

Minimizing Class-based Completion Time Variance on a Single Machine

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Abstract—We consider the problem of scheduling a set of simultaneously available jobs on a single machine. The objective is to determine a schedule that minimizes the class-based completion time variance (CB-CTV) of the jobs while reducing the overall CTV is taken as the secondary objective. This non-regular performance measure is closely related to service stability and of practical significance in many areas. We prove that a CB-CTV problem can be transformed into a series of CTV minimization problems, which allows us to apply the existing well developed properties and scheduling methods of CTV. Computational results are presented to show the trade-off between the overall CTV and CB-CTV and indicate that it is desirable to minimize CB-CTV with regard to service stability and consistency from customers' point of view.

Keywords—Completion time variance (CTV), Class-based completion time variance (CB-CTV), Job scheduling, Optimization

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