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# *Foreword*

Permutations have a remarkably rich combinatorial structure. Part of the reason for this is that a permutation of a finite set can be represented in many equivalent ways, including as a word (sequence), a function, a collection of disjoint cycles, a matrix, etc. Each of these representations suggests a host of natural invariants (or “statistics”), operations, transformations, structures, etc., that can be applied to or placed on permutations. The fundamental statistics, operations, and structures on permutations include descent set (with numerous specializations), excedance set, cycle type, records, subsequences, composition (product), partial orders, simplicial complexes, probability distributions, etc. How is the newcomer to this subject able to make sense of and sort out these bewildering possibilities? Until now it was necessary to consult a myriad of sources, from textbooks to journal articles, in order to grasp the whole picture. Now, however, Miklós Bóna has provided us with a comprehensive, engaging, and eminently readable introduction to all aspects of the combinatorics of permutations. The chapter on pattern avoidance is especially timely and gives the first systematic treatment of this fascinating and active area of research.

This book can be utilized at a variety of levels, from random samplings of the treasures therein to a comprehensive attempt to master all the material and solve all the exercises. In whatever direction the reader’s tastes lead, a thorough enjoyment and appreciation of a beautiful area of combinatorics is certain to ensue.

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