What is BestFit?

BestFit is a Windows program which finds the distribution that best fits your data. Simply import your data set into BestFit and click the Run Fit button. BestFit tests up to 28 different distribution types to find the best fit for your data. You can display results as presentation-quality graphs, or generate a full statistical report. Automatic goodness of fit testing will show you at a glance the accuracy of BestFit’s answers. BestFit is available as a stand-alone program or fully integrated with every copy of @RISK Professional and Industrial, the risk analysis and simulation add-in for Excel.

BestFit in Industry

Who should use BestFit? Anyone who works with data can use BestFit. Apply it to business situations such as actuarial or claims adjustment, or to science and engineering problems such as oil well drilling or time between events. You can import data from your spreadsheet and export the results as graphic files to your report or presentation.

So why fit distributions to data? Because if you don't (or if you select the wrong distribution), any analysis you run could have serious errors that can cost you time and money. If your data was generated by a random process, you'll get the best modeling results possible by accurately describing that process. And the best way to do that is with a fitted probability distribution.

Using BestFit

How easy is BestFit to use? There are two basic steps:

Step 1: Bring in Your Data

BestFit can take data in three formats: sample, density, or cumulative. How much data? Up to 100,000 data points! You can have BestFit read in data from a text file, enter data by hand, or cut and paste data from any Windows application. You can fit data from the results of an @RISK simulation simply by choosing the Fit command from the Explorer list pop-up menu in the @RISK Results Window. Do you keep your data in Excel? Using BestFit with @RISK Professional, simply highlight your data set in Excel, right click, and choose Fit Distributions to Data from the pop-up menu. This links your data range directly to BestFit. When the data in your spreadsheet changes, BestFit updates your fits automatically!

Step 2: Click the Run Fit button

Start fitting using default settings by clicking the Run Fit button on the BestFit toolbar. BestFit tests up to 28 continuous and discrete distributions to determine which distribution best fits your data.

BestFit determines the optimal parameters for each distribution, performing three standard tests to determine the goodness of fit: Chi-squared, Anderson-Darling (A-D) and Kolmogorov-Smirnov (K-S). When BestFit is finished, the distributions fit are listed in order of goodness of fit.
Distributions available in BestFit include:

| BetaGeneral | Gamma | Lognormal | Pearson Type VI |
| Binomial    | Geometric | Lognormal2 | Poisson |
| Chi-Square  | Hypergeometric | Negative Binomial | Rayleigh |
| Error Function | Inverse Gaussian | Normal | Student's t |
| Erlang      | IntUniform | Pareto | Triangular |
| Exponential | Logistic | Pareto2 | Uniform |
| Extreme Value | Log-Logistic | Normal | Weibull |

View, Edit, and Draw Distributions

BestFit features a Distribution Viewing window that allows you to preview and edit 37 different continuous and discrete distribution functions. Not sure what a particular distribution looks like? Just select it from the drop-down menu and instantly see a graph of the distribution. Type in desired parameters or adjust them with spin buttons, and watch the graph update as you change parameter!

BestFit also features a pop-up Distribution Palette with thumbnail pictures of all available distribution types. Just click on the thumbnail you wish to use. Choosing distributions couldn’t be easier!

BestFit supports alternate parameters for your distributions. There may be instances where you wish to use a particular distribution function, but you don’t have enough information to determine the parameters for that distribution. For example, from experience you may know that a normal distribution best describes the net pay of an oil reservoir, but you don’t have enough information about the field to know what the mean and standard deviation of the distribution may be. You can now enter those percentile values directly, giving you even greater modeling flexibility. For example, you can use survey or historical data to estimate the 10th and 90th percentiles of a normal distribution instead of guessing at the mean and standard deviation. You can even use a combination of standard and percentile parameters.

BestFit also features a Distribution Artist to let you draw distribution curves freehand with your mouse. In the absence of data, this is a very powerful feature. Simply enter minimum and maximum values, then use the mouse to sketch your curve in between. Stretch the curve up or down at any point when you want to change its shape. A smoothing function helps those shaky hands. Done with your newly created masterpiece? BestFit changes your drawn curve to a General function.

BestFit can also calculate the standard distribution type and parameter values that "fit" your curve the best! All you have to do is click the Fit Curve button in the BestFit toolbar and use the resulting distribution function in your model!

How BestFit Works

BestFit’s goal is to find the distribution that best fits your input data. BestFit does not produce an absolute answer, it identifies a distribution that most likely produced your data.

For a given distribution, BestFit looks for the parameters of the function that optimize the goodness of fit, a measurement of the probability that the input data was produced by the given distribution. Always evaluate your BestFit results quantitatively and qualitatively, examining both the comparison graphs and statistics before using a result.

BestFit goes through the following steps when finding the best fit for your input data:

- For input sample data, parameters are estimated using maximum-likelihood estimators. For density and cumulative data, the method of least squares is used to minimize the distance between the input curve points and the theoretical function.
- Fitted distributions are ranked using one or more fit statistics, including Chi-square, Anderson-Darling, and Komolgorov-Smirnov.
BestFit gives you all the information you need to decide which fit is the best, and whether that fit is good enough to use. All results, including graphs, statistics and distribution functions, can easily be transferred to other programs for further analysis and presentation.

**Stunning Graphs**

High resolution graphics are used to present the results from your BestFit run. Comparison, Difference, Probability-Probability (P-P) and Quantile-Quantile (Q-Q) graphs are all available. All graphs feature sliding delimiters to easily view specific probabilities or axis values. Want to compare a probability value for your input data and a fitted distribution? Simply slide the delimiter on the graph and see the calculated probabilities both on the graph and in the linked statistical report. Graph types and formatting can be quickly changed using toolbar icons, and rescaling is done by dragging axis limits directly on your graph. Change titles, colors, and more! All graphs can be displayed in Excel for further enhancement and hard copy. With BestFit, it’s easy to clearly and effectively communicate complex results to others.

**Detailed Statistics and Goodness of Fit Reports**

BestFit generates full statistics and goodness of fit data for your fits in convenient tabbed reports linked to the active graph. Detailed statistics such as mean, variance, skewness, kurtosis and more are reported for the input data and resulting distribution. In addition, BestFit gives you access to full goodness of fit results for all three statistical tests (Chi-Square, A-D, and K-S). BestFit results are used with @RISK Professional and Industrial for Excel, and can also be used with @RISK for Project and RISKOptimizer. With BestFit, all your simulations can take into account real-world data, giving you more accurate results!

**Fit Summary Gives you Critical Values, Target Values and More!**

In addition to the Statistics and Goodness of Fit tabs, BestFit can generate a comprehensive Fit Summary report. This report gives you, in convenient spreadsheet format, formulas, parameters, full statistics, and goodness of fit data for all fitted distribution functions. Plus, it displays Target Values and Critical Values for each distribution tested. Target Values tell you the probability of achieving a specific outcome, and Critical Values identify the criteria by which BestFit accepts or rejects a fit. These Critical Values can be used to determine how good a fit BestFit has found.

**Customize Your Fits**

Want to have more control over BestFit? You can tell BestFit which distributions you want it to try. BestFit also gives you full control over Chi-squared calculations, including equal interval binning, equal probability binning, and full custom binning. Furthermore, you can select pre-defined distributions with preset parameter values to fit. By giving you access to all these controls, BestFit allows you to tailor your fits to more precisely meet your needs. However, if you don’t use all these features, BestFit will run fits automatically for you!

**Get Up to Speed Fast!**

BestFit comes with a complete on-line help system that uses an intuitive “How Do I?” interface. Simply type in what you want to do, or search the comprehensive index. Furthermore, the BestFit manual is written in plain, easy-to-understand English. If you would like further resources, Palisade carries a number of excellent titles on statistical fitting, including Risk Analysis: A Quantitative Guide, Simulation Modeling and Analysis and Statistical Distributions. And, Palisade offers ongoing seminars on how to use BestFit to analyze your data for use in @RISK, PrecisionTree, and other models! Visit www.palisade.com for the latest schedule.
Summary of Features

- Fits to sample, density, or cumulative data
- Takes data from text files, other Windows applications, Excel, or @RISK
- Input up to 100,000 data points or pairs
- Direct link to spreadsheet data in Microsoft Excel for automatic updating of fits when data changes
- Direct link to @RISK functions for automatic updating
- Filtering to remove outliers from data
- Fits to 28 available distribution functions
- Parameter selection using maximum-likelihood estimators and method of least squares
- Uses three goodness of fit tests: Chi-square, Anderson-Darling, and Komolgorov-Smirnov
- Complete statistics report, including goodness of fit, confidence levels, percentile and target values
- Presentation-quality graphs displayed in BestFit or transferred automatically to Excel’s native format
- Sliding delimiters on all graphs make finding probabilities and target values easy
- Ability to have multiple data sets and fits in a single project
- Fit to custom list of predefined distributions you specify
- Full control over Chi-square calculations
- Preview and edit distributions
- Distribution Palette gallery of distributions
- Alternate percentile parameters for distributions
- Draw distributions freehand and fit them to standard distributions
- On-line Help with “How Do I?” interface
- Familiar Office-style interface makes BestFit easy to use
- Only $395!

Use With Other Palisade Software!

BestFit was designed to work with our other DecisionTools Suite products — TopRank®, RISKview™, @RISK and PrecisionTree®. Start by using TopRank, the What-If Analysis add-in for Excel, to identify the critical values in your model. Next, in @RISK, the Risk Analysis and Simulation add-in for Excel, describe your uncertain values using probability distribution functions. Use RISKview to preview distributions or create one by simply drawing it and placing it directly in @RISK. Take real-world data and use BestFit to find the distribution which best fits your data, and use that function in @RISK to realistically represent uncertainty. Then run a thorough Monte Carlo simulation and analyze the results! Create a decision tree with PrecisionTree to accurately describe a decision, and use @RISK to perform a Monte Carlo simulation on your decision tree! With the DecisionTools Suite, you will be prepared to face the risks in any situation!

BestFit also works with RISKOptimizer™ and @RISK for Project. Use BestFit to find the best distribution for your data sets, and insert that distribution right in your Project or RISKOptimizer models! Then run a Monte Carlo simulation on your Project schedule with @RISK for Project, or run an optimization in Excel combined with Monte Carlo simulation with RISKOptimizer! One copy of BestFit is all you need to find accurate, reliable distributions to describe your uncertainty in any model!

System Requirements: IBM PC compatible Pentium or higher; Microsoft Windows 95 or higher; 16MB RAM free.
Recommended: 32MB RAM installed.

Pricing and Availability: $395; network, corporate, and academic pricing available.

Version: 4.5

Technical Support: First 30 days free, then available through Maintenance Plan

Demo: Free demo CD or disk available

Recommended Books: Simulation Modeling and Analysis, Statistical Distributions; Risk Analysis: A Quantitative Guide; Business Modelling and Simulation; Financial Models Using Simulation and Optimization