Title

statistical — Statistical functions

Contents Description Remarks and examples Also see

Contents

[M-5] Manual entry	Function	Purpose
Pseudorandom variates		
runiform()	`runiform()`	uniform pseudorandom variates
	`rseed()`	obtain or set the random-variate generator seed
	`rbeta()`	beta pseudorandom variates
	`rbinomial()`	binomial pseudorandom variates
	`rchi2()`	chi-squared pseudorandom variates
	`rdiscrete()`	discrete pseudorandom variates
	`rgamma()`	gamma pseudorandom variates
	`rhypergeometric()`	hypergeometric pseudorandom variates
	`rnbinomial()`	negative binomial pseudorandom variates
	`rnormal()`	normal (Gaussian) pseudorandom variates
	`rpoisson()`	Poisson pseudorandom variates
	`rt()`	Student's t pseudorandom variates
Means, variances, & correlations		
mean()	`mean()`	mean
	`variance()`	variance
	`quadvariance()`	quad-precision variance
	`meanvariance()`	mean and variance
	`quadmeanvariance()`	quad-precision mean and variance
	`correlation()`	correlation
	`quadcorrelation()`	quad-precision correlation
cross()	`cross()`	$X'X$, $X'Z$, $X'\mathrm{diag}(w)Z$, etc.
corr()	`corr()`	make correlation from variance matrix
crossdev()	`crossdev()`	$(X{:}-x)'(X{:}-x)$, $(X{:}-x)'(Z{:}-z)$, etc.
quadcross()	`quadcross()`	quad-precision `cross()`
	`quadcrossdev()`	quad-precision `crossdev()`

Factorial & combinations

factorial( )	`factorial()`	factorial
	`lnfactorial()`	natural logarithm of factorial
	`gamma()`	gamma function
	`lngamma()`	natural logarithm of gamma function
	`digamma()`	derivative of `lngamma()`
	`trigamma()`	second derivative of `lngamma()`
comb( )	`comb()`	combinatorial function *n* choose *k*
cvpermute( )	`cvpermutesetup()`	permutation setup
	`cvpermute()`	return permutations, one at a time

Densities & distributions

normal( )	`normalden()`	normal density
	`normal()`	cumulative normal dist.
	`invnormal()`	inverse cumulative normal
	`lnnormalden()`	logarithm of the normal density
	`lnnormal()`	logarithm of the cumulative normal dist.
	`binormal()`	cumulative binormal dist.
	`betaden()`	beta density
	`ibeta()`	cumulative beta dist.; a.k.a. incomplete beta function
	`ibetatail()`	reverse cumulative beta dist.
	`invibeta()`	inverse cumulative beta
	`invibetatail()`	inverse reverse cumulative beta
	`binomialp()`	binomial probability
	`binomial()`	cumulative binomial dist.
	`binomialtail()`	reverse cumulative binomial dist.
	`invbinomial()`	inverse cumulative binomial
	`invbinomialtail()`	inverse reverse cumulative binomial
	`chi2()`	cumulative chi-squared dist.
	`chi2den()`	chi-squared density
	`chi2tail()`	reverse cumulative chi-squared dist.
	`invchi2()`	inverse cumulative chi-squared
	`invchi2tail()`	inverse reverse cumulative chi-squared
	`dunnettprob()`	cumulative multiple range dist.; used in Dunnett's multiple comparison
	`invdunnettprob()`	inverse cumulative multiple range dist.; used in Dunnett's multiple comparison

normal(), *continued*	Fden()	F density
	F()	cumulative F dist.
	Ftail()	reverse cumulative F dist.
	invF()	inverse cumulative F
	invFtail()	inverse reverse cumulative F
	———	
	gammaden()	gamma density
	gammap()	cumulative gamma dist.; a.k.a. incomplete gamma function
	gammaptail()	reverse cumulative gamma dist.;
	invgammap()	inverse cumulative gamma
	invgammaptail()	inverse reverse cumulative gamma
	dgammapda()	$\partial P(a,x)/\partial a$, where $P(a,x) =$ gammap(a,x)
	dgammapdx()	$\partial P(a,x)/\partial x$, where $P(a,x) =$ gammap(a,x)
	dgammapdada()	$\partial^2 P(a,x)/\partial a^2$, where $P(a,x) =$ gammap(a,x)
	dgammapdadx()	$\partial^2 P(a,x)/\partial a \partial x$, where $P(a,x) =$ gammap(a,x)
	dgammapdxdx()	$\partial^2 P(a,x)/\partial x^2$, where $P(a,x) =$ gammap(a,x)
	———	
	hypergeometricp()	hypergeometric probability
	hypergeometric()	cumulative hypergeometric
	———	
	nbetaden()	noncentral beta density
	nibeta()	cumulative noncentral beta dist.
	invnibeta()	inverse cumulative noncentral beta
	———	
	nbinomialp()	negative binomial probability
	nbinomial()	cumulative negative binomial
	nbinomialtail()	reverse cumulative negative binomial
	invnbinomial()	inverse cumulative negative binomial
	invnbinomialtail()	inverse reverse cumulative negative binomial
	———	
	nchi2()	cumulative noncentral chi-squared dist.
	nchi2den()	noncentral chi-squared density
	nchi2tail()	reverse cumulative noncentral chi-squared dist.
	invnchi2()	inverse cumulative noncentral chi-squared dist.
	invnchi2tail()	inverse reverse cumulative noncentral chi-squared dist.
	npnchi2()	noncentrality parameter of nchi2()
	———	
	nF()	cumulative noncentral F dist.
	nFden()	noncentral F density
	nFtail()	reverse cumulative noncentral F dist.
	invnFtail()	inverse reverse cumulative noncentral F
	npnF()	noncentrality parameter of nF()
	———	

normal(), *continued*	`nt()`	cumulative noncentral Student's t dist.
	`ntden()`	noncentral Student's t density
	`nttail()`	reverse cumulative noncentral t dist.
	`invnttail()`	inverse reverse cumulative noncentral t
	`npnt()`	noncentrality parameter of `nt()`
	`poissonp()`	Poisson probability
	`poisson()`	cumulative Poisson
	`poissontail()`	reverse cumulative Poisson
	`invpoisson()`	inverse cumulative Poisson
	`invpoissontail()`	inverse reverse cumulative Poisson)
	`t()`	Student's t dist.
	`tden()`	Student's t density
	`ttail()`	reverse cumulative Student's t dist.
	`invt()`	inverse cumulative Student's t dist.
	`invttail()`	inverse reverse cumulative Student's t
	`tukeyprob()`	cumulative multiple range dist.; used in Tukey's multiple comparison
	`invtukeyprob()`	inverse cumulative multiple range dist.; used in Tukey's multiple comparison

Maximization & minimization

optimize()	`optimize()`	function maximization and minimization
	`optimize_evaluate()`	evaluate function at initial values
	`optimize_init()`	begin optimization
	`optimize_init_*()`	set details
	`optimize_result_*()`	access results
	`optimize_query()`	report settings
moptimize()	`moptimize()`	function optimization
	`moptimize_evaluate()`	evaluate function at initial values
	`moptimize_init()`	begin setup of optimization problem
	`moptimize_init_*()`	set details
	`moptimize_result_*()`	access `moptimize()` results
	`moptimize_ado_cleanup()`	perform cleanup after ado
	`moptimize_query()`	report settings
	`moptimize_util_*()`	utility functions for writing evaluators and processing results

Logits, odds, & related

logit()	`logit()`	log of the odds ratio
	`invlogit()`	inverse log of the odds ratio
	`cloglog()`	complementary log-log
	`invcloglog()`	inverse complementary log-log

Multivariate normal

ghk( )	`ghk()`	GHK multivariate normal (MVN) simulator
	`ghk_init()`	GHK MVN initialization
	`ghk_init_*()`	set details
	`ghk()`	perform simulation
	`ghk_query_npts()`	return number of simulation points
ghkfast( )	`ghkfast()`	GHK MVN simulator
	`ghkfast_init()`	GHK MVN initialization
	`ghkfast_init_*()`	set details
	`ghkfast()`	perform simulation
	`ghkfast_i()`	results for the ith observation
	`ghk_query_*()`	display settings

Description

The above functions are statistical, probabilistic, or designed to work with data matrices.

Remarks and examples

stata.com

Concerning data matrices, see

[M-4] **stata**	Stata interface functions

and especially

[M-5] **st_data( )**	Load copy of current Stata dataset
[M-5] **st_view( )**	Make matrix that is a view onto current Stata dataset

For other mathematical functions, see

[M-4] **matrix**	Matrix mathematical functions
[M-4] **scalar**	Scalar mathematical functions
[M-4] **mathematical**	Important mathematical functions

Also see

[M-4] **intro** — Index and guide to functions