

1 Theoretical part

2.1 (due Feb 5, 2008) CLRS: 26.2-4, 26.2-5, 26.2-8, 26.2-9, 26-1.

2 Applied part (due Feb 5, 2008)

2.2 (due Feb 5, 2008) Implement the “Edmonds-Karp” algorithm from section 26.2 of CLRS or “relabel-to-front” algorithm from section 26.5 of CLRS. Compare the running time of your implementation with the implementations available from <http://avglab.com/andrew/soft/prf.tar>.

Compare the running times for the following instances parameterized by integers A, N , and a real number $p \in [0, 1]$. The (random) graph will have N vertices, for each ordered pair of vertices u, v the edge (u, v) will be added with probability p (independent of the other edges). Each edge has uniformly random capacity from the set $\{1, 2, \dots, A\}$.

Run the algorithms for the following 80 settings of the parameters: $N \in \{100, 1000\}$, $p \in \{1/10, 2/10, \dots, 10/10\}$, and $A \in \{1, 2, 10, 100\}$.