NAG Library Chapter Contents

G02 – Correlation and Regression Analysis

G02 Chapter Introduction

Routine Name	Mark of Introduction	Purpose
G02AAF	22	nagf_correg_corrmat_nearest Computes the nearest correlation matrix to a real square matrix, using the method of Qi and Sun
G02ABF	23	nagf_correg_corrmat_nearest_bounded Computes the nearest correlation matrix to a real square matrix, augmented G02AAF to incorporate weights and bounds
G02AEF	23	nagf_correg_corrmat_nearest_kfactor Computes the nearest correlation matrix with *k*-factor structure to a real square matrix
G02AJF	24	nagf_nearest_correlation_h_weight Computes the nearest correlation matrix to a real square matrix, using element-wise weighting
G02ANF	25	nagf_nearest_correlation_shrinking Computes a correlation matrix from an approximate matrix with fixed submatrix
G02BAF	4	nagf_correg_coeffs_pearson Pearson product-moment correlation coefficients, all variables, no missing values
G02BBF	4	nagf_correg_coeffs_pearson_miss_case Pearson product-moment correlation coefficients, all variables, casewise treatment of missing values
G02BCF	4	nagf_correg_coeffs_pearson_miss_pair Pearson product-moment correlation coefficients, all variables, pairwise treatment of missing values
G02BDF	4	nagf_correg_coeffs_zero Correlation-like coefficients (about zero), all variables, no missing values
G02BEF	4	nagf_correg_coeffs_zero_miss_case Correlation-like coefficients (about zero), all variables, casewise treatment of missing values
G02BFF	4	nagf_correg_coeffs_zero_miss_pair Correlation-like coefficients (about zero), all variables, pairwise treatment of missing values
G02BGF	4	nagf_correg_coeffs_pearson_subset Pearson product-moment correlation coefficients, subset of variables, no missing values
G02BHF	4	nagf_correg_coeffs_pearson_subset_miss_case Pearson product-moment correlation coefficients, subset of variables, casewise treatment of missing values
G02BJF	4	nagf_correg_coeffs_pearson_subset_miss_pair Pearson product-moment correlation coefficients, subset of variables, pairwise treatment of missing values
G02BKF	4	nagf_correg_coeffs_zero_subset Correlation-like coefficients (about zero), subset of variables, no missing values
G02BLF	4	nagf_correg_coeffs_zero_subset_miss_case Correlation-like coefficients (about zero), subset of variables, casewise treatment of missing values

G02BMF	4	nagf_correg_coeffs_zero_subset_miss_pair Correlation-like coefficients (about zero), subset of variables, pairwise treatment of missing values
G02BNF	4	nagf_correg_coeffs_kspearman_overwrite Kendall/Spearman non-parametric rank correlation coefficients, no missing values, overwriting input data
G02BPF	4	nagf_correg_coeffs_kspearman_miss_case_overwrite Kendall/Spearman non-parametric rank correlation coefficients, casewise treatment of missing values, overwriting input data
G02BQF	4	nagf_correg_coeffs_kspearman Kendall/Spearman non-parametric rank correlation coefficients, no missing values, preserving input data
G02BRF	4	nagf_correg_coeffs_kspearman_miss_case Kendall/Spearman non-parametric rank correlation coefficients, casewise treatment of missing values, preserving input data
G02BSF	4	nagf_correg_coeffs_kspearman_miss_pair Kendall/Spearman non-parametric rank correlation coefficients, pairwise treatment of missing values
G02BTF	14	nagf_correg_ssqmat_update Update a weighted sum of squares matrix with a new observation
G02BUF	14	nagf_correg_ssqmat Computes a weighted sum of squares matrix
G02BWF	14	nagf_correg_ssqmat_to_corrmat Computes a correlation matrix from a sum of squares matrix
G02BXF	14	nagf_correg_corrmat Computes (optionally weighted) correlation and covariance matrices
G02BYF	17	nagf_correg_corrmat_partial Computes partial correlation/variance-covariance matrix from correlation/ variance-covariance matrix computed by G02BXF
G02BZF	24	nagf_correg_ssqmat_combine Combines two sums of squares matrices, for use after G02BUF
G02CAF	4	nagf_correg_linregs_const Simple linear regression with constant term, no missing values
G02CBF	4	nagf_correg_linregs_noconst Simple linear regression without constant term, no missing values
G02CCF	4	nagf_correg_linregs_const_miss Simple linear regression with constant term, missing values
G02CDF	4	nagf_correg_linregs_noconst_miss Simple linear regression without constant term, missing values
G02CEF	4	nagf_correg_linregm_service_select Service routine for multiple linear regression, select elements from vectors and matrices
G02CFF	4	nagf_correg_linregm_service_reorder Service routine for multiple linear regression, reorder elements of vectors and matrices
G02CGF	4	nagf_correg_linregm_coeffs_const Multiple linear regression, from correlation coefficients, with constant term
G02CHF	4	nagf_correg_linregm_coeffs_noconst Multiple linear regression, from correlation-like coefficients, without constant term
G02DAF	14	nagf_correg_linregm_fit Fits a general (multiple) linear regression model
G02DCF	14	nagf_correg_linregm_obs_edit Add/delete an observation to/from a general linear regression model
G02DDF	14	nagf_correg_linregm_update Estimates of linear parameters and general linear regression model from updated model
G02DEF	14	nagf_correg_linregm_var_add Add a new independent variable to a general linear regression model

G02DFF	14	nagf_correg_linregm_var_del Delete an independent variable from a general linear regression model
G02DGF	14	nagf_correg_linregm_fit_newvar Fits a general linear regression model to new dependent variable
G02DKF	14	nagf_correg_linregm_constrain Estimates and standard errors of parameters of a general linear regression model for given constraints
G02DNF	14	nagf_correg_linregm_estfunc Computes estimable function of a general linear regression model and its standard error
G02EAF	14	nagf_correg_linregm_rssq Computes residual sums of squares for all possible linear regressions for a set of independent variables
G02ECF	14	nagf_correg_linregm_rssq_stat Calculates R^2 and C_P values from residual sums of squares
G02EEF	14	nagf_correg_linregm_fit_onestep Fits a linear regression model by forward selection
G02EFF	21	nagf_correg_linregm_fit_stepwise Stepwise linear regression
G02FAF	14	nagf_correg_linregm_stat_resinf Calculates standardized residuals and influence statistics
G02FCF	15	nagf_correg_linregm_stat_durbwat Computes Durbin–Watson test statistic
G02GAF	14	nagf_correg_glm_normal Fits a generalized linear model with Normal errors
G02GBF	14	nagf_correg_glm_binomial Fits a generalized linear model with binomial errors
G02GCF	14	nagf_correg_glm_poisson Fits a generalized linear model with Poisson errors
G02GDF	14	nagf_correg_glm_gamma Fits a generalized linear model with gamma errors
G02GKF	14	nagf_correg_glm_constrain Estimates and standard errors of parameters of a general linear model for given constraints
G02GNF	14	nagf_correg_glm_estfunc Computes estimable function of a generalized linear model and its standard error
G02GPF	22	nagf_correg_glm_predict Computes a predicted value and its associated standard error based on a previously fitted generalized linear model
G02HAF	13	nagf_correg_robustm Robust regression, standard M-estimates
G02HBF	13	nagf_correg_robustm_wts Robust regression, compute weights for use with G02HDF
G02HDF	13	nagf_correg_robustm_user Robust regression, compute regression with user-supplied functions and weights
G02HFF	13	nagf_correg_robustm_user_varmat Robust regression, variance-covariance matrix following G02HDF
G02HKF	14	nagf_correg_robustm_corr_huber Calculates a robust estimation of a covariance matrix, Huber's weight function
G02HLF	14	nagf_correg_robustm_corr_user_deriv Calculates a robust estimation of a covariance matrix, user-supplied weight function plus derivatives
G02HMF	14	nagf_correg_robustm_corr_user Calculates a robust estimation of a covariance matrix, user-supplied weight function

G02JAF	21	nagf_correg_mixeff_reml Linear mixed effects regression using Restricted Maximum Likelihood (REML)
G02JBF	21	nagf_correg_mixeff_ml Linear mixed effects regression using Maximum Likelihood (ML)
G02JCF	23	nagf_correg_mixeff_hier_init Hierarchical mixed effects regression, initialization routine for G02JDF and G02JEF
G02JDF	23	nagf_correg_mixeff_hier_reml Hierarchical mixed effects regression using Restricted Maximum Likelihood (REML)
G02JEF	23	nagf_correg_mixeff_hier_ml Hierarchical mixed effects regression using Maximum Likelihood (ML)
G02KAF	22	nagf_correg_ridge_opt Ridge regression, optimizing a ridge regression parameter
G02KBF	22	nagf_correg_ridge Ridge regression using a number of supplied ridge regression parameters
G02LAF	22	nagf_correg_pls_svd Partial least squares (PLS) regression using singular value decomposition
G02LBF	22	nagf_correg_pls_wold Partial least squares (PLS) regression using Wold's iterative method
G02LCF	22	nagf_correg_pls_fit PLS parameter estimates following partial least squares regression by G02LAF or G02LBF
G02LDF	22	nagf_correg_pls_pred PLS predictions based on parameter estimates from G02LCF
G02MAF	25	nagf_correg_lars Least angle regression (LARS), least absolute shrinkage and selection operator (LASSO) and forward stagewise regression
G02MBF	25	nagf_correg_lars_xtx Least Angle Regression (LARS), Least Absolute Shrinkage and Selection Operator (LASSO) and forward stagewise regression using the cross-products matrix
G02MCF	25	nagf_correg_lars_param Additional parameter calculate following Least Angle Regression (LARS), Least Absolute Shrinkage and Selection Operator (LASSO) or forward stagewise regression
G02QFF	23	nagf_correg_quantile_linreg_easy Linear quantile regression, simple interface, independent, identically distributed (IID) errors
G02QGF	23	nagf_correg_quantile_linreg Linear quantile regression, comprehensive interface
G02ZKF	23	nagf_correg_optset Option setting routine for G02QGF
G02ZLF	23	nagf_correg_optget Option getting routine for G02QGF