

Abstract Submitted
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Nontrivial Exponents in Record Statistics ELI BEN-NAIM, Los Alamos National Laboratory, PEARSON MILLER, Yale University — We investigate records in a growing sequence of identical and independently distributed random variables. The record equals the largest value in the sequence, and our focus is on the increment, defined as the difference between two successive records. We investigate sequences in which all increments decrease monotonically, and analyze the case where the random variables are drawn from a uniform distribution with compact support. We find that the fraction I_N of sequences that exhibit this property decays algebraically with sequence length N , namely $I_N \sim N^{-\nu}$ as $N \rightarrow \infty$, and obtain the exponent $\nu = 0.317621\dots$ using analytic methods. We also study the record distribution and the increment distribution. Whereas the former is a narrow distribution with an exponential tail, the latter is broad and has a power-law tail characterized by the exponent ν . Empirical analysis of records in the sequence of waiting times between successive earthquakes is consistent with the theoretical results.

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