1116-05-2793        **Andrew Meier\*** (`ameier@nebrwesleyan.edu`) and **Austin Mohr** (`amohr@nebrwesleyan.edu`).
*Classification of Spanning Trees by Isomorphism.* Preliminary report.

A celebrated result of Cayley says there are $n^{n-2}$ labeled trees on $n$ vertices, and many elementary proofs are known. Significantly harder is the enumeration of unlabeled trees, for which no closed formula currently exists. We present a high-level description of an algorithm of McKay et al. that efficiently generates one copy of each unlabeled tree on a given number of vertices. Moreover, we know from Burnside's lemma that the size of the isomorphism class of a tree $T$ on $n$ vertices is $\frac{n!}{\mathrm{Aut}(T)}$. Taken together, we may fully classify all labeled trees on $n$ vertices according to isomorphism. The talk concludes with a demonstration of the algorithm implemented in Sage and discussion of a possible extension to classify the spanning trees of an arbitrary graph. (Received September 22, 2015)