
Abstract

Shikaku is a logic puzzle which has several numbers distributed on an $N \times N$ matrix as a hints. particular sizes, where each of the partitions associated to a hint, the partitions do not overlap to each other, and the shape of all partitions must be rectangular. The problem of finding the solution of an Shikaku can be categorized as an NP-complete problem. In research we use a propositional logic approach to find all the solutions that exist in a Shikaku using Python. Python is chosen because it has Pycosat and Satisfy libraries which facilitate solution searching using an efficient SAT solver. The program can provide all possible solutions of an $N \times N$ Shikaku. We derive the number of clauses required to find all solutions of an $N \times N$ Shikaku in each of essential iterations. Our investigation is also supplemented with asymptotic complexity analysis of the algorithms to generate all required clauses. The results of this analysis provide a fact that the Shikaku can be solved in an exponential time with respect to the given number of hints and the size of the Shikaku given.

Keywords: Shikaku, propositional logic, SAT solver, Python.
