Features and Technical Specification

Introduction:

Risk Simulator is analytical software that performs Monte Carlo risk simulations, bizstats, stochastic forecasting and predictive modeling, decision analytics, business statistics, dynamic simulated decision trees, and portfolio optimization. It's a official toolkit for teaching Certification in quantitative risk management.

Major Enhancement for Risk Simulator 2023

Compatibility

- Windows 10 and Windows 11 running Excel 2016, 2019, or 365

Post-Hoc Tests

- ANOVA Post Hoc Tests and standalone post hoc tests
- Multiple Regression Post Hoc Tests

Convolution Simulation

- Poisson-Lognormal (Risk Simulator's Set Input Assumptions)
- Poisson-Normal (Risk Simulator's Set Input Assumptions)
- Discrete Normal with Lognormal (Risk Simulator's BizStats)
- Poisson with Frechet (Risk Simulator's BizStats)
- Poisson with Gumbel Max (Risk Simulator's BizStats)
- Poisson with Lognormal (Risk Simulator's BizStats)
- Poisson with Normal (Risk Simulator's BizStats)
- Poisson with Pareto (Risk Simulator's BizStats)
- Poisson with Weibull (Risk Simulator's BizStats)

Artificial Intelligence and Machine Learning algorithms

- AI Machine Learning: Bagging Linear Fit Bootstrap (Supervised)
- AI Machine Learning: Bagging Nonlinear Fit Bootstrap (Supervised)
- AI Machine Learning: Classification and Regression Trees CART (Supervised)
- AI Machine Learning: Classification with Gaussian Mix & K-Means Segmentation (Unsupervised)
- AI Machine Learning: Classification with K-Nearest Neighbors (Supervised)
- AI Machine Learning: Classification with Phylogenetic Trees & Hierarchical Clustering (Unsupervised)
- AI Machine Learning: Classification with Support Vector Machines SVM (Supervised)
- AI Machine Learning: Custom Fit Model (Supervised)

- AI Machine Learning: Dimension Reduction Principal Component Analysis (Unsupervised)
- AI Machine Learning: Dimension Reduction Factor Analysis (Unsupervised)
- AI Machine Learning: Ensemble Common Fit (Nonlinear) (Supervised)
- AI Machine Learning: Ensemble Complex Fit (Nonlinear) (Supervised)
- AI Machine Learning: Ensemble Time-Series (Supervised)
- AI Machine Learning: Linear Fit Model (Supervised)
- AI Machine Learning: Multivariate Discriminant Analysis (Linear) (Supervised)
- AI Machine Learning: Multivariate Discriminant Analysis (Quadratic) (Supervised)
- AI Machine Learning: Neural Network (Supervised)
- AI Machine Learning: Logistic Binary Classification (Supervised)
- AI Machine Learning: Normit Probit Binary Classification (Supervised)
- AI Machine Learning: Random Forest (Supervised)
- AI Machine Learning: Segmentation Clustering (Unsupervised)

Existing Features and Modules:

Monte Carlo Simulation

- Distributional Correlations with Copulas
- Latin Hypercube
- Percentile Alternate Parameters
- Multidimensional Simulations

Forecasting

- Box-Jenkins ARIMA
- Auto ARIMA
- Stochastic Processes
- Time-Series Decomposition
- GARCH
- Combinatorial Fuzzy Logic Multiple Regression Analysis)

Analytical Tools

- Bootstrapping, Cluster Segmentation
- Detailed Data Diagnostics, Hypothesis Testing
- Structural Breaks
- Tornado Charts
- Sensitivity Analysis
- Statistical Analysis

Optimization

- Static, Dynamic and Stochastic Optimization
- Continuous, Discrete and Integer Decision Variables
- Efficient Frontier
- Genetic Algorithm

Probability Distributions

- Arcsine, Bernoulli, Beta, Beta 3, Beta 4, Binomial, Cauchy, Chi– Square, Cosine, Custom, Discrete Uniform, Double Log, Erlang, Exponential, Exponential 2, Fdistribution, Gamma, Geometric, Gumbel Max, Gumbel Min, Hypergeometric, Laplace, Logistic, Lognormal (Arithmetic) And Lognormal (Log), Lognormal 3 (Arithmetic) And Lognormal 3 (Log), Negative Binomial, Normal, Parabolic, Pareto, Pascal, Pearson V, Pearsonvi, Pert, Poisson, Power, Power 3, Rayleigh, T And T2, Triangular, Uniform, Weibull, Weibull 3