Abstract

Given an undirected graph $G= (V, E)$, the graph coloring problem consist in assigning a color to each vertex in such a manner that two adjacent vertex have assigned different colors. The processes of assigning the colors in the graph will done in a manner such that that the total number of different colors used is minimum. Most of the existing algorithms generally deal this problem by taking consideration above constraint during assigning the color to vertices in the graph, but some time above color assignment constraints creates some other implicit constraints which increases the complexity of the algorithms. In this paper we propose an algorithm for graph coloring problem which assign the colors to vertices of the graph with minimum number of colors and without creating any other additional constraints during color assignment that required to be handled explicitly.

References

1. Gamache M, Hertz A, Ouellet JO. “A graph coloring model for a feasibility problem in
2. Zufferey N, Amstutz P, Giaccari P. “Graph coloring approaches for a satellite range
time tabling problems”. In Eur J Oper Res 2007;176:177–92.
5. Werra D D, Eisenbeis C, Lelait S, Marmol B. “On a graph theoretical model for cyclic
6. Smith DH, Hurley S, Thiel SU. “Improving heuristics for the frequency assignment
problem”. In Eur J Oper Res 1998;107(1):76–86.
8. Méndez Díaz I, Zabala P. “A cutting plane algorithm for graph coloring”. In Discret Appl
Math 2008;156(2):159–79.
9. Lucet C, Mendes F, Moukrim A. “An exact method for graph coloring”. In Comput Oper
10. Méndez-Díaz I, Zabala P. “A branch-and cut algorithm for graph coloring”. In Discret
Appl Math 2006;154:826–47.
11. Malaguti E, Monaci M, Toth P. “An exact approach for the Vertex Coloring Problem”. In
12. Segundo PS. “A new DSATUR based algorithm for exact vertex coloring”. In Comput
13. Chaitin GJ. “Register allocation and spilling via graph coloring”. In SIGPLAN Not
14. Caramia M, DellOlmo P. “Coloring graphs by iterated local search traversing feasible
and infeasible solutions”. In Discret Appl Math 2008;156(2):201–17.
15. Josephine et.al “The Application of Graph Theory to Sudoku” Hang Lung Mathematics
4 issue 12,(2017)
17. Tabiya Manzoor Beigh, Girdhar Gopal . Use of Genetic Algorithm and Fuzzy Logic in
Optimizing Graph Coloring Problem in IJCA Proceedings on Recent Innovations in Computer
18. Zhaoyang Zhou, Chu-Min Li, Chong Huang, Ruchu Xu An exact algorithm with learning
for the graph coloring problem Computers & Operation Research 51(2014)282-301

Index Terms

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Keywords
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