The Problem of Optimal Location of the Foodservice Point in the University Building

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We study a problem of optimal location of the cafeteria in the university building. The building is described as an undirected graph. Vertices of the graph are corresponded to the classrooms, to existing foodservice points and to potential spots of new cafeteria. Edges of the graph describe the connection of the vertices and are characterized by the time of transition between the vertices. Capacity of the classrooms allows us to assess the demand for food. According to the results of the empirical observation and the polls 1) we constructed the utility function on which buyers choose the foodservice point; 2) we determined the desired composition of the menu. Value of the utility function depends on the remoteness of foodservice point from the classrooms, product price, service queue, range of dishes. The potential spots of new cafeteria are characterized with their own costs on opening and rent. The best spot for cafeteria considering incomes is required to be found. This problem is formalized as an optimization problem with equilibrium constraints. As subproblem, we study the problem of complete ration selection for the students in the case of the limited budget and minimal eating time. In the report we study an experience of modeling the problem on the example of the School of Natural Sciences in Far Eastern Federal University.