

NAG Library Chapter Contents

E04 – Minimizing or Maximizing a Function

E04 Chapter Introduction – a description of the Chapter and an overview of the algorithms available

Routine Name	Mark of Introduction	Purpose
E04ABA	20	nagf_opt_one_var_func Minimum, function of one variable, using function values only
E04ABF	6	nagf_opt_one_var_func_old Minimum, function of one variable, using function values only
E04BBA	20	nagf_opt_one_var_deriv Minimum, function of one variable, using first derivative
E04BBF	6	nagf_opt_one_var_deriv_old Minimum, function of one variable, using first derivative
E04CBF	22	nagf_opt_uncon_simplex Unconstrained minimum, Nelder–Mead simplex algorithm, using function values only
E04DGA	20	nagf_opt_uncon_conjgrd_comp Unconstrained minimum, preconditioned conjugate gradient algorithm, using first derivatives (comprehensive)
E04DGF	12	nagf_opt_uncon_conjgrd_comp_old Unconstrained minimum, preconditioned conjugate gradient algorithm, using first derivatives (comprehensive)
E04DJA	20	nagf_opt_uncon_conjgrd_option_file Supply optional parameter values for E04DGF/E04DGA from external file
E04DJF	12	nagf_opt_uncon_conjgrd_option_file_old Supply optional parameter values for E04DGF/E04DGA from external file
E04DKA	20	nagf_opt_uncon_conjgrd_option_string Supply optional parameter values to E04DGF/E04DGA from a character string
E04DKF	12	nagf_opt_uncon_conjgrd_option_string_old Supply optional parameter values to E04DGF/E04DGA from a character string
E04FCF	7	nagf_opt_lsq_uncon_mod_func_comp Unconstrained minimum of a sum of squares, combined Gauss–Newton and modified Newton algorithm, using function values only (comprehensive)
E04FYF	18	nagf_opt_lsq_uncon_mod_func_easy Unconstrained minimum of a sum of squares, combined Gauss–Newton and modified Newton algorithm, using function values only (easy-to-use)
E04GBF	7	nagf_opt_lsq_uncon_quasi_deriv_comp Unconstrained minimum of a sum of squares, combined Gauss–Newton and quasi-Newton algorithm, using first derivatives (comprehensive)
E04GDF	7	nagf_opt_lsq_uncon_mod_deriv_comp Unconstrained minimum of a sum of squares, combined Gauss–Newton and modified Newton algorithm, using first derivatives (comprehensive)
E04GYF	18	nagf_opt_lsq_uncon_quasi_deriv_easy Unconstrained minimum of a sum of squares, combined Gauss–Newton and quasi-Newton algorithm, using first derivatives (easy-to-use)
E04GZF	18	nagf_opt_lsq_uncon_mod_deriv_easy Unconstrained minimum of a sum of squares, combined Gauss–Newton and modified Newton algorithm, using first derivatives (easy-to-use)
E04HCF	6	nagf_opt_check_deriv Check user's routine for calculating first derivatives of function

E04HDF	6	nagf_opt_check_deriv2 Check user's routine for calculating second derivatives of function
E04HEF	7	nagf_opt_lsq_uncon_mod_deriv2_comp Unconstrained minimum of a sum of squares, combined Gauss–Newton and modified Newton algorithm, using second derivatives (comprehensive)
E04HYF	18	nagf_opt_lsq_uncon_mod_deriv2_easy Unconstrained minimum of a sum of squares, combined Gauss–Newton and modified Newton algorithm, using second derivatives (easy-to-use)
E04JCF	23	nagf_opt_bounds_bobyqa_func Bound constrained minimum, model-based algorithm, using function values only
E04JYF	18	nagf_opt_bounds_quasi_func_easy Bound constrained minimum, quasi-Newton algorithm, using function values only (easy-to-use)
E04KDF	6	nagf_opt_bounds_mod_deriv_comp Bound constrained minimum, modified Newton algorithm, using first derivatives (comprehensive)
E04KYF	18	nagf_opt_bounds_quasi_deriv_easy Bound constrained minimum, quasi-Newton algorithm, using first derivatives (easy-to-use)
E04KZF	18	nagf_opt_bounds_mod_deriv_easy Bound constrained minimum, modified Newton algorithm, using first derivatives (easy-to-use)
E04LBF	6	nagf_opt_bounds_mod_deriv2_comp Bound constrained minimum, modified Newton algorithm, using first and second derivatives (comprehensive)
E04LYF	18	nagf_opt_bounds_mod_deriv2_easy Bound constrained minimum, modified Newton algorithm, using first and second derivatives (easy-to-use)
E04MFA	20	nagf_opt_lp_solve Linear programming (LP), dense, active-set method
E04MFF	16	nagf_opt_lp_solve_old Linear programming (LP), dense, active-set method
E04MGA	20	nagf_opt_lp_option_file Supply optional parameter values for E04MFF/E04MFA from external file
E04MGF	16	nagf_opt_lp_option_file_old Supply optional parameter values for E04MFF/E04MFA from external file
E04MHA	20	nagf_opt_lp_option_string Supply optional parameter values to E04MFF/E04MFA from a character string
E04MHF	16	nagf_opt_lp_option_string_old Supply optional parameter values to E04MFF/E04MFA from a character string
E04MWF	26	nagf_opt_miqp_mps_write Write MPS data file defining LP, QP, MILP or MIQP problem
E04MXF	24	nagf_opt_miqp_mps_read Read MPS data file defining LP, QP, MILP or MIQP problem
E04MZF	18	nagf_opt_qpconvex1_sparse_mps Read MPS data file defining LP or QP problem, deprecated
E04NCA	20	nagf_opt_lsq_lincon_solve Linear programming (LP) convex quadratic programming (QP) or linearly-constrained linear least squares problem, dense
E04NCF	12	nagf_opt_lsq_lincon_solve_old Linear programming (LP) convex quadratic programming (QP) or linearly-constrained linear least squares problem, dense
E04NDA	20	nagf_opt_lsq_lincon_option_file Supply optional parameter values for E04NCF/E04NCA from external file
E04NDF	12	nagf_opt_lsq_lincon_option_file_old Supply optional parameter values for E04NCF/E04NCA from external file

E04NEA	20	nagf_opt_lsq_lincon_option_string Supply optional parameter values to E04NCF/E04NCA from a character string
E04NEF	12	nagf_opt_lsq_lincon_option_string_old Supply optional parameter values to E04NCF/E04NCA from a character string
E04NFA	20	nagf_opt_qp_dense_solve General (possibly non-convex) quadratic programming (QP) , dense, active-set method
E04NFF	16	nagf_opt_qp_dense_solve_old General (possibly non-convex) quadratic programming (QP) , dense, active-set method
E04NGA	20	nagf_opt_qp_dense_option_file Supply optional parameter values for E04NFF/E04NFA from external file
E04NGF	16	nagf_opt_qp_dense_option_file_old Supply optional parameter values for E04NFF/E04NFA from external file
E04NHA	20	nagf_opt_qp_dense_option_string Supply optional parameter values to E04NFF/E04NFA from a character string
E04NHF	16	nagf_opt_qp_dense_option_string_old Supply optional parameter values to E04NFF/E04NFA from a character string
E04NKA	20	nagf_opt_qpconvex1_sparse_solve Linear programming (LP) or convex quadratic programming (QP), sparse, active-set method
E04NKF	18	nagf_opt_qpconvex1_sparse_solve_old Linear programming (LP) or convex quadratic programming (QP), sparse, active-set method
E04NLA	20	nagf_opt_qpconvex1_sparse_option_file Supply optional parameter values for E04NKF/E04NKA from external file
E04NLF	18	nagf_opt_qpconvex1_sparse_option_file_old Supply optional parameter values for E04NKF/E04NKA from external file
E04NMA	20	nagf_opt_qpconvex1_sparse_option_string Supply optional parameter values to E04NKF/E04NKA from a character string
E04NMF	18	nagf_opt_qpconvex1_sparse_option_string_old Supply optional parameter values to E04NKF/E04NKA from a character string
E04NPF	21	nagf_opt_qpconvex2_sparse_init Initialization routine for E04NQF
E04NQF	21	nagf_opt_qpconvex2_sparse_solve Linear programming (LP) or convex quadratic programming (QP), sparse, active-set method, recommended
E04NRF	21	nagf_opt_qpconvex2_sparse_option_file Supply optional parameter values for E04NQF from external file
E04NSF	21	nagf_opt_qpconvex2_sparse_option_string Set a single option for E04NQF from a character string
E04NTF	21	nagf_opt_qpconvex2_sparse_option_integer_set Set a single option for E04NQF from an integer argument
E04NUF	21	nagf_opt_qpconvex2_sparse_option_double_set Set a single option for E04NQF from a real argument
E04NXF	21	nagf_opt_qpconvex2_sparse_option_integer_get Get the setting of an integer valued option of E04NQF
E04NYF	21	nagf_opt_qpconvex2_sparse_option_double_get Get the setting of a real valued option of E04NQF
E04PCF	24	nagf_bnd_lin_lsq Computes the least squares solution to a set of linear equations subject to fixed upper and lower bounds on the variables. An option is provided to return a minimal length solution if a solution is not unique

E04RAF	26	<code>nagf_opt_handle_init</code> Initialization of a handle for the NAG optimization modelling suite for problems, such as, quadratic programming (QP), nonlinear programming (NLP), linear semidefinite programming (SDP) or SDP with bilinear matrix inequalities (BMI-SDP)
E04RDF	26	<code>nagf_opt_sdp_read_sdpa</code> A reader of sparse SDPA data files for linear SDP problems
E04REF	26	<code>nagf_opt_handle_set_linobj</code> Define a linear objective function to a problem initialized by E04RAF
E04RFF	26	<code>nagf_opt_handle_set_quadobj</code> Define a linear or a quadratic objective function to a problem initialized by E04RAF
E04RGF	26	<code>nagf_opt_handle_set_nlnobj</code> Define a nonlinear objective function to a problem initialized by E04RAF
E04RHF	26	<code>nagf_opt_handle_set_simplebounds</code> Define bounds of variables of a problem initialized by E04RAF
E04RJF	26	<code>nagf_opt_handle_set_linconstr</code> Define a block of linear constraints to a problem initialized by E04RAF
E04RKF	26	<code>nagf_opt_handle_set_nlnconstr</code> Define a block of nonlinear constraints to a problem initialized by E04RAF
E04RLF	26	<code>nagf_opt_handle_set_nlnhess</code> Define a structure of Hessian of the objective, constraints or the Lagrangian to a problem initialized by E04RAF
E04RNF	26	<code>nagf_opt_handle_set_linmatineq</code> Add one or more linear matrix inequality constraints to a problem initialized by E04RAF
E04RPF	26	<code>nagf_opt_handle_set_quadmatineq</code> Define bilinear matrix terms to a problem initialized by E04RAF
E04RYF	26	<code>nagf_opt_handle_print</code> Print information about a problem handle initialized by E04RAF
E04RZF	26	<code>nagf_opt_handle_free</code> Destroy the problem handle initialized by E04RAF and deallocate all the memory used
E04STF	26	<code>nagf_opt_handle_solve_ipopt</code> Run an interior point solver on a sparse nonlinear programming problem (NLP) initialized by E04RAF and defined by other routines from the suite
E04SVF	26	<code>nagf_opt_handle_solve_pennon</code> Run the Pennon solver on a compatible problem initialized by E04RAF and defined by other routines from the suite, such as, semidefinite programming (SDP) and SDP with bilinear matrix inequalities (BMI)
E04UCA	20	<code>nagf_opt_nlp1_solve</code> Nonlinear programming (NLP), dense, active-set SQP method, using function values and optionally first derivatives, recommended
E04UCF	12	<code>nagf_opt_nlp1_solve_old</code> Nonlinear programming (NLP), dense, active-set SQP method, using function values and optionally first derivatives, recommended
E04UDA	20	<code>nagf_opt_nlp1_option_file</code> Supply optional parameter values for E04UCF/E04UCA or E04UFF/E04UFA from external file
E04UDF	12	<code>nagf_opt_nlp1_option_file_old</code> Supply optional parameter values for E04UCF/E04UCA or E04UFF/E04UFA from external file
E04UEA	20	<code>nagf_opt_nlp1_option_string</code> Supply optional parameter values to E04UCF/E04UCA or E04UFF/E04UFA from a character string
E04UEF	12	<code>nagf_opt_nlp1_option_string_old</code> Supply optional parameter values to E04UCF/E04UCA or E04UFF/E04UFA from a character string

E04UFA	20	nagf_opt_nlp1_rcomm Nonlinear programming (NLP), dense, active-set, SQP method, using function values and optionally first derivatives (reverse communication, comprehensive)
E04UFF	18	nagf_opt_nlp1_rcomm_old Nonlinear programming (NLP), dense, active-set, SQP method, using function values and optionally first derivatives (reverse communication, comprehensive)
E04UGA	20	nagf_opt_nlp1_sparse_solve Nonlinear programming (NLP), sparse, active-set SQP method, using function values and optionally first derivatives
E04UGF	19	nagf_opt_nlp1_sparse_solve_old Nonlinear programming (NLP), sparse, active-set SQP method, using function values and optionally first derivatives
E04UHA	20	nagf_opt_withdraw_nlp1_sparse_option_file Supply optional parameter values for E04UGF/E04UGA from external file
E04UHF	19	nagf_opt_nlp1_sparse_option_file_old Supply optional parameter values for E04UGF/E04UGA from external file
E04UJA	20	nagf_opt_nlp1_withdraw_sparse_option_string Supply optional parameter values to E04UGF/E04UGA from a character string
E04UJF	19	nagf_opt_nlp1_sparse_option_string_old Supply optional parameter values to E04UGF/E04UGA from a character string
E04UQA	20	nagf_opt_lsq_gencon_deriv_option_file Supply optional parameter values for E04USF/E04USA from external file
E04UQF	14	nagf_opt_lsq_gencon_deriv_option_file_old Supply optional parameter values for E04USF/E04USA from external file
E04URA	20	nagf_opt_lsq_gencon_deriv_option_string Supply optional parameter values to E04USF/E04USA from a character string
E04URF	14	nagf_opt_lsq_gencon_deriv_option_string_old Supply optional parameter values to E04USF/E04USA from a character string
E04USA	20	nagf_opt_lsq_gencon_deriv Minimum of a sum of squares, nonlinear constraints, dense, active-set SQP method, using function values and optionally first derivatives
E04USF	14	nagf_opt_lsq_gencon_deriv_old Minimum of a sum of squares, nonlinear constraints, dense, active-set SQP method, using function values and optionally first derivatives
E04VGF	21	nagf_opt_nlp2_sparse_init Initialization routine for E04VHF
E04VHF	21	nagf_opt_nlp2_sparse_solve Nonlinear programming (NLP), sparse, active-set SQP method, using function values and optionally first derivatives, recommended
E04VJF	21	nagf_opt_nlp2_sparse_jacobian Determine the pattern of nonzeros in the Jacobian matrix for E04VHF
E04VKF	21	nagf_opt_nlp2_sparse_option_file Supply optional parameter values for E04VHF from external file
E04VLF	21	nagf_opt_nlp2_sparse_option_string Set a single option for E04VHF from a character string
E04VMF	21	nagf_opt_nlp2_sparse_option_integer_set Set a single option for E04VHF from an integer argument
E04VNF	21	nagf_opt_nlp2_sparse_option_double_set Set a single option for E04VHF from a real argument
E04VRF	21	nagf_opt_nlp2_sparse_option_integer_get Get the setting of an integer valued option of E04VHF
E04VSF	21	nagf_opt_nlp2_sparse_option_double_get Get the setting of a real valued option of E04VHF

E04WBF	20	nagf_opt_init Initialization routine for E04DGA, E04MFA, E04NCA, E04NFA, E04NKA, E04UCA, E04UFA, E04UGA and E04USA
E04WCF	21	nagf_opt_nlp2_init Initialization routine for E04WDF
E04WDF	21	nagf_opt_nlp2_solve Nonlinear programming (NLP), dense, active-set SQP method, using function values and optionally first derivatives
E04WEF	21	nagf_opt_nlp2_option_file Supply optional parameter values for E04WDF from external file
E04WFF	21	nagf_opt_nlp2_option_string Set a single option for E04WDF from a character string
E04WGF	21	nagf_opt_nlp2_option_integer_set Set a single option for E04WDF from an integer argument
E04WHF	21	nagf_opt_nlp2_option_double_set Set a single option for E04WDF from a real argument
E04WKF	21	nagf_opt_nlp2_option_integer_get Get the setting of an integer valued option of E04WDF
E04WLF	21	nagf_opt_nlp2_option_double_get Get the setting of a real valued option of E04WDF
E04XAA	20	nagf_opt_estimate_deriv Estimate (using numerical differentiation) gradient and/or Hessian of a function
E04XAF	12	nagf_opt_estimate_deriv_old Estimate (using numerical differentiation) gradient and/or Hessian of a function
E04YAF	7	nagf_opt_lsq_check_deriv Check user's routine for calculating Jacobian of first derivatives
E04YBF	7	nagf_opt_lsq_check_hessian Check user's routine for calculating Hessian of a sum of squares
E04YCF	11	nagf_opt_lsq_uncon_covariance Covariance matrix for nonlinear least squares problem (unconstrained)
E04ZMF	26	nagf_opt_handle_opt_set Option setting routine for the solvers from the NAG optimization modelling suite
E04ZNF	26	nagf_opt_handle_opt_get Option getting routine for the solvers from the NAG optimization modelling suite
E04ZPF	26	nagf_opt_handle_opt_set_file Option setting routine for the solvers from the NAG optimization modelling suite from external file
