

CS 598mp: Fall 2005: Homework #4
Due on Wed 9 Nov
Hand over in class or to Colin Robertson at 3229 SC

Problem 1. (Series-parallel graphs are of tree-width 2)

Prove that series-parallel graphs are of tree width 2.

Problem 2. (Interpretations)

We showed finite binary trees have a decidable monadic theory. The goal of this exercise is to show that 4-ary trees also have a decidable monadic theory.

Consider 4-ary trees: finite trees where each node has four children or no children. Show that *MSO* over these trees is decidable, where *MSO* has four successor relations: $succ_i(x, y)$ for $i \in \{0, 1, 2, 3\}$. Show this using an *interpretation* on binary trees.

(Hint: Map the four children of a node in the 4-ary tree to the four grand-children of the corresponding node in the binary tree)