

Abstract: Solving Sudoku Puzzles Based on Customized Information Entropy

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Abstract

Sudoku puzzle is one of the most popular games that are helpful to improve intellectual development in the world. And it also engages many scholars focus on solving algorithms and grading methods based on computers. In this paper, Sudoku puzzle is studied based on customized information entropy. An algorithm is designed to solve Sudoku puzzles based on the customized conception of information entropy and corresponding prototype is implemented in C++ by object-oriented programming method. The definitions of inverse information entropy and information amount for inverse information entropy are introduced and directly used instead of information entropy in order to simplify the solving procedure. Experimental results show that the algorithm has better time efficiency than available methods including generic algorithms and rule based algorithms and it can solve not only unique-solution puzzles (including extremely difficult puzzles) but also multiple-solution puzzles. Furthermore, it is a feasible choice to grade difficulty of Sudoku puzzles based on the customized information entropy.

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