Winter term 2013/14
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Combinatorial Optimization

Programming Exercise Sheet

Programming Exercise: Implement Edmond's Cardinality Matching Algorithm.

Program Specification: Your program must read input from stdin and write output to stdout. The input contains one line containing two integers n m (separated by a space). n is the number of vertices of the input graph G, m is the number of edges of G. The vertices are numbered from 0 to $n-1$. The following m lines each contain two different integers (separated by a space) specifying an edge of the graph. So the line a b specifies that vertices a and b are connected by an edge.
The output should have the same format and describe a maximum matching in G.

Example:
The input for K_3 could look like:
3 3
0 1
1 2
0 2

The output could look like:
3 1
0 1

Programming Languages: Your program must be written in C or C++ and compile with a GNU compiler on a current Linux machine. No external libraries (apart from the stl of course) may be used. The code should compile without warnings. It should be commented and structured appropriately. Variables should have meaningful names. Memory should be freed completely by the program.

Test instances: There will be instances to test your program on the homepage of the exercise soon.

Criteria: The following criteria are relevant for the number of points you will be awarded: Correctness, speed, code documentation, re-usability, robustness, simplicity and overall elegance of the implementation.

(32 points)

Deadline: Thursday, January 16, 2014, before the lecture. Please send your source code to klewinghaus@or.uni-bonn.de.