q- ENUMERATION OF PERMUTATIONS
AVOIDING ADJACENT PATTERNS

By

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Abstract

This thesis is mainly concerned with the derivation of the $q-$ analogues of the exponential generating functions for permutations avoiding adjacent patterns. We investigate two topics.

Firstly, we derive the $q-$ analogues for permutations on $n$ with no $<$ -- string of length 3. For completeness, we make a generalization and obtain the $q-$ analogues for permutations on $n$ with no $<$ -- string of length $k$, for $k \geq 3$. We also derive the generating functions for permutations of length $n$ with exactly one local maximum. We then consider permutations of length $n$ avoiding three adjacent patterns simultaneously.

Finally, we consider the generating functions for permutations of length $n$ with repeated patterns. This gives rise to Olivier functions.