## NAG Library Chapter Contents

### e04 – Minimizing or Maximizing a Function

<table>
<thead>
<tr>
<th>Function Name</th>
<th>Mark of Introduction</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>e04abc</td>
<td>5</td>
<td>nag_opt_one_var_no_deriv</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Minimizes a function of one variable, using function values only</td>
</tr>
<tr>
<td>e04bbc</td>
<td>5</td>
<td>nag_opt_one_var_deriv</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Minimizes a function of one variable, requires first derivatives</td>
</tr>
<tr>
<td>e04cbc</td>
<td>9</td>
<td>nag_opt_simplex_easy</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Unconstrained minimization using simplex algorithm, function of several variables using function values only</td>
</tr>
<tr>
<td>e04ccc</td>
<td>4</td>
<td>nag_opt_simplex</td>
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<td></td>
<td></td>
<td>Unconstrained minimization using simplex algorithm</td>
</tr>
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<td></td>
<td></td>
<td><strong>Note</strong>: this function is scheduled for withdrawal at Mark 11, see Advice on Replacement Calls for Withdrawn/Superceded Functions for further information.</td>
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<tr>
<td>e04dgc</td>
<td>2</td>
<td>nag_opt_conj_grad</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Unconstrained minimization using conjugate gradients</td>
</tr>
<tr>
<td>e04fcc</td>
<td>2</td>
<td>nag_opt_lsq_no_deriv</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Unconstrained nonlinear least-squares (no derivatives required)</td>
</tr>
<tr>
<td>e04gbc</td>
<td>2</td>
<td>nag_opt_lsq_deriv</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Unconstrained nonlinear least-squares (first derivatives required)</td>
</tr>
<tr>
<td>e04hcc</td>
<td>2</td>
<td>nag_opt_check_deriv</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Derivative checker</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Note</strong>: this function is scheduled for withdrawal at Mark 10, see Advice on Replacement Calls for Withdrawn/Superceded Functions for further information.</td>
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<tr>
<td>e04hdc</td>
<td>5</td>
<td>nag_opt_check_2nd_deriv</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Checks second derivatives of a user-defined function</td>
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<td></td>
<td></td>
<td><strong>Note</strong>: this function is scheduled for withdrawal at Mark 10, see Advice on Replacement Calls for Withdrawn/Superceded Functions for further information.</td>
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<tr>
<td>e04jbc</td>
<td>2</td>
<td>nag_opt_bounds_no_deriv</td>
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<tr>
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<td></td>
<td>Bound constrained nonlinear minimization (no derivatives required)</td>
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<tr>
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<tr>
<td>e04kbc</td>
<td>2</td>
<td>nag_opt_bounds_deriv</td>
</tr>
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<td></td>
<td>Bound constrained nonlinear minimization (first derivatives required)</td>
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<tr>
<td>e04lbc</td>
<td>5</td>
<td>nag_opt_bounds_2nd_deriv</td>
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<td></td>
<td>Solves bound constrained problems (first and second derivatives required)</td>
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<tr>
<td>Code</td>
<td>Value</td>
<td>Function Description</td>
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</tr>
</tbody>
</table>
| e04mfc | 2     | **nag_opt_lp**  
Linear programming |
| 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**  
LP or QP problem (suitable for sparse problems) |
| e04nrc | 8     | **nag_opt_sparse_convex_qp_option_set_file**  
Supply optional argument 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) |
| e04ucc | 4     | **nag_opt_nlp**  
Minimization with nonlinear constraints using a sequential QP method |
| 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**  
General sparse nonlinear optimizer |
| 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 argument 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)

e04wcc  8  nag_opt_nlp_init
Initialization function for nag_opt_nlp_solve (e04wdc)

e04wde  8  nag_opt_nlp_solve
Solves the nonlinear programming (NP) problem

e04wec  8  nag_opt_nlp_option_set_file
Supply optional argument values for nag_opt_nlp_solve (e04wdc) from external file

e04wfe  8  nag_opt_nlp_option_set_string
Set a single option for nag_opt_nlp_solve (e04wdc) from a character string

e04wge  8  nag_opt_nlp_option_set_integer
Set a single option for nag_opt_nlp_solve (e04wdc) from an integer argument

e04whe  8  nag_opt_nlp_option_set_double
Set a single option for nag_opt_nlp_solve (e04wdc) from a real argument

e04wke  8  nag_opt_nlp_option_get_integer
Get the setting of an integer valued option of nag_opt_nlp_solve (e04wdc)

e04wle  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

e04xzc  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