Non-Linear Great Deluge algorithm for Tanzanian High Schools Timetabling

Author: Mushi Allen R.

Abstract:

High school timetabling problem involves allocation of students, lessons, and teachers into timeslots while respecting constraints, both on students, teachers and other available resources. It is one of the Combinatorial Optimization Problems which are known to be NP-Hard and therefore no optimal algorithm is known for its solution. The problems differ from one institution to another depending on the educational system and administrative structures. In this paper, a Great Deluge Algorithm is developed based on an adaptation which employs a non-linear decay rate in the reduction of 'water level'. This is a case study in the application of the algorithm to Tanzanian high schools. The algorithm is tested on three high school systems in Tanzania. Since no such work has been previously done in Tanzania, the algorithm is compared with the manually generated timetables for the same schools. It has been shown that, the algorithm performs very well and can be used to greatly improve timetabling at Tanzanian high schools.

Keywords: High School Timetabling; Great Deluge; Combinatorial Optimization.