# MCS vs MNS

A graph search traverses through the vertices of a graph and output them as a sequence (a vertex ordering). Two of the most known graph searches are Breadth First Search (BFS) and Depth First Search (DFS). This project deals with two other graph searches - Maximum Cardinality Search (MCS) and Maximal Neighborhood Search (MNS). MCS works as follows: Number the vertices from n to 1 as follows - as the next vertex to number, select a vertex adjacent to the largest number of previously numbered vertices, breaking ties arbitrarily. MNS works as follows: start with a vertex u and set its label as {n+1} and set the label for all other vertices as {}. From i = 1 to n, choose ith vertex by selecting an unselected vertex whose label is maximal (under set inclusion) and then adding i to the labels of all its neighbors. Two graph searches are equivalent on a graph if the lists of sequences produced by both are the same. The objective of this project is to find the class of graphs for which MCS is equivalent to MNS. This was raised as an open question recently.