NAG Fortran Library Chapter Contents

D03 – Partial Differential Equations

Note: please refer to the Users' Note for your implementation to check that a routine is available.

D03 Chapter Introduction

Routine Name	Mark of Introduction	Purpose
D03EAF	7	Elliptic PDE, Laplace's equation, two-dimensional arbitrary domain
D03EBF	7	Elliptic PDE, solution of finite difference equations by SIP, five-point two-dimensional molecule, iterate to convergence
D03ECF	8	Elliptic PDE, solution of finite difference equations by SIP for seven-point three-dimensional molecule, iterate to convergence
D03EDF	12	Elliptic PDE, solution of finite difference equations by a multigrid technique
D03EEF	13	Discretize a second-order elliptic PDE on a rectangle
D03FAF	14	Elliptic PDE, Helmholtz equation, three-dimensional Cartesian co-ordinates
D03MAF	7	Triangulation of plane region
D03NCF	20	Finite difference solution of the Black–Scholes equations
D03NDF	20	Analytic solution of the Black–Scholes equations
D03NEF	20	Compute average values for D03NDF
D03PCA	20	General system of parabolic PDEs, method of lines, finite differences, one space variable (thread safe)
D03PCF	15	General system of parabolic PDEs, method of lines, finite differences, one space variable
D03PDA	20	General system of parabolic PDEs, method of lines, Chebyshev C^0 collocation, one space variable (thread safe)
D03PDF	15	General system of parabolic PDEs, method of lines, Chebyshev C^0 collocation, one space variable
D03PEF	16	General system of first-order PDEs, method of lines, Keller box discretisation, one space variable
D03PFF	17	General system of convection-diffusion PDEs with source terms in conservative form, method of lines, upwind scheme using numerical flux function based on Riemann solver, one space variable
D03PHA	20	General system of parabolic PDEs, coupled DAEs, method of lines, finite differences, one space variable (thread safe)
D03PHF	15	General system of parabolic PDEs, coupled DAEs, method of lines, finite differences, one space variable
D03PJA	20	General system of parabolic PDEs, coupled DAEs, method of lines, Chebyshev C^0 collocation, one space variable (thread safe)
D03PJF	15	General system of parabolic PDEs, coupled DAEs, method of lines, Chebyshev C^0 collocation, one space variable
D03PKF	16	General system of first-order PDEs, coupled DAEs, method of lines, Keller box discretisation, one space variable
D03PLF	17	General system of convection-diffusion PDEs with source terms in conservative form, coupled DAEs, method of lines, upwind scheme using numerical flux function based on Riemann solver, one space variable
D03PPA	20	General system of parabolic PDEs, coupled DAEs, method of lines, finite differences, remeshing, one space variable (thread safe)
D03PPF	16	General system of parabolic PDEs, coupled DAEs, method of lines, finite differences, remeshing, one space variable
D03PRF	16	General system of first-order PDEs, coupled DAEs, method of lines, Keller box discretisation, remeshing, one space variable

D03PSF	17	General system of convection-diffusion PDEs with source terms in conservative form, coupled DAEs, method of lines, upwind scheme using numerical flux function based on Riemann solver, remeshing, one space variable
D03PUF	17	Roe's approximate Riemann solver for Euler equations in conservative form, for use with D03PFF, D03PLF and D03PSF
D03PVF	17	Osher's approximate Riemann solver for Euler equations in conservative form, for use with D03PFF, D03PLF and D03PSF
D03PWF	18	Modified HLL Riemann solver for Euler equations in conservative form, for use with D03PFF, D03PLF and D03PSF
D03PXF	18	Exact Riemann Solver for Euler equations in conservative form, for use with D03PFF, D03PLF and D03PSF
D03PYF	15	PDEs, spatial interpolation with D03PDF/D03PDA or D03PJF/D03PJA
D03PZF	15	PDEs, spatial interpolation with D03PCF/D03PCA, D03PEF, D03PFF, D03PHF/D03PHA, D03PKF, D03PLF, D03PPF/D03PPA, D03PRF or D03PSF
D03RAF	18	General system of second-order PDEs, method of lines, finite differences, remeshing, two space variables, rectangular region
D03RBF	18	General system of second-order PDEs, method of lines, finite differences, remeshing, two space variables, rectilinear region
D03RYF	18	Check initial grid data in D03RBF
D03RZF	18	Extract grid data from D03RBF
D03UAF	7	Elliptic PDE, solution of finite difference equations by SIP, five-point two-dimensional molecule, one iteration
D03UBF	8	Elliptic PDE, solution of finite difference equations by SIP, seven-point three-dimensional molecule, one iteration