

On waiting time distributions associated with compound patterns in a sequence of multi-state trials

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Abstract In this article, waiting time distributions of compound patterns are considered in terms of the generating function of the numbers of occurrences of the compound patterns. Formulae for the evaluation of the generating functions of waiting time are given, which are very effective computational tools. We provide several viewpoints on waiting time problems associated with compound patterns and develop a general workable framework for the study of the corresponding distributions. The general theory is employed for the investigation of some examples in order to illustrate how the distributions of waiting time can be derived through our theoretical results.

Keywords Compound pattern · Scan · Run · Multi-state trials · Enumeration schemes · Conditional distribution · Probability function · Probability generating function · Double generating function