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2001j:33019
Böing, Harald (D-KOZU); **Koepf, Wolfram** (D-HTWK)
Algorithms for q-hypergeometric summation in computer algebra. (English summary)
Orthogonal polynomials and computer algebra.
J. Symbolic Comput. **28** (1999), *no. 6,* 777–799.
33F10 (05A19 05A30 68W30)

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References: 0 **Reference Citations: 0** **Review Citations: 0**

This implementation report describes a multibasic version of Gosper's algorithm for indefinite hypergeometric summation, a q-version of Zeilberger's algorithm for definite hypergeometric summation, and a q-version of the algorithm Hyper for finding hypergeometric solutions of recurrences with polynomial coefficients. The authors' implementation of these algorithms in Maple is discussed and illustrated with numerous examples. Gosper's algorithm is extended by considering not only polynomial but also hypergeometric series solutions of the associated equation, which might be terminating for certain values of parameters. The third-mentioned algorithm represents an improvement of the one given in [S. A. Abramov, P. Paule and M. Petkovšek, Discrete Math. **180** (1998), no. 1-3, 3–22; MR 99f:39001], in that a root z of the characteristic polynomial is skipped if zq^k has already been considered, for some integer k.
{For the entire collection see 2000k:33001}

Reviewed by *Marko Petkovšek*