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A Finite-Time Analysis of Multi-armed Bandits Problems with Kullback-Leibler Divergences

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We consider a Kullback-Leibler-based algorithm for the stochastic multi-armed bandit problem in the case of distributions with finite supports (not necessarily known beforehand), whose asymptotic regret matches the lower bound of \cite{Burnetas96}. Our contribution is to provide a finite-time analysis of this algorithm; we get bounds whose main terms are smaller than the ones of previously known algorithms with finite-time analyses (like UCB-type algorithms).

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