Bob Bastasz
Lyndon Words of a Second-Order Recurrence,
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Abstract

The sequence of digits forming the least period of the Fibonacci sequence (mod m) is a Lyndon word. Besides (0,1), other starting sequences can form Lyndon words that have a length equal to the least period of the recurrence $d_{i+2} \equiv d_i + d_{i+1} \pmod{m}$. Let $S(p)$ be the set of all such starting sequences, where p is a prime. Properties of this set are described, including its cardinality, n, and the number, c, of different length Lyndon words formed by elements in $S(p)$. Considering the fraction of possible Lyndon words that are in $S(p)$ leads to the development of a parameter called the period index, λ, which is related to the reciprocal of the Pisano period and concisely defines the main properties of $S(p)$.