Elective Course Allocation with numerical preferences.

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1 Abstract

In Universities, students have to select a specified number of elective courses to be included in their curriculum. Elective courses are a good way to increase students motivation and improve their academic success. At HEC- Management School of the University of Liège, each student has to set a preference value for each course offered and taking a number of courses is mandatory to fulfill his curriculum. The Elective Course Allocation with Numerical Preferences (ECANP) is the problem of assigning to each student the requested number of courses such as to maximize the total preference score (i.e. the overall sum of preference values associated by each student to the courses he has been granted). The course assignment problem often comes along with the course time tabling problem. This issue is not considered in this work as a complete course schedule is available at the time of registration. Each student provides his own schedule availability and can only attend one course at a time. An additional constraint is that a course cannot be granted to a student if his preference value for this course is null. We present the set of rules defined to ensure that a feasible assignment can be obtained for each student. The ECANP problem is modeled as a mixed integer programming model and we use CPLEX to obtain optimal solutions for a set of realistic instances.

The ECANP problem is compared to the Elective Course Planning problem solved with heuristic methods in [2], to the course Allocation problem for which a bidding mechanism is described in [1] and to the College Admission (CA) problem as presented in [3]. In particular in the CA each student provides a preference order instead of numerical values and each student must be granted only one college. We discuss the differences between the mathematical formulations of theses problems and the ECANP problem, and their properties.

References

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