

NAG Library Chapter Contents

D02 – Ordinary Differential Equations

D02 Chapter Introduction

D02M–N Sub-chapter Introduction

Routine Name	Mark of Introduction	Purpose
D02AGF	2	Ordinary differential equations, boundary value problem, shooting and matching technique, allowing interior matching point, general parameters to be determined
D02BGF	7	Ordinary differential equations, initial value problem, Runge–Kutta–Merson method, until a component attains given value (simple driver)
D02BHF	7	Ordinary differential equations, initial value problem, Runge–Kutta–Merson method, until function of solution is zero (simple driver)
D02BJF	18	Ordinary differential equations, initial value problem, Runge–Kutta method, until function of solution is zero, integration over range with intermediate output (simple driver)
D02CJF	13	Ordinary differential equations, initial value problem, Adams method, until function of solution is zero, intermediate output (simple driver)
D02EJF	12	Ordinary differential equations, stiff initial value problem, backward differential formulae method, until function of solution is zero, intermediate output (simple driver)
D02GAF	8	Ordinary differential equations, boundary value problem, finite difference technique with deferred correction, simple nonlinear problem
D02GBF	8	Ordinary differential equations, boundary value problem, finite difference technique with deferred correction, general linear problem
D02HAF	8	Ordinary differential equations, boundary value problem, shooting and matching, boundary values to be determined
D02HBF	8	Ordinary differential equations, boundary value problem, shooting and matching, general parameters to be determined
D02JAF	8	Ordinary differential equations, boundary value problem, collocation and least-squares, single n th-order linear equation
D02JBF	8	Ordinary differential equations, boundary value problem, collocation and least-squares, system of first-order linear equations
D02KAF	7	Second-order Sturm–Liouville problem, regular system, finite range, eigenvalue only
D02KDF	7	Second-order Sturm–Liouville problem, regular/singular system, finite/infinite range, eigenvalue only, user-specified break-points
D02KEF	8	Second-order Sturm–Liouville problem, regular/singular system, finite/infinite range, eigenvalue and eigenfunction, user-specified break-points
D02LAF	13	Second-order ordinary differential equations, initial value problem, Runge–Kutta–Nystrom method
D02LXF	13	Second-order ordinary differential equations, initial value problem, setup for D02LAF

D02LYF	13	Second-order ordinary differential equations, initial value problem, diagnostics for D02LAF
D02LZF	13	Second-order ordinary differential equations, initial value problem, interpolation for D02LAF
D02MCF	22	Implicit ordinary differential equations/DAEs, initial value problem, DASSL method continuation for D02NEF
D02MVF	14	Ordinary differential equations, initial value problem, DASSL method, setup for D02M–N routines
D02MWF	22	Implicit ordinary differential equations/DAEs, initial value problem, setup for D02NEF
D02MZF	14	Ordinary differential equations, initial value problem, interpolation for D02M–N routines, natural interpolant
D02NBF	12	Explicit ordinary differential equations, stiff initial value problem, full Jacobian (comprehensive)
D02NCF	12	Explicit ordinary differential equations, stiff initial value problem, banded Jacobian (comprehensive)
D02NDF	12	Explicit ordinary differential equations, stiff initial value problem, sparse Jacobian (comprehensive)
D02NEF	22	Implicit ordinary differential equations/DAEs, initial value problem, DASSL method integrator
D02NGF	12	Implicit/algebraic ordinary differential equations, stiff initial value problem, full Jacobian (comprehensive)
D02NHF	12	Implicit/algebraic ordinary differential equations, stiff initial value problem, banded Jacobian (comprehensive)
D02NJF	12	Implicit/algebraic ordinary differential equations, stiff initial value problem, sparse Jacobian (comprehensive)
D02NMF	12	Explicit ordinary differential equations, stiff initial value problem (reverse communication, comprehensive)
D02NNF	12	Implicit/algebraic ordinary differential equations, stiff initial value problem (reverse communication, comprehensive)
D02NPF	22	Implicit ordinary differential equations/DAEs, initial value problem linear algebra setup routine for D02NEF
D02NRF	12	Ordinary differential equations, initial value problem, for use with D02M–N routines, sparse Jacobian, enquiry routine
D02NSF	12	Ordinary differential equations, initial value problem, for use with D02M–N routines, full Jacobian, linear algebra set up
D02NTF	12	Ordinary differential equations, initial value problem, for use with D02M–N routines, banded Jacobian, linear algebra set up
D02NUF	12	Ordinary differential equations, initial value problem, for use with D02M–N routines, sparse Jacobian, linear algebra set up
D02NVF	12	Ordinary differential equations, initial value problem, backward differential formulae method, setup for D02M–N routines
D02NWF	12	Ordinary differential equations, initial value problem, Blend method, setup for D02M–N routines
D02NXF	12	Ordinary differential equations, initial value problem, sparse Jacobian, linear algebra diagnostics, for use with D02M–N routines

D02NYF	12	Ordinary differential equations, initial value problem, integrator diagnostics, for use with D02M–N routines
D02NZF	12	Ordinary differential equations, initial value problem, setup for continuation calls to integrator, for use with D02M–N routines
D02PCF	16	Ordinary differential equations, initial value problem, Runge–Kutta method, integration over range with output
D02PDF	16	Ordinary differential equations, initial value problem, Runge–Kutta method, integration over one step
D02PVF	16	Ordinary differential equations, initial value problem, setup for D02PCF and D02PDF
D02PWF	16	Ordinary differential equations, initial value problem, resets end of range for D02PDF
D02PXF	16	Ordinary differential equations, initial value problem, interpolation for D02PDF
D02PYF	16	Ordinary differential equations, initial value problem, integration diagnostics for D02PCF and D02PDF
D02PZF	16	Ordinary differential equations, initial value problem, error assessment diagnostics for D02PCF and D02PDF
D02QFF	13	Ordinary differential equations, initial value problem, Adams method with root-finding (forward communication, comprehensive)
D02QGF	13	Ordinary differential equations, initial value problem, Adams method with root-finding (reverse communication, comprehensive)
D02QWF	13	Ordinary differential equations, initial value problem, setup for D02QFF and D02QGF
D02QXF	13	Ordinary differential equations, initial value problem, diagnostics for D02QFF and D02QGF
D02QYF	13	Ordinary differential equations, initial value problem, root-finding diagnostics for D02QFF and D02QGF
D02QZF	13	Ordinary differential equations, initial value problem, interpolation for D02QFF or D02QGF
D02RAF	8	Ordinary differential equations, general nonlinear boundary value problem, finite difference technique with deferred correction, continuation facility
D02SAF	8	Ordinary differential equations, boundary value problem, shooting and matching technique, subject to extra algebraic equations, general parameters to be determined
D02TGF	8	n th-order linear ordinary differential equations, boundary value problem, collocation and least-squares
D02TKF	17	Ordinary differential equations, general nonlinear boundary value problem, collocation technique
D02TVF	17	Ordinary differential equations, general nonlinear boundary value problem, setup for D02TKF
D02TXF	17	Ordinary differential equations, general nonlinear boundary value problem, continuation facility for D02TKF
D02TYF	17	Ordinary differential equations, general nonlinear boundary value problem, interpolation for D02TKF
D02TZF	17	Ordinary differential equations, general nonlinear boundary value problem, diagnostics for D02TKF

D02XJF	12	Ordinary differential equations, initial value problem, interpolation for D02M–N routines, natural interpolant
D02XKF	12	Ordinary differential equations, initial value problem, interpolation for D02M–N routines, C_1 interpolant
D02ZAF	12	Ordinary differential equations, initial value problem, weighted norm of local error estimate for D02M–N routines
