

NAG Library Chapter Contents

G05 – Random Number Generators

G05 Chapter Introduction

Routine Name	Mark of Introduction	Purpose
G05HKF	20	Univariate time series, generate n terms of either a symmetric GARCH process or a GARCH process with asymmetry of the form $(\epsilon_{t-1} + \gamma)^2$ Note: this routine is scheduled for withdrawal at Mark 24, see Advice on Replacement Calls for Withdrawn/Superseded Routines for further information.
G05HLF	20	Univariate time series, generate n terms of a GARCH process with asymmetry of the form $(\epsilon_{t-1} + \gamma\epsilon_{t-1})^2$ Note: this routine is scheduled for withdrawal at Mark 24, see Advice on Replacement Calls for Withdrawn/Superseded Routines for further information.
G05HMF	20	Univariate time series, generate n terms of an asymmetric Glosten, Jagannathan and Runkle (GJR) GARCH process Note: this routine is scheduled for withdrawal at Mark 24, see Advice on Replacement Calls for Withdrawn/Superseded Routines for further information.
G05HNF	20	Univariate time series, generate n terms of an exponential GARCH (EGARCH) process Note: this routine is scheduled for withdrawal at Mark 24, see Advice on Replacement Calls for Withdrawn/Superseded Routines for further information.
G05KAF	20	Pseudorandom real numbers, uniform distribution over (0,1), seeds and generator number passed explicitly Note: this routine is scheduled for withdrawal at Mark 24, see Advice on Replacement Calls for Withdrawn/Superseded Routines for further information.
G05KBF	20	Initialize seeds of a given generator for random number generating routines (that pass seeds explicitly) to give a repeatable sequence Note: this routine is scheduled for withdrawal at Mark 24, see Advice on Replacement Calls for Withdrawn/Superseded Routines for further information.
G05KCF	20	Initialize seeds of a given generator for random number generating routines (that pass seeds explicitly) to give non-repeatable sequence Note: this routine is scheduled for withdrawal at Mark 24, see Advice on Replacement Calls for Withdrawn/Superseded Routines for further information.
G05KEF	20	Pseudorandom logical (boolean) value, seeds and generator number passed explicitly Note: this routine is scheduled for withdrawal at Mark 24, see Advice on Replacement Calls for Withdrawn/Superseded Routines for further information.
G05KFF	22	Initializes a pseudorandom number generator to give a repeatable sequence

G05KGF	22	Initializes a pseudorandom number generator to give a non-repeatable sequence
G05KHF	22	Primes a pseudorandom number generator for generating multiple streams using leap-frog
G05KJF	22	Primes a pseudorandom number generator for generating multiple streams using skip-ahead
G05LAF	20	Generates a vector of random numbers from a Normal distribution, seeds and generator number passed explicitly Note: this routine is scheduled for withdrawal at Mark 24, see Advice on Replacement Calls for Withdrawn/Superseded Routines for further information.
G05LBF	20	Generates a vector of random numbers from a Student's t -distribution, seeds and generator number passed explicitly Note: this routine is scheduled for withdrawal at Mark 24, see Advice on Replacement Calls for Withdrawn/Superseded Routines for further information.
G05LCF	20	Generates a vector of random numbers from a χ^2 distribution, seeds and generator number passed explicitly Note: this routine is scheduled for withdrawal at Mark 24, see Advice on Replacement Calls for Withdrawn/Superseded Routines for further information.
G05LDF	20	Generates a vector of random numbers from an F -distribution, seeds and generator number passed explicitly Note: this routine is scheduled for withdrawal at Mark 24, see Advice on Replacement Calls for Withdrawn/Superseded Routines for further information.
G05LEF	20	Generates a vector of random numbers from a β distribution, seeds and generator number passed explicitly Note: this routine is scheduled for withdrawal at Mark 24, see Advice on Replacement Calls for Withdrawn/Superseded Routines for further information.
G05LFF	20	Generates a vector of random numbers from a γ distribution, seeds and generator number passed explicitly Note: this routine is scheduled for withdrawal at Mark 24, see Advice on Replacement Calls for Withdrawn/Superseded Routines for further information.
G05LGF	20	Generates a vector of random numbers from a uniform distribution, seeds and generator number passed explicitly Note: this routine is scheduled for withdrawal at Mark 24, see Advice on Replacement Calls for Withdrawn/Superseded Routines for further information.
G05LHF	20	Generates a vector of random numbers from a triangular distribution, seeds and generator number passed explicitly Note: this routine is scheduled for withdrawal at Mark 24, see Advice on Replacement Calls for Withdrawn/Superseded Routines for further information.
G05LJF	20	Generates a vector of random numbers from an exponential distribution, seeds and generator number passed explicitly Note: this routine is scheduled for withdrawal at Mark 24, see Advice on Replacement Calls for Withdrawn/Superseded Routines for further information.

G05LKF	20	Generates a vector of random numbers from a log-normal distribution, seeds and generator number passed explicitly Note: this routine is scheduled for withdrawal at Mark 24, see Advice on Replacement Calls for Withdrawn/Superseded Routines for further information.
G05LLF	20	Generates a vector of random numbers from a Cauchy distribution, seeds and generator number passed explicitly Note: this routine is scheduled for withdrawal at Mark 24, see Advice on Replacement Calls for Withdrawn/Superseded Routines for further information.
G05LMF	20	Generates a vector of random numbers from a Weibull distribution, seeds and generator number passed explicitly Note: this routine is scheduled for withdrawal at Mark 24, see Advice on Replacement Calls for Withdrawn/Superseded Routines for further information.
G05LNF	20	Generates a vector of random numbers from a logistic distribution, seeds and generator number passed explicitly Note: this routine is scheduled for withdrawal at Mark 24, see Advice on Replacement Calls for Withdrawn/Superseded Routines for further information.
G05LPF	20	Generates a vector of random numbers from a von Mises distribution, seeds and generator number passed explicitly Note: this routine is scheduled for withdrawal at Mark 24, see Advice on Replacement Calls for Withdrawn/Superseded Routines for further information.
G05LQF	20	Generates a vector of random numbers from an exponential mixture distribution, seeds and generator number passed explicitly Note: this routine is scheduled for withdrawal at Mark 24, see Advice on Replacement Calls for Withdrawn/Superseded Routines for further information.
G05LXF	21	Generates a matrix of random numbers from a multivariate Student's <i>t</i>-distribution, seeds and generator passed explicitly Note: this routine is scheduled for withdrawal at Mark 24, see Advice on Replacement Calls for Withdrawn/Superseded Routines for further information.
G05LYF	21	Generates a matrix of random numbers from a multivariate Normal distribution, seeds and generator passed explicitly Note: this routine is scheduled for withdrawal at Mark 24, see Advice on Replacement Calls for Withdrawn/Superseded Routines for further information.
G05LZF	20	Generates a vector of random numbers from a multivariate Normal distribution, seeds and generator number passed explicitly Note: this routine is scheduled for withdrawal at Mark 24, see Advice on Replacement Calls for Withdrawn/Superseded Routines for further information.
G05MAF	20	Generates a vector of random integers from a uniform distribution, seeds and generator number passed explicitly Note: this routine is scheduled for withdrawal at Mark 24, see Advice on Replacement Calls for Withdrawn/Superseded Routines for further information.

G05MBF	20	Generates a vector of random integers from a geometric distribution, seeds and generator number passed explicitly Note: this routine is scheduled for withdrawal at Mark 24, see Advice on Replacement Calls for Withdrawn/Superseded Routines for further information.
G05MCF	20	Generates a vector of random integers from a negative binomial distribution, seeds and generator number passed explicitly Note: this routine is scheduled for withdrawal at Mark 24, see Advice on Replacement Calls for Withdrawn/Superseded Routines for further information.
G05MDF	20	Generates a vector of random integers from a logarithmic distribution, seeds and generator number passed explicitly Note: this routine is scheduled for withdrawal at Mark 24, see Advice on Replacement Calls for Withdrawn/Superseded Routines for further information.
G05MEF	20	Generates a vector of random integers from a Poisson distribution with varying mean, seeds and generator number passed explicitly Note: this routine is scheduled for withdrawal at Mark 24, see Advice on Replacement Calls for Withdrawn/Superseded Routines for further information.
G05MJF	20	Generates a vector of random integers from a binomial distribution, seeds and generator number passed explicitly Note: this routine is scheduled for withdrawal at Mark 24, see Advice on Replacement Calls for Withdrawn/Superseded Routines for further information.
G05MKF	20	Generates a vector of random integers from a Poisson distribution, seeds and generator number passed explicitly Note: this routine is scheduled for withdrawal at Mark 24, see Advice on Replacement Calls for Withdrawn/Superseded Routines for further information.
G05MLF	20	Generates a vector of random integers from a hypergeometric distribution, seeds and generator number passed explicitly Note: this routine is scheduled for withdrawal at Mark 24, see Advice on Replacement Calls for Withdrawn/Superseded Routines for further information.
G05MRF	20	Generates a vector of random integers from a multinomial distribution, seeds and generator number passed explicitly Note: this routine is scheduled for withdrawal at Mark 24, see Advice on Replacement Calls for Withdrawn/Superseded Routines for further information.
G05MZF	20	Generates a vector of random integers from a general discrete distribution, seeds and generator number passed explicitly Note: this routine is scheduled for withdrawal at Mark 24, see Advice on Replacement Calls for Withdrawn/Superseded Routines for further information.
G05NAF	20	Pseudorandom permutation of an integer vector Note: this routine is scheduled for withdrawal at Mark 24, see Advice on Replacement Calls for Withdrawn/Superseded Routines for further information.
G05NBF	20	Pseudorandom sample from an integer vector Note: this routine is scheduled for withdrawal at Mark 24, see Advice on Replacement Calls for Withdrawn/Superseded Routines for further information.

G05NCF	22	Pseudorandom permutation of an integer vector
G05NDF	22	Pseudorandom sample from an integer vector
G05PAF	20	Generates a realization of a time series from an ARMA model Note: this routine is scheduled for withdrawal at Mark 24, see Advice on Replacement Calls for Withdrawn/Superseded Routines for further information.
G05PCF	20	Generates a realization of a multivariate time series from a VARMA model Note: this routine is scheduled for withdrawal at Mark 24, see Advice on Replacement Calls for Withdrawn/Superseded Routines for further information.
G05PDF	22	Generates a realization of a time series from a GARCH process with asymmetry of the form $(\epsilon_{t-1} + \gamma)^2$
G05PEF	22	Generates a realization of a time series from a GARCH process with asymmetry of the form $(\epsilon_{t-1} + \gamma\epsilon_{t-1})^2$
G05PFF	22	Generates a realization of a time series from an asymmetric GJosten, Jagannathan and Runkle (GJR) GARCH process
G05PGF	22	Generates a realization of a time series from an exponential GARCH (EGARCH) process
G05PHF	22	Generates a realization of a time series from an ARMA model
G05PJF	22	Generates a realization of a multivariate time series from a VARMA model
G05PMF	22	Generates a realization of a time series from an exponential smoothing model
G05PXF	22	Generates a random orthogonal matrix
G05PYF	22	Generates a random correlation matrix
G05PZF	22	Generates a random two-way table
G05QAF	20	Computes a random orthogonal matrix Note: this routine is scheduled for withdrawal at Mark 24, see Advice on Replacement Calls for Withdrawn/Superseded Routines for further information.
G05QBF	20	Computes a random correlation matrix Note: this routine is scheduled for withdrawal at Mark 24, see Advice on Replacement Calls for Withdrawn/Superseded Routines for further information.
G05QDF	20	Generates a random table matrix Note: this routine is scheduled for withdrawal at Mark 24, see Advice on Replacement Calls for Withdrawn/Superseded Routines for further information.
G05RAF	21	Generates a matrix of random numbers from a Gaussian copula, seeds and generator passed explicitly Note: this routine is scheduled for withdrawal at Mark 24, see Advice on Replacement Calls for Withdrawn/Superseded Routines for further information.
G05RBF	21	Generates a matrix of random numbers from a Student's t -copula, seeds and generator passed explicitly Note: this routine is scheduled for withdrawal at Mark 24, see Advice on Replacement Calls for Withdrawn/Superseded Routines for further information.
G05RCF	22	Generates a matrix of pseudorandom numbers from a Student's t -copula
G05RDF	22	Generates a matrix of pseudorandom numbers from a Gaussian copula

G05RYF	22	Generates a matrix of pseudorandom numbers from a multivariate Student's t -distribution
G05RZF	22	Generates a matrix of pseudorandom numbers from a multivariate Normal distribution
G05SAF	22	Generates a vector of pseudorandom numbers from a uniform distribution over $(0, 1]$
G05SBF	22	Generates a vector of pseudorandom numbers from a beta distribution
G05SCF	22	Generates a vector of pseudorandom numbers from a Cauchy distribution
G05SDF	22	Generates a vector of pseudorandom numbers from a χ^2 distribution
G05SEF	22	Generates a vector of pseudorandom numbers from a Dirichlet distribution
G05SFF	22	Generates a vector of pseudorandom numbers from an exponential distribution
G05SGF	22	Generates a vector of pseudorandom numbers from an exponential mix distribution
G05SHF	22	Generates a vector of pseudorandom numbers from an F -distribution
G05SJF	22	Generates a vector of pseudorandom numbers from a gamma distribution
G05SKF	22	Generates a vector of pseudorandom numbers from a Normal distribution
G05SLF	22	Generates a vector of pseudorandom numbers from a logistic distribution
G05SMF	22	Generates a vector of pseudorandom numbers from a log-normal distribution
G05SNF	22	Generates a vector of pseudorandom numbers from a Student's t -distribution
G05SPF	22	Generates a vector of pseudorandom numbers from a triangular distribution
G05SQF	22	Generates a vector of pseudorandom numbers from a uniform distribution over $[a, b]$
G05SRF	22	Generates a vector of pseudorandom numbers from a von Mises distribution
G05SSF	22	Generates a vector of pseudorandom numbers from a Weibull distribution
G05TAF	22	Generates a vector of pseudorandom integers from a binomial distribution
G05TBF	22	Generates a vector of pseudorandom logical values
G05TCF	22	Generates a vector of pseudorandom integers from a geometric distribution
G05TDF	22	Generates a vector of pseudorandom integers from a general discrete distribution
G05TEF	22	Generates a vector of pseudorandom integers from a hypergeometric distribution
G05TFF	22	Generates a vector of pseudorandom integers from a logarithmic distribution
G05TGF	22	Generates a vector of pseudorandom integers from a multinomial distribution
G05THF	22	Generates a vector of pseudorandom integers from a negative binomial distribution
G05TJF	22	Generates a vector of pseudorandom integers from a Poisson distribution
G05TKF	22	Generates a vector of pseudorandom integers from a Poisson distribution with varying mean
G05TLF	22	Generates a vector of pseudorandom integers from a uniform distribution

G05YAF	20	Multi-dimensional quasi-random number generator with a uniform probability distribution Note: this routine is scheduled for withdrawal at Mark 23, see Advice on Replacement Calls for Withdrawn/Superseded Routines for further information.
G05YBF	20	Multi-dimensional quasi-random number generator with a Gaussian or log-normal probability distribution Note: this routine is scheduled for withdrawal at Mark 23, see Advice on Replacement Calls for Withdrawn/Superseded Routines for further information.
G05YCF	21	Initializes the Faure generator (G05YDF/G05YJF/G05YKF) Note: this routine is scheduled for withdrawal at Mark 24, see Advice on Replacement Calls for Withdrawn/Superseded Routines for further information.
G05YDF	21	Generates a sequence of quasi-random numbers using Faure's method Note: this routine is scheduled for withdrawal at Mark 24, see Advice on Replacement Calls for Withdrawn/Superseded Routines for further information.
G05YEF	21	Initializes the Sobol generator (G05YFF/G05YJF/G05YKF) Note: this routine is scheduled for withdrawal at Mark 24, see Advice on Replacement Calls for Withdrawn/Superseded Routines for further information.
G05YFF	21	Generates a sequence of quasi-random numbers using Sobol's method Note: this routine is scheduled for withdrawal at Mark 24, see Advice on Replacement Calls for Withdrawn/Superseded Routines for further information.
G05YGF	21	Initializes the Niederreiter generator (G05YHF/G05YJF/G05YKF) Note: this routine is scheduled for withdrawal at Mark 24, see Advice on Replacement Calls for Withdrawn/Superseded Routines for further information.
G05YHF	21	Generates a sequence of quasi-random numbers using Niederreiter's method Note: this routine is scheduled for withdrawal at Mark 24, see Advice on Replacement Calls for Withdrawn/Superseded Routines for further information.
G05YJF	21	Generates a Normal quasi-random number sequence
G05YKF	21	Generates a log-normal quasi-random number sequence
G05YLF	22	Initializes a quasi-random number generator
G05YMF	22	Generates a uniform quasi-random number sequence
G05YNF	22	Initializes a scrambled quasi-random number generator
