

Counting labeled Greg cacti and clique trees

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A labeled Greg tree is a tree with 2-colored vertices where only the black vertices are labeled and the white vertices are of degree at least three. For a given number of labels, Flight gave a construction for all labeled Greg trees and derived a recurrence relation for their number. Originally considered for phylogenetic trees and similar evolutionary relationships, they also represent splitting structures for two-edge connected reliability. For three-edge connected reliability and two-vertex connected reliability, there are similar splitting structures with unlabeled vertices of degree at least three, where the underlying graph is no longer a tree. We therefore extended the definition of Greg trees to Greg cacti and Greg clique trees and derived recurrence equations for the number of graphs in those sets as well as some special subsets.

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