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Counting Graphs

An Introduction with Specific Interest in Phylogeny

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Counting Graphs

An Introduction with Specific Interest in Phylogeny

(Dietmar Cieslik, University of Greifswald)

The book attempts to describe the world of graph theory with emphasis on counting of specific kinds of graphs, and in particular trees. A specific focus will be given to its applications in biology, in particular, in phylogeny. It will embed questions in the context of counting graphs in general.

The book only use methods which are present in the first classes of undergraduate studies. A background in elementary set theory, mathematical logic, linear algebra, probability theory and calculus is assumed. If several facts about discrete and combinatorial mathematics are not present for the reader, the book includes an appendix with the most of the important results in short reviews. In such a restricted sense the present script can be read as an introduction into Discrete Mathematics with focus in Graph Theory. Additionally, references for further reading are given.

As an textbook the present script contains several exercises, but there are vast differences in level of these questions: a) Exercises which are straightforward from the text; b) Problems which need a longer discussion; and c) Open tasks.