Graph reconstruction from degree sequences

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Results on deciding if a sequence of naturals can be the degree sequence of a graph are widely known. Algorithms resulting from theorems of Havel–Hakimi and Erdős–Gallai regarding the existence of degree sequences are studied in [1]. The problem of reconstructing a graph from a degree sequence is an NP-complete problem [2]. Consequently large-scale task (finding graphs with many vertices) can not be solved in reasonable time, but the size of the task can be increased using parallel algorithms. We will present here some several possible approaches.

References

[1] A. Iványi, L. Lucz, T. F. Móri, P. Sótér: On Erdős–Gallai and Havel–Hakimi algorithms, *Acta Universitatis Sapientiae, Informatica*, **3**, 2 (2011) 230–268.

[2] M. R. Garey, D. S. Johnson: *Computers and Intractability. A Guide to the Theory of NP-Completeness*, W. H. Freeman & Co. 1979.