RogueWave
by Perforce

CSNL to CNL Cross Reference

In order to best match the ecosystem and rules of their language, each IMSL product uses different naming conventions and function breakdowns. Because of this, when looking to migrate from one IMSL product to another, it can be cumbersome to figure out how each IMSL usage maps between the products. In this document, we will look at how functionality can be mapped during a common migration: C# Numerical Library to C Numerical Library.

Because of the previously mentioned differences between each of the IMSL products, there are a few important things to take note of before continuing:

- IMSL C functions are split across two libraries, C/Math and C/Stat. The prefix for C/Math functions is imsl_, and the prefix for C/Stat functions is imsls_.
- IMSL C# is implemented using double precision.
- For more details on IMSL C naming conventions, see the C/Math or C/Stat documentation.

IMSL C#	IMSL C
Math - Linear Systems	
LU	lin_sol_gen
LU.Solve	lin_sol_gen
LU.Condition	lin_sol_gen
LU.Determinant	n/a
LU.Inverse	lin_sol_gen
ComplexLU	lin_sol_gen
ComplexLU.Solve	lin_sol_gen
ComplexLU.Condition	lin_sol_gen
ComplexLU.Solve	lin_sol_gen
ComplexLU.Inverse	lin_sol_gen
Cholesky	lin_sol_posdef
Cholesky.Solve	lin_sol_posdef
Cholesky.Inverse	lin_sol_posdef
SuperLU	superlu
SparseCholesky	sparse_cholesky_smp
ComplexSuperLU	superlu
ComplexSparseCholesky	sparse_cholesky_smp
ConjugateGradient	lin_sol_def_cg
GenMinRes	lin_gen_min_residual

QR.Solve	lin_least_squares_gen
QR.GetQ, QR.GetR	lin_lsq_lin_constraints
SVD	lin_svd_gen
SVD.Inverse	lin_svd_gen
Math - Eigensystem Analysis	
Eigen.GetValues	eig_gen
Eigen.GetVectors	eig_gen
Eigen.PerformanceIndex	n/a
SymEigen.GetValues	eig_symgen
SymEigen.GetVectors	eig_symgen
SymEigen.GetperformanceIndex	n/a
Math - Interpolation and Approximation	
CsInterpolate	cub_spline_interp_e_cnd
CsAkima	cub_spline_interp_shape
CsShape	cub_spline_interp_shape
CsShapeC2	cub_spline_smooth
CsPeriodic	cub_spline_interp_e_cnd
CsTCB	cub_spline_tcb
BsInterpolate	spline_interp
Spline2DInterpolate	spline_2d_interp
Bspline.Eval	spline_value
Bspline.Derivative	spline_value

Bspline.Integral	spline_integral
Spline2DInterpolate.Eval	spline_2d_value
Spline2DInterpolate.Derivative	spline_2d_value
Spline.Eval	cub_spline_value
Spline.Derivative	cub_spline_value
Spline.Integral	cub_spline_integral
UserBasisRegression	user_fcn_least_squares
BsLeastSquares	spline_least_squares
Spline2DLeastSquares	spline_2d_least_squares
CsSmooth	cub_spline_smooth
CsSmoothC2	cub_spline_smooth
RadialBasis	radial_scattered_fit
Math - Integration and Differentiation	
Quadrature	int_fcn
HyperRectangleQuadrature	int_fcn_qmc
Math - Differential Equations	
OdeRungeKutta	ode_runge_kutta
OdeAdamsGear	ode_adams_gear
FeynmanKac	feynman_kac
FeynmanKac	feynman_kac_evaluate
Math - Transforms	
FFT.Forward	fft_real

FFT.Backward	fft_real
ComplexFFT.Forward	fft_complex
ComplexFFT.Backward	fft_complex
Math - Nonlinear Equations	
ZeroPolynomial	zeros_poly
ZeroFunction	zeros_fcn
ZerosFunction	zeros_function
ZeroSystem	zeros_sys_eqn
Math - Optimization	
MinUnCon	min_uncon
MinUnCon	min_uncon_deriv
MinUnconMultiVar	min_uncon_multivar
NonlinLeastSquares	nonlin_least_squares
BoundedLeastSquares	bounded_least_squares
DenseLP	linear_programming
LinearProgramming	lin_prog
QuadraticProgramming	quadratic_prog
MinConGenLin	min_con_gen_lin
MinConNonlin	min_con_nonlin
MPSReader	read_mps
MinConNLP	constrained_nlp
NumericalDerivatives	jacobian

BoundedVariableLeastSquares	lin_lsq_lin_constraints
NonNegativeLeastSquares	nonneg_least_squares
Math - Special Functions	
Sfun.Cot	n/a
Sfun.Asinh	n/a
Sfun.Acosh	n/a
Sfun.Atanh	n/a
Sfun.Fact	n/a
Sfun.Gamma	gamma
Sfun.LogGamma	log_gamma
Sfun.IncompleteGamma	gamma_incomplete
Sfun.Psi	psi
Sfun.Psi1	psi1
Sfun.Poch	n/a
Sfun.Beta	beta
Sfun.LogBeta	log_beta
Sfun.BetaIncomplete	beta_incomplete
Sfun.Erf	erf
Sfun.Erfc	erfc
Sfun.Erfce	erfce
Sfun.ErfInverse	erf_inverse
Sfun.ErfcInverse	erfc_inverse

Bessel.J	bessel_J0
Bessel.J	bessel_J1
Bessel.J	bessel_Jx
Bessel.Y	bessel_Y0
Bessel.Y	bessel_Y1
Bessel.Y	bessel_Yx
Bessel.I	bessel_I0
Bessel.I	bessel_I1
Bessel.I	bessel_Ix
Bessel.K	bessel_K0
Bessel.K	bessel_K1
Bessel.K	bessel_Kx
Bessel.I	bessel_exp_I0
Bessel.I	bessel_exp_I1
Bessel.K	bessel_exp_K0
Bessel.K	bessel_exp_K1
Finance.Cumipmt	cumulative_interest
Finance.Cumprinc	cumulative_principal
Finance.Db	depreciation_db
Finance.Ddb	depreciation_ddb
Finance.Sln	depreciation_sln
Finance.Syd	depreciation_syd

Finance.Vdb	depreciation_vdb
Finance.Dollarde	dollar_decimal
Finance.Dollarfr	dollar_fraction
Finance.Effect	effective_rate
Finance.Fv	future_value
Finance.Fvschedule	future_value_schedule
Finance.Ipmt	interest_payment
Finance.Rate	interest_rate_annuity
Finance.Irr	internal_rate_of_return
Finance.Xirr	internal_rate_schedule
Finance.Mirr	modified_internal_rate
Finance.Npv	net_present_value
Finance.Nominal	nominal_rate
Finance.Nper	number_of_periods
Finance.Pmt	payment
Finance.Pv	present_value
Finance.Xnpv	present_value_schedule
Finance.Ppmt	principal_payment
Bond.Accrintm	accr_interest_maturity
Bond.Accrint	accr_interest_periodic
Bond.Tbilleq	bond_equivalent_yield
Bond.Convexity	convexity

Bond.Coupdays	coupon_days
Bond.Coupnum	coupon_number
Bond.Coupdaybs	days_before_settlement
Bond.Coupdaysnc	days_to_next_coupon
Bond.Amordegrc	depreciation_amordegrc
Bond.Amorlinc	depreciation_amorlinc
Bond.Pricedisc	discount_price
Bond.Dsc	discount_rate
Bond.Yielddisc	discount_yield
Bond.Duration	duration
Bond.Intrate	interest_rate_security
Bond.Mduration	macauley_duration
Bond.Coupncd	next_coupon_date
Bond.Couppcd	previous_coupon_date
Bond.Price	price
Bond.Pricemat	price_maturity
Bond.Received	received_at_maturity
Bond.Tbillprice	treasury_bill_price
Bond.Tbillyield	treasury_bill_yield
Bond.Yearfrac	year_fraction
Bond.Yieldmat	yield_maturity
Bond.Yield	yield_periodic

Bond.Priceyield	n/a
Math - Printing Functions	
PrintMatrix	write_matrix
Math - Utilities	
Matrix.Multiply	mat_mul_rect
Matrix.Transpose	mat_mul_rect
ComplexMatrix.Transpose	mat_mul_rect
SparseMatrix.Transpose	mat_mul_rect_coordinate
ComplexSparseMatrix.Transpose	mat_mul_rect_coordinate
ComplexMatrix.Multiply	mat_mul_rect
SparseMatrix.Multiply	mat_mul_rect_coordinate
ComplexSparseMatrix.Multiply	mat_mul_rect_coordinate
Matrix.InfinityNorm	matrix_norm
Matrix.OneNorm	matrix_norm
Matrix.FrobeniusNorm	matrix_norm
ComplexMatrix.InfinityNorm	n/a
ComplexMatrix.OneNorm	n/a
ComplexMatrix.FrobeniusNorm	n/a
SparseMatrix.InfinityNorm	matrix_norm_coordinate
SparseMatrix.OneNorm	matrix_norm_coordinate
SparseMatrix.FrobeniusNorm	matrix_norm_coordinate
ComplexSparseMatrix.InfinityNorm	n/a

ComplexSparseMatrix.OneNorm	n/a
ComplexSparseMatrix.FrobeniusNorm	n/a
Sort	sort
Physical	constant
Stat - Basic Statistics	
TableOneWay	table_oneway
TableTwoWay	table_twoway
Sort and TableMultiWay	sort_data
Summary	simple_statistics
Ranks	ranks
EmpiricalQuantiles	empirical_quantiles
NormOneSample	normal_one_sample
NormTwoSample	normal_two_sample
Stat - Regression	
LinearRegression	regression
LinearRegression.CaseStatistics	regression_prediction
LinearRegression.ANOVA	regression_summary
LinearRegression.CoefficientTTests	regression_summary
RegressorsForGLM	regressors_for_glm
SelectionRegression	regression_selection
StepwiseRegression	regression_stepwise
NonlinearRegression	nonlinear_regression

Stat - Correlation and Covariance	
Covariances	covariances
PartialCovariances	partial_covariances
Stat - Analysis of Variance and Designed Experiments	
ANOVA	anova_oneway
ANCOVA	ancovar
ANOVAFactorial	anova_factorial
MultipleComparisons	multiple_comparisons
Stat - Categorical and Discrete Data Analysis	
ContingencyTable	contingency_table
CategoricalGenLinModel	categorical_glm
Stat - Nonparametric Statistics	
SignTest	sign_test
WilcoxonRankSum	wilcoxon_rank_sum
Stat - Tests of Goodness of Fit	
KolmogorovOneSample	kolmogorov_one
ChiSquaredTest	chi_squared_test
NormalityTest	normality_test
KolmogorovTwoSample	kolmogorov_two
Stat - Time Series Analysis and Forecasting	
Difference	difference
ARSeasonFit	seasonal_fit

ARMAEstimateMissing	estimate_missing
ARMA	arma
AutoCorrelation	autocorrelation
CrossCorrelation	crosscorrelation
MultiCrossCorrelation	multi_crosscorrelation
ARMAMaxLikelihood	max_arma
GARCH	garch
ARMA.Forecast	arma_forecast
KalmanFilter	kalman
ARAutoUnivariate	auto_uni_ar
ARMAOutlierIdentification	ts_outlier_identification
AutoARIMA	auto_arima
LackOfFit	lack_of_fit
Stat - Multivariate Analysis	
FactorAnalysis	principal_components
FactorAnalysis	factor_analysis
DiscriminantAnalysis	discriminant_analysis
Dissimilarities	dissimilarities
ClusterHierarchical	cluster_heirarchical
ClusterKMeans	cluster_k_means
Stat - Survival and Reliability Analysis	
KaplanMeierEstimates	kaplan_meier_estimates

KaplanMeierECDF	n/a
LifeTables	life_tables
ProportionalHazards	prop_hazards_gen_lin
Stat - Probability Distribution Functions and Inverses	
Cdf.Binomial	binomial_cdf
Pdf.Binomial	binomial_pdf
Cdf.Geometric	geometric_cdf
InvCdf.Geometric	goemetric_inverse_cdf
Pdf.Geometric	goemetric_pdf
Cdf.Hypergeometric	hypergeometric_cdf
Pdf.Hypergeometric	hypergeometric_pdf
Cdf.Poisson	poisson_cdf
Pdf.Poisson	poisson_pdf
Cdf.DiscreteUniform	discrete_uniform_cdf
InvCdf.DiscreteUnifrom	discrete_uniform_inverse_cdf
Pdf.DiscreteUniform	discrete_uniform_pdf
Cdf.LogNormal	lognormal_cdf
InvCdf.LogNormal	lognormal_inverse_cdf
Pdf.LogNormal	lognormal_pdf
Cdf.Normal	normal_cdf
InvCdf.Normal	normal_inverse_cdf
Pdf.Normal	n/a

Cdf.Beta	beta_cdf
InvCdf.Beta	beta_inverse_cdf
Pdf.Beta	n/a
Cdf.BetaMean	n/a
Cdf.BetaVariance	n/a
Cdf.MoncentralBeta	non_central_beta_cdf
InvCdf.NoncentralBeta	non_central_beta_inverse_cdf
Pdf.NoncentralBeta	non_central_beta_pdf
Cdf.BivariateNormal	bivariate_normal_cdf
Cdf.Chi	chi_squared_cdf
InvCdf.Chi	chi_squared_inverse_cdf
Pdf.Chi	n/a
Cdf.ChiMean	n/a
Cdf.ChiVariance	n/a
Cdf.ComplementaryChi	complementary_chi_squared_cdf
Cdf.Noncentralchi	non_central_chi_sq
InvCdf.Noncentralchi	non_central_chi_sq_inv
Pdf.NoncentralChi	non_central_chi_sq_pdf
Cdf.Exponential	exponential_cdf
InvCdf.Exponential	exponential_inverse_cdf
Pdf.Exponential	exponential_pdf
Cdf.ExtremeValue	n/a

InvCdf.ExtermeValue	n/a
Pdf.ExtremeValue	n/a
Cdf.F	F_cdf
InvCdf.F	F_inverse_cdf
Pdf.F	n/a
Cdf.ComplementaryF	complementary_F_cdf
Cdf.NoncentralF	non_central_F_cdf
InvCdf.NoncentralF	non_central_F_inverse_cdf
Pdf.NoncentralF	non_central_F_pdf
Cdf.Gamma	gamma_cdf
InvCdf.Gamma	gamma_inverse_cdf
Pdf.Gamma	n/a
Cdf.Rayleigh	n/a
InvCdf.Rayleigh	n/a
Pdf.Rayleigh	n/a
Cdf.StudentsT	t_cdf
InvCdf.StudentsT	t_inverse_cdf
Cdf.ComplementaryStudentsT	complementary_t_cdf
Cdf.NoncentralstudentsT	non_central_t_cdf
InvCdf.NoncentralstudentsT	non_central_t_inv_cdf
Pdf.NoncentralStudentsT	non_central_t_pdf
Cdf.Uniform	n/a

InvCdf.Uniform	n/a
Cdf.Weibull	n/a
InvCdf.Weibull	n/a
Pdf.Weibull	n/a
Cdf.Pareto	pareto_cdf
InvCdf.Pareto	n/a
Pdf.Pareto	pareto_pdf
Cdf.Logistic	n/a
InvCdf.Logistic	n/a
Pdf.Logistic	n/a
InverseCdf	n/a
Stat - Random Number Generation	
Random.Multiplier	random_option
Random.ctor	random_seed_set
Random.Skip	random_substream_seed_get
MersenneTwister	random_MT32_init
MersenneTwister.ctor	random_MT32_table_set
MersenneTwister64	random_MT64_init
MersenneTwister64.ctor	random_MT64_table_set
Random.NextDouble	random_uniform
Random.NextDouble	random_uniform
Random.NextBinomial	random_binomial

Random.NextGeometric	random_geometric
Random.NextHypogeometric	random_hypergeometric
Random.NextLogarithmic	random_logarithmic
Random.NextNegativeBinomial	random_neg_binomial
Random.NextPoisson	random_poisson
Random.NextBeta	random_beta
Random.NextChiSquared	random_chi_squared
Random.NextCauchy	random_cauchy
Random.NextExponential	random_exponential
Random.NextExtremeValue	n/a
Random.NextF	n/a
Random.NextExponentialMix	random_exponential_mix
Random.NextGamma	random_gamma
Random.NextLogNormal	random_lognormal
Random.NextNormalAR	random_normal
Random.NextNormal	random_normal
Random.NextRayleigh	random_weibull
Random.NextStudentsT	random_student_t
Random.NextTriangular	random_triangular
Random.NextVonMises	random_von_mises
Random.NextWeibull	random_weibull
Random.nextZigguratNormalAR	random_normal

Random.NextMultivariateNormal	random_normal_multivariate
Random.NextGaussianCopula	random_mvar_gaussian_copula
Random.NextStudentsTCopula	random_mvar_t_copula
Random.CanonicalCorrelation	cannonical_correlation
FaureSequence.NextPoint	faure_next_point
Stat - Data Mining	
NaiveBayesClassifier	naive_bayes_trainer
NaiveBayesClassifier	naive_bayes_classification
Network	mlff_network
FeedForwardNetwork	mlff_network
Layer	NN_Layer
InputLayer	NN_Layer
HiddenLayer	NN_Layer
OutputLayer	NN_Layer
Node	NN_Node
InputNode	NN_Node
Perceptron	NN_Node
OutputPerceptron	NN_Node
Activation	NN_Node
Link	NN_Link
Trainer	mlff_network_trainer
QuasiNewtonTrainer	mlff_network_trainer

LeastSquaresTrainer	mlff_network_trainer
EpochTrainer	mlff_network_trainer
FeedForwardNetwork	mlff_network_forecast
Trainer	mlff_classification_trainer
QuasiNewtonTrainer	mlff_classification_trainer
LeastSquaresTrainer	mlff_classification_trainer
BinaryClassification	mlff_pattern_classification
MultiClassification	mlff_pattern_classification
ScaleFilter	scale_filter
TimeSeriesFilter	time_series_filter
TimeSeriesClassFilter	time_series_class_filter
UnsupervisedNominalFilter	unsupervised_nominal_filter
UnsupervisedOrdinalFilter	unsupervised_ordinal_filter

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