Li, Huilan; MacHenry, Trueman
Permanents and determinants, weighted isobaric polynomials, and integer sequences. (English) Zbl 1339.11018
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Summary: In this paper we construct two types of Hessenberg matrices with the property that every weighted isobaric polynomial (WIP) appears as a determinant of one of them, and as the permanent of the other. Every integer sequence which is linearly recurrent is representable by (an evaluation of) some linearly recurrent sequence of WIPs. WIPs are symmetric polynomials written in the elementary symmetric polynomial basis. Among them are the generalized Fibonacci polynomials and the generalized Lucas polynomials, which already have these sweeping representation properties. Among the integer sequences discussed are the Chebyshev polynomials of the 2nd kind, the Stirling numbers of the 1st and 2nd kind, the Catalan numbers, and the triangular numbers, as well as all sequences which are either multiplicative arithmetic functions or additive arithmetic functions.

MSC:
11B39 Fibonacci and Lucas numbers and polynomials and generalizations
11B75 Other combinatorial number theory

Keywords:
integer sequence; isobaric polynomial; arithmetic function; multiplicative function; additive function; generalized Fibonacci polynomial; generalized Lucas polynomial

Software:
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