

POLYHEDRAL PROPERTIES OF THE PROBLEM OF INTERRUPT-ORIENTED SERVICES OF JOBS BY SINGLE MACHINE

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A problem of services of various jobs by single machine is contemplated here [1]. There is a set of jobs defined $V = \{1, 2, \dots, n\}$. Each job $i \in V$ has positive weight ω_i , processing time p_i and release date r_i , during which it is unavailable for services. Processing time for various jobs are equal to each other $p_i = p$. In the process of work of machine interruptions are assumed. It is necessary to minimize total weighted completion time of serving all the jobs. Suppose $D = \{1, \dots, d\}$ is instant of time set, sufficient for serving all the jobs.

Here we contemplate the model of integer linear programming of the problem herein [2].

It is required to minimize the function $g(x, y) = \sum_{i \in V} \omega_i + \sum_{i \in V} \omega_i \left(\sum_{k=1}^{d-1} y_{ik} \right)$ under condition that

$$\sum_{i \in V} x_{ik} \leq 1, k = 1, \dots, d; \quad \sum_{k=1}^d x_{ik} = p, i \in V; \quad (1)$$

$$\frac{1}{p} \sum_{l=k+1}^d x_{il} \leq y_{ik} \leq \sum_{l=k+1}^d x_{il}, i \in V, k = 1, \dots, d-1; \quad (2)$$

$$x_{ik} \geq 0, i = 1, \dots, n, k = 1, \dots, d; \quad (3)$$

$$x_{ik} = 0, i = 1, \dots, n, k = 1, \dots, r_i; \quad (4)$$

$$y_{ik} \leq 1, i \in V, k = 1, \dots, d; \quad (5)$$

where variables are set as the following

$$x_{ik} = \begin{cases} 1, & \text{if } i \in V \text{ in the instant of time } k \in D, \\ 0, & \text{otherwise;} \end{cases}$$

$$y_{ik} = \begin{cases} 1, & \text{if by the instant of time } k-1 \text{ the job } i \text{ is not completely served yet,} \\ 0, & \text{otherwise.} \end{cases}$$

In the work the properties of polyhedron (1) - (5) for small p are contemplated.

REFERENCES

1. Peter Brucker, Sigrid Knust, "Complexity Results for Scheduling Problems" URL: [www//mathematik.uni-osnabrueck.de/research/OR/class](http://www.mathematik.uni-osnabrueck.de/research/OR/class).
2. R. Yu. Simanchev, N. Yu. Shereshik. Dichotomy scheme for smallest schedule time search for the problem of services of various jobs by one second source device // Herald of OmSU, #2. Omsk — 2013. pp. 48-50.