# Minimum Number of Distinct Eigenvalues for Trees

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We study the minimum number of distinct eigenvalues required for the matrix pattern of any tree of fixed diameter. We take advantage of methods for pruning a given tree and introduce recursive constructions for establishing a lower bound on the distinct number of eigenvalues for a fixed diameter. A highlight of this research is that while the number of vertices grows very quickly with respect to the diameter, the minimum number of distinct eigenvalues grows relatively slowly. Additionally, the effect of the set of allowable edge weights upon both lower and upper bounds on the number of distinct eigenvalues is considered.