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)
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
e04mwc	26	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	nag_opt_handle_init 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)
e04rdc	26	nag_opt_sdp_read_sdpa A reader of sparse SDPA data files for linear SDP problems
e04rec	26	nag_opt_handle_set_linobj Define a linear objective function to a problem initialized by nag_opt_handle_init (e04rac)
e04rfc	26	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	nag_opt_handle_set_nlnobj Define a nonlinear objective function to a problem initialized by nag_opt_handle_init (e04rac)
e04rhc	26	nag_opt_handle_set_simplebounds Define bounds of variables of a problem initialized by nag_opt_handle_init (e04rac)
e04rjc	26	nag_opt_handle_set_linconstr Define a block of linear constraints to a problem initialized by nag_opt_handle_init (e04rac)
e04rkc	26	nag_opt_handle_set_nlnconstr Define a block of nonlinear constraints to a problem initialized by nag_opt_handle_init (e04rac)
e04rlc	26	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)
e04rnc	26	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	nag_opt_handle_set_quadmatineq Define bilinear matrix terms to a problem initialized by nag_opt_handle_init (e04rac)
e04ryc	26	nag_opt_handle_print Print information about a problem handle initialized by nag_opt_handle_init (e04rac)

e04rzc	26	nag_opt_handle_free Destroy the problem handle initialized by nag_opt_handle_init (e04rac) and deallocate all the memory used
e04stc	26	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	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	nag_opt_handle_opt_set Option setting routine for the solvers from the NAG optimization modelling suite
e04znc	26	nag_opt_handle_opt_get Option getting routine for the solvers from the NAG optimization modelling suite
e04zpc	26	nag_opt_handle_opt_set_file Option setting routine for the solvers from the NAG optimization modelling suite from external file