

## Low-Order Recombinations of C-Finite Sequences

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One of the central open problems for C-finite sequences, that is sequences that admit a linear recurrence equation with constant coefficients, is the Skolem problem, which asks if a given sequence includes the term 0. Special instances for which an answer can be given algorithmically include the case where there exists an annihilating recurrence of order less than or equal to 4. The Skolem problem is of particular interest in program verification, as the values of loop variables in practice often describe C-finite sequences. We investigate how to combine these C-finite sequences via term-wise multiplication and addition so that the resulting sequences admit recurrences of low order. These combinations then can be used as inequality loop invariants in automatic program analysis.

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