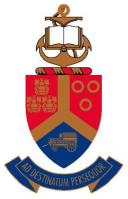

UNIVERSITEIT VAN PRETORIA
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COS 790: Hyper-Heuristics and Combinatorial Optimization
Assignment 1: Selection Constructive Hyper-Heuristics
Due Date: 25 August 2020, 23:30

Selection constructive hyper-heuristics have previously been employed for solving the examination timetabling problem. However, most of this research has focussed on selecting the heuristic to choose the examination to schedule next. This assignment involves extending this idea by employing a selection constructive hyper-heuristic that selects a heuristic to choose the examination and a heuristic to choose the period the examination should be placed in. The hyper-heuristic must be evaluated on at least two early, two late and two hidden problem instances from the ITC 2007 examination timetabling benchmark set. The problem instances can be accessed from `https://drive.google.com/drive/folders/1hE_22IA9ZPJUmC0a0il9NgtJnijTVcco?usp=sharing`. The first four instances are early, the second four late and the last for hidden. Details of the ITC 2007 benchmark set can be found at `http://www.cs.qub.ac.uk/itc2007/examtrack/exam_track_index.htm`

Assignments must be submitted via clickUP. The source code, compiled code and report must be submitted.

The report must include:

- A description of the low-level heuristics for examination selection.
- A description of the low-level heuristics for period selection.
- A description of the hyper-heuristic, including the approach used and the parameters for the approach.
- A description of the experimental setup, i.e. parameter values used for the algorithms, problem instances used, technical specifications of the machine used to develop the program and run simulations.

- Perform a minimum of ten runs, each with a different random number generator seed, for each problem instance for each selection constructive hyper-heuristics. List the best objective value, average objective value and standard deviation of the best objective value from the optimum over the ten runs for each problem instance, average runtime.
- A comparison of the performance of the hyper-heuristic with that of selection constructive hyper-heuristics employed in the literature for examination timetabling.

Total: 35