

2-FACTOR RELAXATION APPLICATION FOR THE OPTIMIZATION OF ASSIGNMENT PROBLEM COMPUTATION

There are various methods for solving the assignment problem (AP), which are based using various approaches in the sphere of combinatorial optimization and characterized by different time complexity, which is not less than $O(n^3)$, where n – order of matrix values. One solution algorithm of different variants of AP, which has the reduced valuation is described in this paper. The computation optimization shows, that the 2-factor relaxation serves as the procedure, which is used in assignment problem for fast computation of more precise lower cost estimates of closed routes in the traveling salesman problem. The algorithm is a relevant matching of minimum total length in the bipartite graph with $2n$ vertexes, where we use the concept of the magnifying shortest path.

2-factor relaxation of calculations for optimization in the assignment problem searches the solutions to AP, determining matching in bipartite graphs with $2n$ vertexes, which contains k edges of minimum total length.

The proposed algorithm consists of the same number of stages and the same time complication as the best-known methods of optimal destination. It is called Hungarian method.

A new solution algorithm, which easily adapts to solve the 2-factor problem is described here. This is the same assignment problem (AP) with the restriction on the number of arcs in the circuits of the cyclic decay. The number of arcs in each circuit of cyclic decay should be more than 2. The limitations regarding prevention of bipartite graphs formation in the lower stages of development example will be established on the base of Hungarian method. In order to solve the assignment problem, while taking into consideration its large dimensions, it is better to use the algorithm modification restriction. In this case the algorithm of this method has the definite advantage compared to other methods. Although most of the algorithms of AP solution have the same theoretical difficulty estimations, but this algorithm is more efficient for large dimensional problems. In addition, with the increasing problem dimension the advantage of this method increases significantly compared to Hungarian method.

The proposed algorithm is better to apply for the implementation of computer as a component of software systems that are targeted for assignment problem, in particular, problems of large dimension. C++ programming language is used for the implementation of the software. It allows to calculate more correct and faster.

Conclusion. The application of the C++ programming language is used to implement the software. 2-factor relaxation of calculations for optimization in the assignment problem searches solutions to AP.