A FORTRAN MULTIPLE-PRECISION ARITHMETIC PACKAGE

RICHARD P. BRENT

Abstract

A collection of ANSI Standard Fortran subroutines for performing multiple-precision floating-point arithmetic and evaluating elementary and special functions is described. The subroutines are machine independent and the precision is arbitrary, subject to storage limitations. The design of the package is discussed, some of the algorithms are described, and test results are given.

Comments

Only the Abstract is given here. The full paper appeared as [1] and the algorithm appeared as [2]. For related work see [3, 4, 5].

References

[1] R. P. Brent, "A Fortran multiple-precision arithmetic package", *ACM Transactions on Mathematical Software* 4 (1978), 57–70. CR 20#34962. Also appeared as a Technical Report, Department of Computer Science, Carnegie-Mellon University (May 1976), 29 pp. rpb042.

[2] R. P. Brent, "Algorithm 524: MP, a Fortran multiple-precision arithmetic package", *ACM Transactions on Mathematical Software* 4 (1978), 71–81. rpb043.

[3] R. P. Brent, "Remark on Algorithm 524", *ACM Transactions on Mathematical Software* 5 (1979), 518–519. rpb043r.

[4] R. P. Brent, "Unrestricted algorithms for elementary and special functions", in *Information Processing 80* (edited by S. H. Lavington), North-Holland, Amsterdam, 1980, 613–619. CR 22#38728, MR 81i:68009. rpb052.

[5] R. P. Brent, J. A. Hooper and J. M. Yohe, "An Augment interface for Brent's multiple-precision arithmetic package" *ACM Transactions on Mathematical Software* 6 (1980), 146–149. CR 21#36520, Zbl 433.68028. A longer version appeared as Technical Summary Report #1868, Mathematics Research Center, University of Wisconsin, Madison (August 1978), 26 pp. rpb054.

Computer Centre, Australian National University, Canberra, Australia