

An Algorithm for the Edge Coloring Problem

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Edge coloring problem is to find a minimum cardinality coloring of edges of a graph so that any pair of edges incident to a common node do not have the same colors. Edge coloring problem is NP-hard, hence it is unlikely that there exists a polynomial time algorithm. We propose an algorithm for the edge coloring problem, which is based on cutting plane approach and implicit branch and bound. We formulate the problem as a covering of edges by matching and find valid inequalities for the convex hull of feasible solutions. We show the valid inequalities are enough to determine the minimum coloring number (chromatic index) and propose a method to find violated inequalities and to do branch and bound search implicitly. An example is presented to show how the method works.