

Ligia L. Cristea and Helmut Prodinger,
q-Enumeration of Up-Down Words By Number of Rises,
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Abstract

In an earlier paper, Carlitz obtained generating functions for the number of up-down permutations counting the number of rises among the “peaks”. In the present paper we study different types of random up-down words over the infinite alphabet $\{1, 2, \dots\}$, where the letters have geometric probabilities. We are interested in the probabilities of up-down words of given length to have a given number of rises on the lower level. To get explicit expressions for certain generating functions, it is not necessary to solve differential equations, as opposed to Carlitz’s treatment. Moreover, in the corresponding particular cases we regain the results found by Carlitz.