

## One-Minute Spotlight

### SEQUENTIAL SAMPLING WITH CUSTOM DISTRIBUTIONS

The probability distributions supplied with Crystal Ball are useful in a variety of modeling situations. Organizations might still want to prepare their own libraries of distributions based on data specific to their applications and situations. One such system involves libraries of stochastic information packets (SIPs), an approach set forth in the article "Probability Management" (see Sequential Sampling with SIPs; Savage, S. et al, 2006).

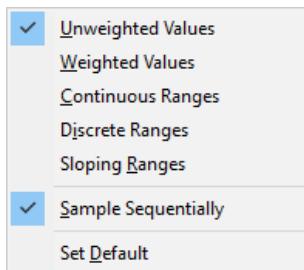
A SIP is a list of time- or order-sensitive values for a particular variable. These values are sampled as sequential trials during a Monte Carlo simulation. SIPs are used to preserve the correlation structure between SIP variables without having to explicitly compute and define a matrix of correlation coefficients.

SIPs can be represented by custom distributions in Crystal Ball and can then be published and shared by organizations using Crystal Ball's Publish and Subscribe features in the Distribution Gallery.

#### Creating Custom SIP Distributions

The easiest way to load a SIP or similar set of values into Crystal Ball is to organize the data in a single column in Excel. Then, define an assumption in Crystal Ball using a custom distribution:

1. Select a cell and choose Define, then Define Assumption.
2. Looking at the list of All distributions in the Distribution Gallery, scroll to the Custom distribution and double-click it.
3. In the Define Assumption dialog, choose Parameters, then Sample Sequentially. This also switches the parameter set to Unweighted Values.



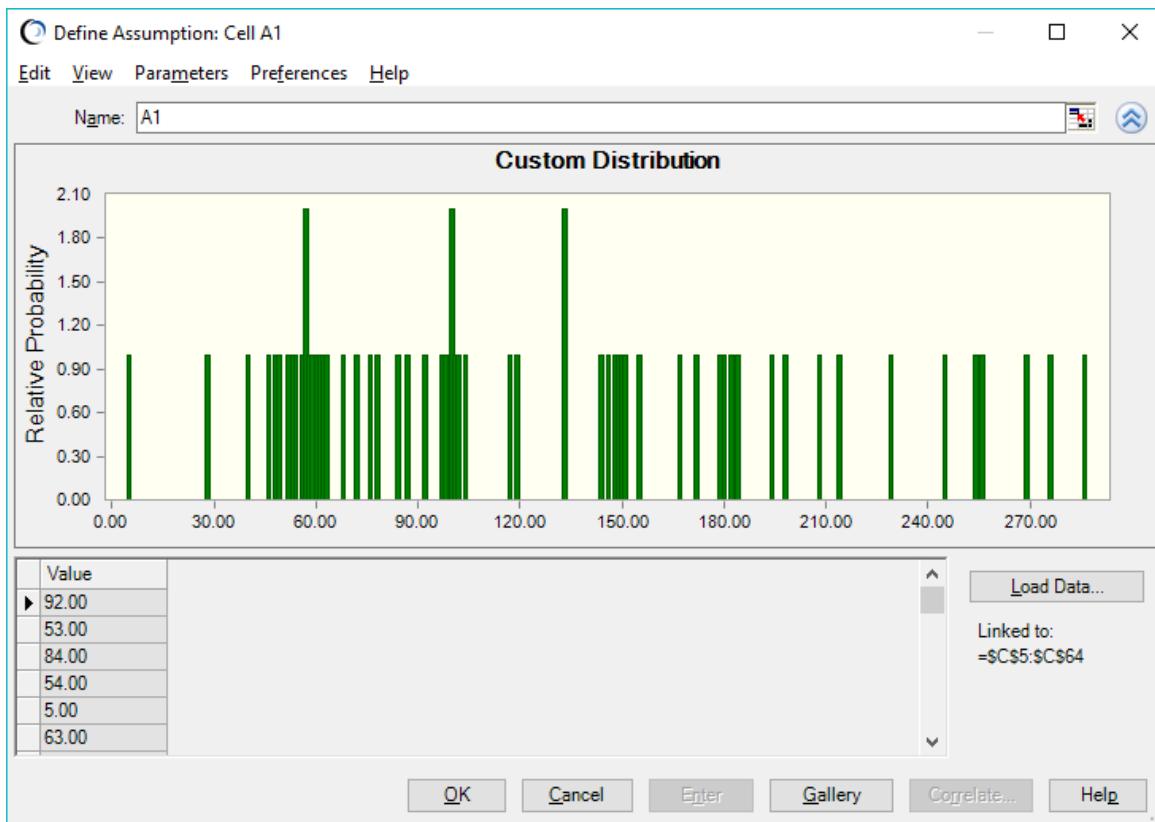
4. Click the More button, , to expand the dialog.
5. Click Load Data and enter the range of data in the Location of Data field.

You can click the cell selector icon to select the range, or you can enter a range name if one has been defined. Be sure Sample Sequentially (instead of randomly) is still checked and click OK.



## Sequential Sampling, continued

The distribution is displayed in the Define Assumption dialog.



Now, you can choose Edit, then Add to Gallery to add the SIP to a custom library (Category) in the Distribution Gallery. You can also use Publish and Subscribe on the Distribution Gallery Categories menu to share the library of SIPs with others.

## RUNNING SIMULATIONS WITH SIPS

To run a simulation with one or more SIPs, define assumptions in your model as usual, pulling in SIPs from a library (Category) in the Distribution Gallery as needed. When the simulation runs, Crystal Ball samples the SIP values sequentially instead of randomly. If the simulation has more trials than there are values in the SIP, sampling wraps around to the first value of the distribution. If you are using several SIPs with different numbers of values, a warning is displayed. You can either continue, knowing that mismatched values will be sampled together after sampling wraps for one SIP but not the other, or you can cancel the simulation and correct the problem. You can also run fewer trials so that sampling doesn't need to wrap for any SIP.

Correlations are not allowed for assumptions defined as SIPs, since the correlation structures are implicitly defined for them. Warnings are displayed if correlations are defined for them.

Two Crystal Ball Developer Kit calls, CB.DefineAssumND and CB.GetAssum, support the new parameter for sequential sampling. The Developer Kit constant is called cbAsmIsSequential, a Boolean type.

Sequential Sampling, continued

For more information or to contact us, browse to

<http://www.oracle.com/technetwork/middleware/crystalball/overview/index.html>.