Asymptotic Distribution of Palindromes with Missing Digits under Digital Constraints

Mabrouk Maatoug

University of Monastir, Faculty of Sciences of Monastir.
Email address: maatougmabrouk.7@gmail.com

Abstract

In homage to Professor Christian Mauduit, and motivated by his work with Aloui and Mkaouar on the distribution of palindromes with missing digits in arithmetic progressions, this presentation aims to explore and extend these results. We generalize several results concerning the distribution in residue classes of the hereditary sum-of-digits function to the case of palindromes with missing digits, a topic closely related to combinatorial number theory. Our focus is on counting such numbers and analyzing how digit restrictions influence their structure and density. Using combinatorial and analytic methods, we provide estimates for the number of palindromes satisfying these constraints and highlight the contributions of specific subsets to the main error terms.

Keywords

Hereditary sum of digits function, missing digits, palindromes, residue classes, exponential sums, equidistribution modulo 1, power free integers.

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