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REDUCING THE ADJACENCY MATRIX OF A TREE*

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Abstract. Let T be a tree, A its adjacency matrix, and α a scalar. We describe a linear-time algorithm for reducing the matrix $\alpha I_n + A$. Applications include computing the rank of A, finding a maximum matching in T, computing the rank and determinant of the associated neighborhood matrix, and computing the characteristic polynomial of A.

Key words. tree, graph, adjacency matrix, determinant, rank, eigenvalue

AMS(MOS) subject classification. Primary 05C05, 15A15, 15A18, 68R10

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