Final Year Project Report

Full Unit - Backtracking and Recursion

Playing Games and Solving Puzzles Using AI

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Declaration

This report has been prepared on the basis of my own work. Where other published and unpublished source materials have been used, these have been acknowledged.

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Sudoku can be solved by backtracking, a variation of a depth first search, Sudoku has an initial and a goal test and actions must be performed by a solver to find the next state, so that the goal state may be found. A backtracking search on a Sudoku puzzle will search up to the depth of 81 if possible before trying other branches, however as the constraints of the puzzle can be checked during the search, not all states in a branch have to be checked. This results in an algorithm that is very efficient in both time and memory used, having at most 81 instances stored, and is complete, always finding a solution if there is one.