Modelling and Evaluating UMP Examination Timetable

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Abstract:
This paper introduces a real world examination timetabling problem from Universiti Malaysia Pahang (UMP). The UMP examination timetabling problem is a capacitated problem which considers room capacity constraint. At present, UMP operates from two campuses situated in Gambang and Pekan. The operation from two distant campuses formed new requirements (i.e. constraints) for the UMP examination timetable. The new constraints complicates the problem further in generating the examination timetable. An example of the new constraints includes scheduling exams into the appropriate campus and schedule similar exams held in different campus into the timeslot. Currently, UMP unable to determine the examination timetable quality due to having no formal mathematical model. Hence, the objective of this paper is to propose a formal mathematical model based on the new UMP examination constraints and to evaluate the quality of the generated examination timetable. Additionally, an implementation using traditional hill climbing algorithm were performed to assess the proposed formal mathematical model and to compare with the examination timetable used UMP. The result shows that the proposed formal mathematical model able to calculate the timetable quality.

Keywords: Examination Timetabling, Scheduling, Graph Heuristic, Hill Climbing

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