

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

Function Name	Mark of Introduction	Purpose
e04abc	5	nag_opt_one_var_no_deriv Minimizes a function of one variable, using function values only
e04bbc	5	nag_opt_one_var_deriv Minimizes a function of one variable, requires first derivatives
e04cbc	9	nag_opt_simplex_easy Unconstrained minimum, Nelder–Mead simplex algorithm, using function values only
e04dgc	2	nag_opt_conj_grad Unconstrained minimization using conjugate gradients
e04fcc	2	nag_opt_lsq_no_deriv Unconstrained nonlinear least squares (no derivatives required)
e04ffc	26.1	nag_opt_handle_solve_dfls Derivative free (DFO) solver for a nonlinear least squares objective function with bounded variables
e04gbc	2	nag_opt_lsq_deriv Unconstrained nonlinear least squares (first derivatives required)
e04hcc	2	nag_opt_check_deriv Derivative checker
e04hdc	5	nag_opt_check_2nd_deriv Checks second derivatives of a user-defined function
e04jcc	23	nag_opt_bounds_qa_no_deriv Bound constrained minimum, model-based algorithm, using function values only
e04kbc	2	nag_opt_bounds_deriv Bound constrained nonlinear minimization (first derivatives required)
e04lbc	5	nag_opt_bounds_2nd_deriv Solves bound constrained problems (first and second derivatives required)
e04mfc	2	nag_opt_lp Linear programming
e04mtc	26.1	nag_opt_handle_solve_lp_ipm Linear programming (LP), sparse, interior point method (IPM)
e04mwc	26.0	nag_opt_miqp_mps_write Write MPS data file defining LP, QP, MILP or MIQP problem
e04mxc	24	nag_opt_miqp_mps_read Read MPS data file defining LP, QP, MILP or MIQP problem
e04myc	5	nag_opt_sparse_mps_free Free memory allocated by nag_opt_sparse_mps_read (e04mzc)
e04mzc	5	nag_opt_sparse_mps_read Read MPSX data for sparse LP or QP problem from a file
e04ncc	5	nag_opt_lin_lsq Solves linear least squares and convex quadratic programming problems (non-sparse)
e04nfc	2	nag_opt_qp Quadratic programming
e04nkc	5	nag_opt_sparse_convex_qp Solves sparse linear programming or convex quadratic programming problems

e04npc	8	nag_opt_sparse_convex_qp_init Initialization function for nag_opt_sparse_convex_qp_solve (e04nqc)
e04nqc	8	nag_opt_sparse_convex_qp_solve Linear programming (LP) or convex quadratic programming (QP), sparse, active-set method, recommended
e04nrc	8	nag_opt_sparse_convex_qp_option_set_file Supply optional parameter values for nag_opt_sparse_convex_qp_solve (e04nqc) from external file
e04nsc	8	nag_opt_sparse_convex_qp_option_set_string Set a single option for nag_opt_sparse_convex_qp_solve (e04nqc) from a character string
e04ntc	8	nag_opt_sparse_convex_qp_option_set_integer Set a single option for nag_opt_sparse_convex_qp_solve (e04nqc) from an integer argument
e04nuc	8	nag_opt_sparse_convex_qp_option_set_double Set a single option for nag_opt_sparse_convex_qp_solve (e04nqc) from a real argument
e04nxc	8	nag_opt_sparse_convex_qp_option_get_integer Get the setting of an integer valued option of nag_opt_sparse_convex_qp_solve (e04nqc)
e04nyc	8	nag_opt_sparse_convex_qp_option_get_double Get the setting of a real valued option of nag_opt_sparse_convex_qp_solve (e04nqc)
e04pcc	24	nag_opt_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
e04rac	26.0	nag_opt_handle_init Initialization of a handle for the NAG optimization modelling suite for problems, such as, linear programming (LP), quadratic programming (QP), nonlinear programming (NLP), least squares (LSQ) problems, linear semidefinite programming (SDP) or SDP with bilinear matrix inequalities (BMI-SDP)
e04rdc	26.0	nag_opt_sdp_read_sdpa A reader of sparse SDPA data files for linear SDP problems
e04rec	26.0	nag_opt_handle_set_linobj Define a linear objective function to a problem initialized by nag_opt_handle_init (e04rac)
e04rfc	26.0	nag_opt_handle_set_quadobj Define a linear or a quadratic objective function to a problem initialized by nag_opt_handle_init (e04rac)
e04rgc	26.0	nag_opt_handle_set_nlnobj Define a nonlinear objective function to a problem initialized by nag_opt_handle_init (e04rac)
e04rhc	26.0	nag_opt_handle_set_simplebounds Define bounds of variables of a problem initialized by nag_opt_handle_init (e04rac)
e04rjc	26.0	nag_opt_handle_set_linconstr Define a block of linear constraints to a problem initialized by nag_opt_handle_init (e04rac)
e04rkc	26.0	nag_opt_handle_set_nlnconstr Define a block of nonlinear constraints to a problem initialized by nag_opt_handle_init (e04rac)
e04rlc	26.0	nag_opt_handle_set_nlnhess Define a structure of Hessian of the objective, constraints or the Lagrangian to a problem initialized by nag_opt_handle_init (e04rac)
e04rmc	26.1	nag_opt_handle_set_nlnls Define a nonlinear least squares objective function to a problem initialized by nag_opt_handle_init (e04rac)

e04rnc	26.0	nag_opt_handle_set_linmatineq Add one or more linear matrix inequality constraints to a problem initialized by nag_opt_handle_init (e04rac)
e04rpc	26.0	nag_opt_handle_set_quadmatineq Define bilinear matrix terms to a problem initialized by nag_opt_handle_init (e04rac)
e04rxc	26.1	nag_opt_handle_set_get_real Retrieve or write a piece of information in a problem handle initialized by nag_opt_handle_init (e04rac)
e04ryc	26.0	nag_opt_handle_print Print information about a problem handle initialized by nag_opt_handle_init (e04rac)
e04rzc	26.0	nag_opt_handle_free Destroy the problem handle initialized by nag_opt_handle_init (e04rac) and deallocate all the memory used
e04stc	26.0	nag_opt_handle_solve_ipopt Run an interior point solver on a sparse nonlinear programming problem (NLP) initialized by nag_opt_handle_init (e04rac) and defined by other functions from the suite
e04svc	26.0	nag_opt_handle_solve_pennon Run the Pennon solver on a compatible problem initialized by nag_opt_handle_init (e04rac) and defined by other functions from the suite, such as, semidefinite programming (SDP) and SDP with bilinear matrix inequalities (BMI)
e04ucc	4	nag_opt_nlp Minimization with nonlinear constraints using a sequential QP method
e04udc	23	nag_opt_nlp_revcomm_option_set_file Supply optional parameter values for nag_opt_nlp (e04ucc) or nag_opt_nlp_revcomm (e04ufc) from external file
e04uec	23	nag_opt_nlp_revcomm_option_set_string Supply optional parameter values to nag_opt_nlp (e04ucc) or nag_opt_nlp_revcomm (e04ufc) from a character string
e04ufc	23	nag_opt_nlp_revcomm Nonlinear programming (NLP), dense, active-set, SQP method, using function values and optionally first derivatives (reverse communication, comprehensive)
e04ugc	6	nag_opt_nlp_sparse NLP problem (sparse)
e04unc	5	nag_opt_nlin_lsq Solves nonlinear least squares problems using the sequential QP method
e04vgc	8	nag_opt_sparse_nlp_init Initialization function for nag_opt_sparse_nlp_solve (e04vhc)
e04vhc	8	nag_opt_sparse_nlp_solve Nonlinear programming (NLP), sparse, active-set SQP method, using function values and optionally first derivatives, recommended
e04vjc	8	nag_opt_sparse_nlp_jacobian Determine the pattern of nonzeros in the Jacobian matrix for nag_opt_sparse_nlp_solve (e04vhc)
e04vkc	8	nag_opt_sparse_nlp_option_set_file Supply optional parameter values for nag_opt_sparse_nlp_solve (e04vhc) from external file
e04vlc	8	nag_opt_sparse_nlp_option_set_string Set a single option for nag_opt_sparse_nlp_solve (e04vhc) from a character string
e04vmc	8	nag_opt_sparse_nlp_option_set_integer Set a single option for nag_opt_sparse_nlp_solve (e04vhc) from an integer argument

e04vnc	8	nag_opt_sparse_nlp_option_set_double Set a single option for nag_opt_sparse_nlp_solve (e04vhc) from a real argument
e04vrc	8	nag_opt_sparse_nlp_option_get_integer Get the setting of an integer valued option of nag_opt_sparse_nlp_solve (e04vhc)
e04vsc	8	nag_opt_sparse_nlp_option_get_double Get the setting of a real valued option of nag_opt_sparse_nlp_solve (e04vhc)
e04wbc	23	nag_opt_nlp_revcomm_init Initialization function for nag_opt_nlp_revcomm (e04ufc)
e04wcc	8	nag_opt_nlp_init Initialization function for nag_opt_nlp_solve (e04wdc)
e04wdc	8	nag_opt_nlp_solve Nonlinear programming (NLP), dense, active-set SQP method, using function values and optionally first derivatives
e04wec	8	nag_opt_nlp_option_set_file Supply optional parameter values for nag_opt_nlp_solve (e04wdc) from external file
e04wfc	8	nag_opt_nlp_option_set_string Set a single option for nag_opt_nlp_solve (e04wdc) from a character string
e04wgc	8	nag_opt_nlp_option_set_integer Set a single option for nag_opt_nlp_solve (e04wdc) from an integer argument
e04whc	8	nag_opt_nlp_option_set_double Set a single option for nag_opt_nlp_solve (e04wdc) from a real argument
e04wkc	8	nag_opt_nlp_option_get_integer Get the setting of an integer valued option of nag_opt_nlp_solve (e04wdc)
e04wlc	8	nag_opt_nlp_option_get_double Get the setting of a real valued option of nag_opt_nlp_solve (e04wdc)
e04xac	5	nag_opt_estimate_deriv Computes an approximation to the gradient vector and/or the Hessian matrix
e04xxc	2	nag_opt_init Initialization function for option setting
e04xyc	2	nag_opt_read Read options from a text file
e04xzc	2	nag_opt_free Memory freeing function for use with option setting
e04yac	2	nag_opt_lsq_check_deriv Least squares derivative checker for use with nag_opt_lsq_deriv (e04gbc)
e04ycc	2	nag_opt_lsq_covariance Covariance matrix for nonlinear least squares
e04zmc	26.0	nag_opt_handle_opt_set Option setting routine for the solvers from the NAG optimization modelling suite
e04znc	26.0	nag_opt_handle_opt_get Option getting routine for the solvers from the NAG optimization modelling suite
e04zpc	26.0	nag_opt_handle_opt_set_file Option setting routine for the solvers from the NAG optimization modelling suite from external file
