

Pebbling in Split Graphs

Glenn Hurlbert, Arizon State University, Tempe AZ – 85287

Abstract

Finding the pebbling number of a graph is harder than NP-complete (Π_2^P -complete, to be precise). However, for many families of graphs there are formulas or polynomial algorithms for computing pebbling numbers; for example, complete graphs, products of paths (including cubes), trees, cycles, diameter two graphs, and more. Moreover, graphs having minimum pebbling number are called Class 0, and many authors have studied which graphs are Class 0 and what graph properties guarantee it, with no characterization in sight. Here we investigate an important family of diameter three chordal graphs called split graphs; graphs whose vertex set can be partitioned into a clique and an independent set. We provide a formula for the pebbling number of a split graph, along with an algorithm for calculating it that runs in $O(n^{1.41})$ time. Furthermore we determine that all 3-connected split graphs are Class 0.

Keywords: graph pebbling, pebbling number, chordal graph, split graph.