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Fibonacci numbers and decimation of binary sequences,
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Abstract

The problem of computing the number of sequences of various lengths that can be obtained by decimating a given binary sequence X^n of length n is considered. It is proven that this number is maximized iff X^n is an alternating sequence and that the maximum can be expressed in terms of the Fibonacci numbers. Some other upper bounds on this number are also determined, including another bound in terms of the Fibonacci numbers, depending on the run lengths in X^n .