GAMS Index for the NAG Fortran 77 Library

This index classifies NAG Fortran 77 Library routines according to Version 2 of the GAMS classification scheme described in [1]. Note that only those GAMS classes which contain Library routines, either directly or in a subclass, are included below.

A Arithmetic, error analysis
A3 Real
A3a Standard precision
`F06BLF` Compute quotient of two real scalars, with overflow flag
A4 Complex
A4a Standard precision
`A02ABF` Modulus of complex number
`A02ACF` Quotient of two complex numbers
`F06CLF` Compute quotient of two complex scalars, with overflow flag
A7 Sequences (e.g., convergence acceleration)
`C06BAF` Acceleration of convergence of sequence, Shanks' transformation and epsilon algorithm
C Elementary and special functions (*search also class L5*)
C1 Integer-valued functions (e.g., factorial, binomial coefficient, permutations, combinations, floor, ceiling)
C2 Powers, roots, reciprocals
`A02AAF` Square root of complex number
C3 Polynomials
C3a Orthogonal
C3a2 Chebyshev, Legendre
`C06DBF` Sum of a Chebyshev series
`E02AEF` Evaluation of fitted polynomial in one variable from Chebyshev series form (simplified parameter list)
`E02AHF` Derivative of fitted polynomial in Chebyshev series form
`E02AJF` Integral of fitted polynomial in Chebyshev series form
`E02AKF` Evaluation of fitted polynomial in one variable from Chebyshev series form
C4 Elementary transcendental functions
C4a Trigonometric, inverse trigonometric
`F06BCF` Recover cosine and sine from given real tangent
`F06CCF` Recover cosine and sine from given complex tangent, real cosine
`F06CDF` Recover cosine and sine from given complex tangent, real sine
`S07AAF` $\tan x$
`S09AAF` $\arcsin x$
`S09ABF` $\arccos x$
C4b Exponential, logarithmic
`S01BAF` $\ln(1+x)$
`S01EAF` Complex exponential, e^z
C4c Hyperbolic, inverse hyperbolic
`S10AAF` $\tanh x$
`S10ABF` $\sinh x$
`S10ACF` $\cosh x$
`S11AAF` $\text{arctanh} x$
`S11ABF` $\text{arcsinh} x$
`S11ACF` $\text{arccosh} x$
C5 Exponential and logarithmic integrals
`S13AAF` Exponential integral $E_1(x)$
C6 Cosine and sine integrals
`S13ACF` Cosine integral $\text{Ci}(x)$
`S13ADF` Sine integral $\text{Si}(x)$
C7 Gamma
C7a Gamma, log gamma, reciprocal gamma
`S14AAF` Gamma function
`S14ABF` Log Gamma function
C7c Psi function
`S14ACF` $\psi(x) - \ln x$
`S14ADF` Scaled derivatives of $\psi(x)$
C7e Incomplete gamma
`S14BAF` Incomplete Gamma functions $P(a,x)$ and $Q(a,x)$
C8 Error functions
C8a Error functions, their inverses, integrals, including the normal distribution function
`S15ABF` Cumulative normal distribution function $P(x)$
`S15ACF` Complement of cumulative normal distribution function $Q(x)$
`S15ADF` Complement of error function $\text{erfc}(x)$
`S15AEF` Error function $\text{erf}(x)$
`S15DDF` Scaled complex complement of error function, $\exp(-z^2)\text{erfc}(-iz)$

H2b Multidimensional integrals
H2b1 One or more hyper-rectangular regions (includes iterated integrals)
H2b1a Integrand available via user-defined procedure
H2b1a1 Automatic (user need only specify required accuracy)
`D01DAF` Two-dimensional quadrature, finite region
`D01EAF` Multi-dimensional adaptive quadrature over hyper-rectangle, multiple integrands
`D01FCF` Multi-dimensional adaptive quadrature over hyper-rectangle
`D01GBF` Multi-dimensional quadrature over hyper-rectangle, Monte Carlo method
H2b1a2 Nonautomatic
`D01FBF` Multi-dimensional Gaussian quadrature over hyper-rectangle
`D01FDF` Multi-dimensional quadrature, Sag–Szekeres method, general product region or n-sphere
`D01GCF` Multi-dimensional quadrature, general product region, number-theoretic method
`D01GDF` Multi-dimensional quadrature, general product region, number-theoretic method, variant of D01GCF efficient on vector machines
H2b2 n-dimensional quadrature on a nonrectangular region
H2b2a Integrand available via user-defined procedure
H2b2a1 Automatic (user need only specify required accuracy)
`D01JAF` Multi-dimensional quadrature over an n-sphere, allowing for badly-behaved integrands
H2b2a2 Nonautomatic
`D01PAF` Multi-dimensional quadrature over an n-simplex
H2c Service routines (e.g., compute weights and nodes for quadrature formulas)
`D01BBF` Pre-computed weights and abscissae for Gaussian quadrature rules, restricted choice of rule
`D01BCF` Calculation of weights and abscissae for Gaussian quadrature rules, general choice of rule
`D01GYF` Korobov optimal coefficients for use in D01GCF or D01GDF, when number of points is prime
`D01GZF` Korobov optimal coefficients for use in D01GCF or D01GDF, when number of points is product of two primes
I Differential and integral equations
I1 Ordinary differential equations (ODE's)
I1a Initial value problems
I1a1 General, nonstiff or mildly stiff
I1a1a One-step methods (e.g., Runge–Kutta)
`D02BGF` ODEs, IVP, Runge–Kutta–Merson method, until a component attains given value (simple driver)
`D02BHF` ODEs, IVP, Runge–Kutta–Merson method, until function of solution is zero (simple driver)
`D02BJF` ODEs, IVP, Runge–Kutta method, until function of solution is zero, integration over range with intermediate output (simple driver)
`D02LAF` Second-order ODEs, IVP, Runge–Kutta–Nystrom method
`D02PCF` ODEs, IVP, Runge–Kutta method, integration over range with output
`D02PDF` ODEs, IVP, Runge–Kutta method, integration over one step
I1a1b Multistep methods (e.g., Adams predictor-corrector)
`D02CJF` ODEs, IVP, Adams method, until function of solution is zero, intermediate output (simple driver)
`D02QFF` ODEs, IVP, Adams method with root-finding (forward communication, comprehensive)
`D02QGF` ODEs, IVP, Adams method with root-finding (reverse communication, comprehensive)
I1a2 Stiff and mixed algebraic- differential equations
`D02EJF` ODEs, stiff IVP, BDF method, until function of solution is zero, intermediate output (simple driver)
`D02NBF` Explicit ODEs, stiff IVP, full Jacobian (comprehensive)
`D02NCF` Explicit ODEs, stiff IVP, banded Jacobian (comprehensive)
`D02NDF` Explicit ODEs, stiff IVP, sparse Jacobian (comprehensive)
`D02NGF` Implicit/algebraic ODEs, stiff IVP, full Jacobian (comprehensive)
`D02NHF` Implicit/algebraic ODEs, stiff IVP, banded Jacobian (comprehensive)
`D02NJF` Implicit/algebraic ODEs, stiff IVP, sparse Jacobian (comprehensive)
`D02NMF` Explicit ODEs, stiff IVP (reverse communication, comprehensive)
`D02NNF` Implicit/algebraic ODEs, stiff IVP (reverse communication, comprehensive)
`D03PKF` General system of first-order PDEs, coupled DAEs, method of lines, Keller box discretisation, one space variable
`D03PPF` General system of parabolic PDEs, coupled DAEs, method of lines, finite differences, remeshing, one space variable
`D03PRF` General system of first-order PDEs, coupled DAEs, method of lines, Keller box discretisation, remeshing, one space variable
I1b Multipoint boundary value problems
I1b1 Linear
`D02GBF` ODEs, boundary value problem, finite difference technique with deferred correction, general linear problem

References

[1] Boisvert R F, Howe S E and Kahaner D K (1990) The guide to available mathematical software problem classification scheme. *Report NISTIR 4475* Applied and Computational Mathematics Division, National Institute of Standards and Technology.

[2] Boisvert R F, Howe S E and Kahaner D K (1985) GAMS — a framework for the management of scientific software. *ACM Trans. Math. Software* **11** 313–355.

[3] Boisvert R F (1989) The guide to available mathematical software advisory system. *Math. Comput. Simul.* **31** 453–464.