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Reconstructing Trees from their Wiener Matrix or Subtree Matrix.

Let T be a tree with vertex set $\{1, 2, \dots, n\}$. The Wiener matrix is $W = (w_{ij})$ where w_{ij} ($i \neq j$) is the number of paths in T containing both i and j . The subtree matrix is $S = (s_{ij})$ where s_{ij} ($i \neq j$) is the number of subtrees of T containing both i and j . In both W and S the diagonal entries are 0. Given either of these matrices we will show that we can reconstruct the adjacencies of T using the following simple rule: $i \sim j$ in T if and only if the (i, j) -th entry of the matrix is the largest in its row or column. (Received September 13, 2010)