimization

Programming Exercise 1

Implement Edmond's `CARDINALITY MATCHING ALGORITHM`.

Program Specification: Your program must accept a filename as a command-line parameter (i.e. it must be called with `myprogram input.dmx`). The command-line parameter contains the filename of the file that encodes the graph.

Input: The input file is a DIMACS file that encodes an undirected graph. That means, the first line has the format

`p edge n m`

where n is the number of vertices of the graph and m is the number of edges. The following m lines have the format

`e i j`

where i and j are the indices of the vertices connected by this edge. The vertices are indexed from 1 to n . Lines starting with a `c` are comments and should be ignored. For a more complete definition of the DIMACS format, see <http://www.or.uni-bonn.de/lectures/ss12/praktikum/ccformat.pdf>. For testing purposes, you can use the files at <http://www.or.uni-bonn.de/lectures/ss12/praktikum/index.html>.

Output: Your program must write the matching, encoded exactly as the input in the DIMACS format, *and nothing else* to the standard output.

Programming Languages: Your program must be written in C or C++ and compile with a GNU compiler on a current Linux machine. Your submission must include the command with which the program can be compiled.

Criteria: The following criteria are relevant for the number of points you will be awarded: Correctness, speed, code documentation, number of compiler warnings, overall elegance.

(20 Points)

Information: Submissions by groups of up to **three** students are allowed.

Deadline: Tuesday, December 1, 2015, before the lecture. Send your program to cremer@or.uni-bonn.de.