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Chapter 1: Utilities

Module 1.1: nag_lib_support Library Support Facilities

nag_lib_ident	Prints details of the Library implementation
nag_deallocate	Deallocates storage from structures with types defined by the
	Library

Module 1.2: nag_error_handling Error Handling

nag_set_error	Controls how errors are to be handled by the Library
nag_error	Communicates information about error handling between a user's
	program and the Library (type)

Module 1.3: nag_write_mat Matrix Printing

nag_write_gen_mat	Writes a real, complex or integer general matrix
nag_write_tri_mat	Writes a real or complex triangular matrix
nag_write_bnd_mat	Writes a real or complex band matrix

Module 1.4: nag_sort Sorting

nag_sort_vec	Sorts a vector of numeric or character data into ascending or descending order
nag_rank_vec	Ranks a vector of numeric or character data in ascending or descending order
nag_reorder_vec	Reorders a vector of numeric or character data into the order specified by a vector of ranks
nag_rank_mat	Ranks the rows or columns of a matrix of integer or real numbers in ascending or descending order
nag_rank_arb_data	Ranks arbitrary data according to a user-supplied comparison procedure
nag_invert_perm	Inverts a permutation, thus converts a rank vector to an index vector, or vice versa
nag_check_perm	Checks the validity of a permutation
nag_decomp_perm	Decomposes a permutation into cycles, as an aid to reordering ranked data

Module 1.5: nag_math_constants Mathematical Constants

nag_pi	Returns an approximation to π
nag_euler_constant	Returns an approximation to γ (Euler's constant)

Chapter 3: Special Functions

Module 3.1: nag_inv_hyp_fun Inverse Hyperbolic Functions

nag_arctanh	Inverse hyperbolic tangent, $\operatorname{arctanh} x$
nag_arcsinh	Inverse hyperbolic sine, $\operatorname{arcsinh} x$
nag_arccosh	Inverse hyperbolic cosine, $\operatorname{arccosh} x$

Module 3.2: nag_gamma_fun Gamma Functions

nag_gamma	Gamma function
nag_log_gamma	Log gamma function
nag_polygamma	Polygamma functions
nag_incompl_gamma	Incomplete gamma functions

Module 3.3: nag_err_fun Error Functions

nag_erf	Error function $\operatorname{erf} x$
nag_erfc	Complementary error function $\operatorname{erfc} x$
nag_dawson	Dawson's integral $F(x)$

Module 3.4: nag_bessel_fun Bessel Functions

nag_bessel_j0	Bessel function $J_0(x)$
nag_bessel_j1	Bessel function $J_1(x)$
nag_bessel_j	Bessel function $J_{\nu}(z)$
nag_bessel_y0	Bessel function $Y_0(x)$
nag_bessel_y1	Bessel function $Y_1(x)$
nag_bessel_y	Bessel function $Y_{\nu}(z)$
nag_bessel_i0	Modified Bessel function $I_0(x)$
nag_bessel_i1	Modified Bessel function $I_1(x)$
nag_bessel_i	Modified Bessel function $I_{\nu}(z)$
nag_bessel_k0	Modified Bessel function $K_0(x)$
nag_bessel_k1	Modified Bessel function $K_1(x)$
nag_bessel_k	Modified Bessel function $K_{\nu}(z)$

Module 3.5: nag_fresnel_intg Fresnel Integrals

nag_fresnel_s	Fresnel integral $S(x)$
nag_fresnel_c	Fresnel integral $C(x)$

Module 3.6: nag_ell_intg Elliptic Integrals

nag_ell_rf	Symmetrised elliptic integral of the first kind
nag_ell_rc	Degenerate form of elliptic integral of the first kind
nag_ell_rd	Symmetrised elliptic integral of the second kind
nag_ell_rj	Symmetrised elliptic integral of the third kind

Module 3.7: nag_ell_fun Elliptic Functions

nag_ell_jac	Jacobian elliptic functions sn, cn and dn
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Module 3.8: nag_airy_fun Airy Functions

nag_airy_ai	Airy function $\operatorname{Ai}(z)$
nag_airy_bi	Airy function $\operatorname{Bi}(z)$

Module 3.9: nag_kelvin_fun Kelvin Functions

nag_kelvin_ber	Kelvin function	ber x
nag_kelvin_bei	Kelvin function	bei x
nag_kelvin_ker	Kelvin function	$\ker x$
nag_kelvin_kei	Kelvin function	$\mathrm{kei}\;x$

Chapter 4: Matrix and Vector Operations

Module 4.1: nag_mat_norm Norms of a Matrix

nag_gen_mat_norm	Computes a norm, or the element of largest absolute value, of a general real or complex matrix
nag_gen_bnd_mat_norm	Computes a norm, or the element of largest absolute value, of a real or complex square banded matrix
nag_sym_mat_norm	Computes a norm, or the element of largest absolute value, of a real or complex, symmetric or Hermitian matrix, stored in conventional or packed storage
nag_sym_bnd_mat_norm	Computes a norm, or the element of largest absolute value, of a real or complex, symmetric or Hermitian band matrix
nag_trap_mat_norm	Computes a norm, or the element of largest absolute value, of a real or complex trapezoidal matrix
nag_tri_mat_norm	Computes a norm, or the element of largest absolute value, of a real or complex triangular matrix, stored in conventional or packed storage
nag_tri_bnd_mat_norm	Computes a norm, or the element of largest absolute value, of a real or complex triangular band matrix
nag_hessen_mat_norm	Computes a norm, or the element of largest absolute value, of a real or complex upper Hessenberg matrix

Chapter 5: Linear Equations

Module 5.1: nag_gen_lin_sys General Systems of Linear Equations

nag_gen_lin_sol	Solves a general real or complex system of linear equations with one or many right-hand sides
nag_gen_lin_fac	Performs an LU factorization of a general real or complex matrix
nag_gen_lin_sol_fac	Solves a general real or complex system of linear equations, with coefficient matrix previously factorized by nag_gen_lin_fac

Module 5.2: nag_sym_lin_sys Symmetric Systems of Linear Equations

nag_sym_lin_sol	Solves a real or complex, symmetric or Hermitian system of linear equations with one or many right-hand sides
nag_sym_lin_fac	Performs a Cholesky or Bunch–Kaufman factorization of a real
	or complex, symmetric or Hermitian matrix
nag_sym_lin_sol_fac	Solves a real or complex, symmetric or Hermitian system of
	linear equations, with coefficient matrix previously factorized by
	nag_sym_lin_fac

Module 5.3: nag_tri_lin_sys **Triangular Systems of Linear Equations**

nag_tri_lin_sol	Solves a real or complex triangular system of linear equations
nag_tri_lin_cond	Estimates the condition number of a real or complex triangular
	matrix
nag_tri_mat_det	Evaluates the determinant of a real or complex triangular matrix

Module 5.4: nag_gen_bnd_lin_sys General Banded Systems of Linear Equations

nag_gen_bnd_lin_sol	Solves a general real or complex banded system of linear equations, with one or many right-hand sides
nag_gen_bnd_lin_fac	Performs an LU factorization of a general real or complex band matrix
nag_gen_bnd_lin_sol_fac	Solves a general real or complex banded system of linear equations, with coefficient matrix previously factorized by nag_gen_bnd_lin_fac

Module 5.5: nag_sym_bnd_lin_sys

Symmetric Banded Systems of Linear Equations

nag_sym_bnd_lin_sol	Solves a real symmetric or complex Hermitian positive definite
	banded system of linear equations, with one or many right-hand
	sides
nag_sym_bnd_lin_fac	Performs a Cholesky factorization of a real symmetric or complex
	Hermitian positive definite band matrix
nag_sym_bnd_lin_sol_fac	Solves a real symmetric or complex Hermitian positive definite
	banded system of linear equations, with coefficient matrix
	previously factorized by nag_sym_bnd_lin_fac

Chapter 6: Eigenvalue and Least-squares Problems

Module 6.1: nag_sym_eig

Standard Symmetric Eigenvalue Problems

nag_sym_eig_all	All eigenvalues, and optionally eigenvectors, of a real symmetric or complex Hermitian matrix
nag_sym_eig_sel	Selected eigenvalues, and optionally the corresponding eigenvectors, of a real symmetric or complex Hermitian matrix
nag_sym_tridiag_reduc	Reduction of a real symmetric or complex Hermitian matrix to real symmetric tridiagonal form
nag_sym_tridiag_orth	Form or apply the transformation matrix determined by nag_sym_tridiag_reduc
nag_sym_tridiag_eig_all	All eigenvalues, and optionally eigenvectors, of a real symmetric tridiagonal matrix
nag_sym_tridiag_eig_val nag_sym_tridiag_eig_vec	Selected eigenvalues of a real symmetric tridiagonal matrix Selected eigenvectors of a real symmetric tridiagonal matrix

Module 6.2: nag_nsym_eig Standard Nonsymm otric Eic

modulo	0.5
Standard	Nonsymmetric Eigenvalue Problems

nag_nsym_eig_all	All eigenvalues, and optionally eigenvectors, of a general real or
	complex matrix
nag_schur_fac	Schur factorization of a general real or complex matrix

Module 6.3: nag_svd Singular Value Decomposition (SVD)

nag_gen_svd	Singular value decomposition of a general real or complex matrix
nag_gen_bidiag_reduc	Reduction of a general real or complex matrix to real bidiagonal form
nag_bidiag_svd	Singular value decomposition of a real bidiagonal matrix

Module 6.4: nag_lin_lsq Linear Least-squares Problems

nag_lin_lsq_sol nag_lin_lsq_sol_svd	Solves a real or complex linear least-squares problem Solves a real or complex linear least-squares problem, assuming that a singular value decomposition of the coefficient matrix has
	already been computed
nag_qr_fac	QR factorization of a general real or complex matrix
nag_qr_orth	Form or apply the matrix Q determined by nag_qr_fac
nag_lin_lsq_sol_qr	Solves a real or complex linear least-squares problem, assuming
	that the QR factorization of the coefficient matrix has already
	been computed
nag_lin_lsq_sol_qr_svd	Solves a real or complex linear least-squares problem using the
	SVD, assuming that the QR factorization of the coefficient matrix
	has already been computed

Module 6.5: nag_sym_gen_eig Symmetric-definite Generalized Eigenvalue Problems

nag_sym_gen_eig_all	All eigenvalues, a definite or comp	and optionally eigenvect plex Hermitian-definite	ors, of a real s generalized	symmetric- eigenvalue
	problem			
nag_sym_gen_eig_sel	Selected	eigenvalues,	and	optionally
	the corresponding	ng eigenvectors, of a re	al symmetric-	definite or
	complex Hermiti	an-definite generalized	eigenvalue pro	blem

Module 6.6: nag_nsym_gen_eig Nonsymmetric Generalized Eigenvalue Problems

nag_nsym_gen_eig_all	All eigenvalues, and optionally eigenvectors, of a real or complex
	nonsymmetric generalized eigenvalue problem
nag_gen_schur_fac	Generalized Schur factorization of a real or complex matrix pencil $% \mathcal{A}$

Chapter 7: Transforms

Module 7.1: nag_fft Discrete Fourier Transforms

nag_fft_1d	Single or multiple 1-d complex discrete Fourier transform, or its
nag_fft_1d_real	Single or multiple 1-d real or Hermitian discrete Fourier
nag_fft_1d_basic	Single or multiple 1-d real, Hermitian or complex discrete Fourier transform. The transform is overwritten on the input data

nag_fft_2d nag_fft_2d_basic	2-d complex discrete Fourier transform, or its inverse2-d complex discrete Fourier transform. The transform is overwritten on the input data
nag_fft_3d	3-d complex discrete Fourier transform, or its inverse
nag_fft_3d_basic	3-d complex discrete Fourier transform. The transform is overwritten on the input data
nag_fft_trig	Trigonometric coefficients for computing discrete Fourier transforms
nag_herm_to_cmplx	Convert Hermitian sequences to general complex sequences
nag_cmplx_to_herm	Convert Hermitian complex sequences to their compact real form
nag_conj_herm	Complex conjugates of Hermitian sequences

Module 7.2: nag_sym_fft Symmetric Discrete Fourier Transforms

nag_fft_sin nag_fft_cos	Single or multiple 1-d discrete Fourier sine transform Single or multiple 1-d discrete Fourier cosine transform
nag_fft_qtr_sin	Single or multiple 1-d discrete quarter-wave Fourier sine
nag_fft_qtr_cos	Single or multiple 1-d discrete quarter-wave Fourier cosine transform, or its inverse

Module 7.3: nag_conv

Convolution and Correlation

nag_fft_conv

Computes the convolution or correlation of two real or complex vectors

Chapter 8: Curve and Surface Fitting

Module 8.1: nag_pch_interp Piecewise Cubic Hermite Interpolation

Generates a monotonicity-preserving piecewise cubic Hermite interpolant
Computes values and optionally derivatives of a piecewise cubic
Hermite interpolant
Computes the definite integral of a piecewise cubic Hermite
interpolant
Extracts details of a piecewise cubic Hermite interpolant from a
structure of type nag_pch_comm_wp
Represents a piecewise cubic Hermite interpolant (type)

Module 8.2: nag_spline_1d One-dimensional Spline Fitting

nag_spline_1d_auto_fit	Generates a cubic spline approximation to an arbitrary 1-d data set, with automatic knot selection
<pre>nag_spline_1d_lsq_fit</pre>	Generates a weighted least-squares cubic spline fit to an arbitrary 1-d data set, with given interior knots
nag_spline_1d_interp	Generates a cubic spline interpolant to an arbitrary 1-d data set
<pre>nag_spline_1d_eval</pre>	Computes values of a cubic spline and optionally its first three derivatives
nag_spline_1d_intg	Computes the definite integral of a cubic spline
nag_spline_1d_set	Initializes a cubic spline with given interior knots and B-spline coefficients
<pre>nag_spline_1d_extract</pre>	Extracts details of a cubic spline from a structure of type <pre>nag_spline_1d_comm_wp</pre>
$\verb"nag_spline_1d_comm_wp"$	Represents a 1-d cubic spline in B-spline series form (type)

Module 8.3: nag_spline_2d Two-dimensional Spline Fitting

<pre>nag_spline_2d_auto_fit</pre>	Generates a bicubic spline approximation to a 2-d data set, with automatic knot selection
nag_spline_2d_lsq_fit	Generates a minimal, weighted least-squares bicubic spline surface fit to a given set of data points, with given interior knots
nag_spline_2d_interp	Generates a bicubic spline interpolating surface through a set of data values, given on a rectangular grid of the xy plane
nag_spline_2d_eval	Computes values of a bicubic spline
nag_spline_2d_intg	Computes the definite integral of a bicubic spline
nag_spline_2d_set	Initializes a bicubic spline with given interior knots and B-spline coefficients
<pre>nag_spline_2d_extract</pre>	Extracts details of a bicubic spline from a structure of type <pre>nag_spline_2d_comm_wp</pre>
$\verb"nag_spline_2d_comm_wp"$	Represents a 2-d bicubic spline in B-spline series form (type)

Module 8.4: nag_scat_interp Interpolation of Scattered Data

nag_scat_2d_interp	Generates a 2-d interpolating function using a modified Shepard method
nag_scat_2d_eval	Computes values of the interpolant generated by
	nag_scat_2d_interp and its partial derivatives
nag_scat_3d_interp	Generates a 3-d interpolating function using a modified Shepard method
nag_scat_3d_eval	Computes values of the interpolant generated by
	nag_scat_3d_interp and its partial derivatives
nag_scat_2d_set	Initializes a structure of type nag_scat_comm_wp to represent a
	2-d scattered data interpolant
nag_scat_3d_set	Initializes a structure of type nag_scat_comm_wp to represent a
2	3-d scattered data interpolant
nag_scat_extract	Extracts details of a scattered data interpolant from a structure
2	of derived type nag_scat_comm_wp
nag_scat_comm_wp	Represents a scattered data interpolant generated either by
	nag_scat_2d_interp or nag_scat_3d_interp (type)

Chapter 9: Optimization

Module 9.1: nag_qp Linear and Quadratic Programming

nag_qp_sol	Solves a linear or quadratic programming problem
nag_qp_cntrl_init	Initialization procedure for nag_qp_cntrl_wp
$nag_qp_cntrl_wp$	Control parameters for nag_qp_sol (type)

Module 9.2: nag_nlin_lsq Unconstrained Nonlinear Least-squares

nag_nlin_lsq_sol	Finds an unconstrained minimum of a sum of squares
nag_nlin_lsq_cov	Computes the variance-covariance matrix for a nonlinear least-
	squares problem
nag_nlin_lsq_cntrl_init	Initialization procedure for nag_nlin_lsq_cntrl_wp
$\verb"nag_nlin_lsq_cntrl_wp"$	Control parameters for nag_nlin_lsq_sol (type)

Module 9.3: nag_nlp Nonlinear Programming

nag_nlp_sol	Solves a nonlinear programming problem
nag_nlp_cntrl_init	Initialization procedure for nag_nlp_cntrl_wp
$nag_nlp_cntrl_wp$	Control parameters for nag_nlp_sol (type)

Module 9.4: nag_con_nlin_lsq Constrained Nonlinear Least-squares

nag_con_nlin_lsq_sol	Finds a constrained minimum of a sum of squares
<pre>nag_con_nlin_lsq_cntrl_init</pre>	Initialization procedure for <code>nag_con_nlin_lsq_cntrl_wp</code>
$\verb"nag_con_nlin_lsq_cntrl_wp"$	Control parameters for nag_con_nlin_lsq_sol (type)

Chapter 10: Nonlinear Equations

Module 10.1: nag_polynom_eqn Roots of Polynomials

nag_polynom_roots Calculates the roots of a polynomial

Module 10.2: nag_nlin_eqn Roots of a Single Nonlinear Equation

nag_nlin_eqn_sol Finds a solution of a single nonlinear equation

Module 10.3: nag_nlin_sys Roots of a System of Nonlinear Equations

nag_nlin_sys_sol Finds a solution of a system of nonlinear equations

Chapter 11: Quadrature

Module 11.1: nag_quad_1d Numerical Integration over a Finite Interval

nag_quad_1d_gen	1-d quadrature, adaptive, finite interval, allowing for badly
	behaved integrand, allowing for singularities at user-specified
	break-points, suitable for oscillatory integrands
nag_quad_1d_wt_trig	1-d quadrature, adaptive, finite interval, weight function $\cos(\omega x)$ or $\sin(\omega x)$
	$\frac{1}{1} = \frac{1}{1} + \frac{1}$
nag_quad_1d_wt_end_sing	1-d quadrature, adaptive, finite interval, weight function with
	end-point singularities of algebraico-logarithmic type
nag_quad_1d_wt_hilb	1-d quadrature, adaptive, finite interval, weight function $1/(x-c)$,
	Cauchy principal value (Hilbert transform)
nag_quad_1d_data	1-d quadrature, integration of function defined by data values,
	Gill–Miller method

Module 11.2: nag_quad_1d_inf Numerical Integration over an Infinite Interval

nag_quad_1d_inf_gen	1-d quadrature, adaptive, semi-infinite or infinite interval
nag_quad_1d_inf_wt_trig	1-d quadrature, adaptive, semi-infinite interval, weight function
	$\cos(\omega x) \text{ or } \sin(\omega x)$

Module 11.3: nag_quad_md Multi-dimensional Integrals

nag_quad_md_rect nag_quad_md_rect_mintg	Multi-dimensional adaptive quadrature over a hyper-rectangle Multi-dimensional adaptive quadrature over a hyper-rectangle,
	multiple integrands
nag_quad_2d	2-d quadrature, finite region

Module 11.4: nag_quad_util Numerical Integration Utilities

nag_quad_gs_wt_absc	Calculation	of	weights	and	abscissae	for	Gaussian	quadrature
	rules, genera	al cl	hoice of a	rule				

Chapter 12: Ordinary Differential Equations

Module 12.1: nag_ivp_ode_rk

Solution of Initial Value Problems for Ordinary Differential Equations by Runge–Kutta Methods

nag_rk_setup	Sets up the integration
nag_rk_interval	Integrates across an interval and provides the solution at user-
	specified points
nag_rk_info	Provides statistics about the integration
nag_rk_global_err	Provides information about global error assessment
nag_rk_step	Integrates one step at a time
nag_rk_interp	Interpolates the solution
nag_rk_reset_end	Resets the end point of integration
$nag_rk_comm_wp$	Communicating structure for nag_ivp_ode_rk (type)

Chapter 13: Partial Differential Equations

Module 13.1: nag_pde_helm Helmholtz Equations

nag_pde_helm_3d	Solves the 3-d Helmholtz equation using a standard seven-point
	finite difference scheme and a fast Fourier transform method

Chapter 20: Statistical Distribution Functions

Module 20.1: nag_normal_dist

Probabilities and Deviate for a Normal Distribution

nag_normal_prob	Computes probabilities for various parts of a univariate Normal distribution
nag_normal_deviate	Computes the deviate associated with a given probability of a standard Normal distribution
nag_bivar_normal_prob	Computes the lower tail probability for a bivariate Normal distribution
nag_mv_normal_prob	Computes probabilities for various parts of a multivariate Normal distribution

Module 20.2: nag_t_dist Probabilities and Deviate for a Student's *t*-distribution

nag_t_prob	Computes probabilities for various parts of a Student's $t\mathchar`-$
	distribution with ν degrees of freedom
nag_t_deviate	Computes the deviate associated with a given probability of a
	Student's <i>t</i> -distribution

Module 20.3: nag_chisq_dist Probabilities and Deviate for a χ^2 -distribution

nag_chisq_prob	Computes lower or upper tail probability for a $\chi^2\text{-distribution}$
	with ν degrees of freedom
nag_chisq_deviate	Computes the deviate associated with a given lower tail probability of a χ^2 -distribution with ν degrees of freedom
	probability of a χ -distribution with ν degrees of needoli

Module 20.4: nag_f_dist Probabilities and Deviate for an *F*-distribution

nag_f_prob	Computes lower or upper tail probability for an F -distribution
	with ν_1 and ν_2 degrees of freedom
nag_f_deviate	Computes the deviate associated with a given lower tail
	probability of an $F\text{-distribution}$ with ν_1 and ν_2 degrees of freedom

Module 20.5: nag_beta_dist Probabilities and Deviate for a Beta Distribution

nag_beta_prob	Computes lower or upper tail probability for a beta distribution
	with parameters a and b
nag_beta_deviate	Computes the deviate associated with a given lower tail
	probability of a beta distribution with parameters a and b

Module 20.6: nag_gamma_dist Probabilities and Deviate for a Gamma Distribution

nag_gamma_prob	Computes	lower	or	upper	tail	probab	oility	for	a g	gamma
	distribution	n with	shap	e paran	neter a	i and sc	ale p	baram	eter	b
nag_gamma_deviate	Computes	the	deviat	te asso	ciated	l with	ag	given	lowe	er tail
	probability	of a g	amma	a distrik	oution	with sh	nape	parar	neter	a and
	scale paran	neter <i>l</i>)							

Module 20.7: nag_discrete_dist Probabilities for Discrete Distributions

nag_binom_prob	Computes lower tail, upper tail or point probability for a binomial
	distribution with parameters n and p
nag_poisson_prob	Computes lower tail, upper tail or point probability for a Poisson
	distribution with parameter λ
nag_hypergeo_prob	Computes lower tail, upper tail or point probability for a
	hypergeometric distribution with parameters $n, l, and m$

Chapter 21: Random Number Generation

Module 21.1: nag_rand_util Utilities for Random Number Generation

nag_rand_seed_set	Sets the seed used by random number generating procedures to give a repeatable or non-repeatable sequence of random numbers
nag_seed_wp	Stores data required to generate successive random numbers from a given stream (type)

Module 21.2: nag_rand_contin Random Numbers from Continuous Distributions

nag_rand_uniform	Generates random numbers from a uniform distribution over (a, b)
nag_rand_normal	Generates random numbers from a Normal distribution with mean a and standard deviation b
nag_rand_mv_normal	Generates a vector of n random numbers from a multivariate Normal distribution with mean vector a and covariance matrix ${\cal C}$
nag_rand_beta	Generates random numbers from a beta distribution with parameters $a \mbox{ and } b$
nag_rand_neg_exp	Generates random numbers from a (negative) exponential distribution with mean \boldsymbol{a}
nag_rand_gamma	Generates random numbers from a gamma distribution with parameters a and b

Module 21.3: nag_rand_discrete

Random Numbers from Discrete Distributions

nag_rand_binom	Generates random integers from a binomial distribution and/or returns a reference vector for the distribution
nag_rand_neg_binom	Generates random integers from a negative binomial distribution and/or returns a reference vector for the distribution
nag_rand_hypergeo	Generates random integers from an hypergeometric distribution and/or returns a reference vector for the distribution
nag_rand_user_dist	Generates random integers and/or returns a reference vector from a discrete distribution defined in terms of its PDF or CDF
nag_rand_ref_vec	Generates random integers from a discrete distribution, using a reference vector
nag_ref_vec_wp	Stores a reference vector which is used to generate random integers from a discrete distribution (type)

Chapter 22: Basic Descriptive Statistics

Module 22.1: nag_basic_stats Basic Descriptive Statistics for Univariate Data

nag_summary_stats_1v Computes basic descriptive statistics for univariate data

Chapter 25: Correlation and Regression Analysis

Module 25.1: nag_lin_reg Regression Analysis

<pre>nag_simple_lin_reg</pre>	Performs a simple linear regression analysis for a pair of related variables
nag_mult_lin_reg	Performs a general multiple linear regression analysis for any given predictor variables and a response variable
Module 25.2: nag_correl Correlation Analysis	

nag_prod_mom_correl	Calculates the variance-covariance matrix and the Pearson
	product-moment correlation coefficients for a set of data
nag_part_correl	Calculates the partial variance-covariance matrix and the partial
	correlation matrix from a correlation or variance covariance
	matrix

Chapter 28: Multivariate Analysis

Module 28.1: nag_fac_analysis Factor Analysis and Principal Component

nag_prin_comp	Performs principal component analysis	
Module 28.2: nag_canon_ar Canonical Analysis	alysis	
nag_canon_var	Performs canonical variate analysis	
Module 28.3: nag_mv_rotation Rotations		

rotations

Chapter 29: Time Series Analysis

Module 29.1: nag_tsa_identify Time Series Analysis – Identification

nag_orthomax

nag_tsa_acf	Calculates the sample autocorrelation function of a univariate
	time series
nag_tsa_pacf	Calculates the sample partial autocorrelation function of a
	univariate time series

Computes orthogonal rotation, using a generalized orthomax

Module 29.2: nag_tsa_kalman Kalman Filtering

nag_kalman_init	Provides an initial estimate of the Kalman filter state covariance matrix
nag_kalman_predict	Calculates a one step prediction for the square root covariance Kalman filter
nag_kalman_sqrt_cov_var nag_kalman_sqrt_cov_invar	Calculates a time-varying square root covariance Kalman filter Calculates a time-invariant square root covariance Kalman filter