

LIMIT DISTRIBUTIONS OF DIFFERENCES AND QUOTIENTS OF
NON-ADJACENT k -TH RECORD VALUES

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Abstract: Let $\{Y_n^{(k)}, n \geq 1\}$ denote the sequence of k -th record values of the sequence $\{X_n, n \geq 1\}$ of i.i.d. random variables with an absolutely continuous distribution function F . Fix $r \in \mathbb{N}$. We show that, for some very broad class of distributions F , the limit distribution of the sequence

$$k(Y_{n+r}^{(k)} - Y_n^{(k)}), \quad k \geq 1,$$

is the gamma distribution with pdf

$$f_{r,\lambda}(x) = \frac{\lambda^r}{(r-1)!} x^{r-1} \exp(-\lambda x), \quad x \geq 0,$$

where $\lambda > 0$ is a parameter which depends on F . We prove the similar result for k -th lower record values $Z_n^{(k)}$. Moreover, we discuss the asymptotic behaviour of quotients of these quantities.

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