Coffman, E. G. jun.; **Gilbert, E. N.**

On the expected relative performance of list scheduling. (English) Zbl 0569.90044

Oper. Res. 33, 548-561 (1985).

Let $\bar{X} = (X_1, ..., X_n)$ denote an ordered list of service times required by n tasks. The service will be performed by $m \geq 2$ processors working in parallel. Each processor serves one task at a time and, having once started a task, finishes it before starting another. A schedule determines how the tasks are to be served. A list schedule keeps the tasks not yet serviced listed in the order prescribed by $\bar{X}$. Whenever a processor completes a service, it then takes its next task from the head of the list. The makespan of a schedule is the time required for all service to be completed. The makespan $L(\bar{X})$ of a list schedule is usually longer than necessary. Reordering the tasks in an optimal way can reduce the makespan to $OPT(\bar{X})$, the smallest possible makespan, but requires knowing the X_i in advance and solving an NP-complete problem. The ratio $R(\bar{X}) = L(\bar{X})/OPT(\bar{X})$ measures the penalty paid for serving the tasks in a predetermined order. Here, the service times X_i are treated as independent identically distributed random variables. Two distributions for X_i, uniform and exponential, are considered. Bounds on the mean $ER(\bar{X})$ and on the distribution function $P[R(\bar{X}) > x]$ are obtained.

MSC:

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