Solving inverse scheduling single machine problems by Karush-Kuhn-Tucker condition optimally

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Abstract

The importance of scheduling problems leads us to pay more attention in using solution methods. due to high costs of prossesing and job transfer, inverse scheduling problem has been used. In this paper inverse scheduling single machine has been considered in order to minimize the cost coefficient of time parameters setting. So Karush-Kuhn-Tucker condition has been used to represent a set of equations. The proposed solution method for these equations, could be solved by MATLAB.

Keywords: Scheduling, Inverse scheduling, Single machine, Karush-Kuhn-Tucker condition
Mathematics Subject Classification [2010]: 90B36, 68M20

1 Introduction

Consider single machine scheduling problem with n job.

- p_j: Processing time of job j
- C_j: Completion time of job j which is $\sum_{k=1}^{j} p_k$

Suppose scheduling problem is intended to minimize $\overline{C}$ which will be done with Shortest Processing Times [1]. In this sequence job has been sorted based on non-decrease processing time.

Theorem 1.1. *[1] The sequence job SPT($p_1 \leq p_2 \leq \cdots \leq p_n$), minimize the mean time of compeletion time*

Now, consider the problem discussed in [3] is solved by determining the minimum total setting of the job processing times so that a given sequence is converted into an SPT sequence. We formulate this problem as a mathematical programming:

$$\begin{array}{ll} min & \sum_{i=1}^{n} \alpha_i |p'_i - p_i| \\ s.t. & \\ & 0 \leq p'_1 \leq p'_2 \leq \cdots \leq p'_n \end{array} \tag{1}$$

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