

# On Solving Academic Load Distribution Problem

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To solve problems arising in the field of education, for example, time-tables scheduling, assigning disciplines to teachers or teachers to schools, determining optimal tests of knowledge checking [2], etc., the models and methods of integer linear programming (ILP) are successfully applied. In particular, the problem of distribution of the academic load, in which the average number of disciplines given to each teacher is minimized, was considered [1]. The proposed mathematical model is a special case of the fixed charge transport problem. In addition, an equivalent combinatorial formulation of this problem was presented, its NP-hardness was proved, and a branch and bound algorithm was proposed. The disadvantage of this formulation is the fact that the load associated with a separate discipline can be allocated to a teacher in an arbitrary volume.

We propose to modify the problem of distribution of teachers academic load as follows. Each academic course consists of indivisible units, that should be given to one teacher. Moreover some other constrains are taken into account, for example, the maximum and the minimum possible amounts of load assigned to a teacher, in accordance with the share of the rate that he holds. Minimization of the maximal number of disciplines assigned to each teacher or the maximization of the total preference of "teacher-discipline" relationship assignments considered as optimization criterion. We show that the problem of finding a feasible solution is NP-hard.

ILP models are constructed, for one of which an L-class enumeration algorithm is proposed. The computational experiment with ILP methods is carried out on random instances and real data problems.

## References

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