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Gabow, Harold N.; Myers, Eugene W.

Finding all spanning trees of directed and undirected graphs.

SIAM J. Comput. **7** (1978), *no.* 3, 280–287.

The authors consider the problem of enumerating spanning trees of a directed graph in which all vertices are reachable from one vertex (the root). They propose an algorithm for solving this problem that requires time $O(V+E+EN)$ and space $O(V+E)$, where V, E and N are the numbers of vertices, edges and spanning trees, respectively. The algorithm is based on sequentially labelling admissible edges that are joined to a previously constructed subtree, and identifying those edges that are "bridges" belonging to any tree containing the existing subtree. This algorithm, applied to an undirected graph, yields all spanning trees (skeletons) in time $O(V+E+VN)$ with space $O(V+E)$. Some data from a machine experiment is presented and compared with other known algorithms. The problem of decreasing the time bound for finding all spanning trees and that of decreasing the necessary space for representing the tree of variant labelling (computational tree) are posed. *D. Ja. Keselman* (Irkutsk)