ABSTRACT

Concept of Pathwidth and Treewidth contributes a lot in graph theory and also these two terms are very related with each other. These concepts are useful to solve many NP-hard problems in graph theory. In this thesis we study several algorithm for computing the pathwidth of general graphs and restricted classes of graph. We have studied exact recursive and dynamic programming algorithm for treewidth of graph. There exist a similar way to express the pathwidth of graph and in this thesis we give a recursive and dynamic programming algorithm to calculate the pathwidth of graph.

Since finding the exact pathwidth of general graphs is NP-complete, it is natural to ask if we could design efficient algorithm to compute the pathwidth of restricted classes of graph, so we study the computation of pathwidth for trees. We tried to understand the principal theorem to calculate a pathwidth of tree. On that basis we tried to make an algorithm for the graphs which can be represented as tree, for example some special type of graphs like cactus or series parallel graph.

In this study we worked on improvement of exact algorithm for general graph classes and also on algorithm to compute the pathwidth of cactus graph.