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Sequential clinical scheduling with patient no-shows and general service time distributions

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Abstract

A sequential clinical scheduling method for patients with general service time distributions is developed in this paper. Patients call a medical clinic to request an appointment with their physician. During the call, the scheduler assigns the patient to an available slot in the physician's schedule. This is communicated to the patient before the call terminates and, thus, the schedule is constructed sequentially. In practice, there is very limited opportunity to adjust the schedule once the complete set of patients is known. Scheduled patients might not attend, that is, they might “no-show,” and the service times of those attending are random. A myopic scheduling algorithm with an optimal stopping criteria for this problem assuming exponential service times already exists in the literature. This work relaxes this assumption and develops numerical techniques for general service time distributions. A special case in

which service times are gamma distributed is considered and it is shown that computation is significantly reduced. Finally, exhaustive experimental results are provided along with discussions that provide insights into the practical aspects of the scheduling approach.

Keywords:

Overbooking | appointment scheduling | patient no-shows | outpatient clinics

Notes

[a] t_i is appointment time for patient i.

[b] μ and σ are the mean and standard deviation of service time.

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