

## The Uniform distribution

The Uniform distribution is called so because its density function is constant over its range. The range of the distribution is a bounded interval of real numbers. The probability of getting a value within a specific subinterval of the range, is equal to the length of the subinterval divided by the length of the range. Thus, clearly a uniform distribution is uniquely determined by its range, i.e., its 0%-fractile and its 100%-fractile.

In the Uniform distribution the key numbers, "a", "b" and "c" are interpreted as follows:

"a"  
=  
The 0%-fractile.

"b" = The 50%-fractile

"c"  
=  
The 100%-fractile.

To get a sensible distribution, the specified values must satisfy:

$$"a" < "b" < "c"$$

DynRisk will reorder the numbers if they do not satisfy these requirements. After the reordering, only "a" and "c" are used to fit the Uniform distribution. Specifically the range of the distribution is chosen to be the interval from "a" to "c". The "b" value is adjusted so that it becomes equal to the 50%-fractile of the fitted distribution, i.e., the arithmetical mean of "c" and "a".

Assume e.g., that the following key numbers are specified:

$$\begin{aligned} "a" &= -0.5 \\ "b" &= 1.0 \\ "c" &= 3.5 \end{aligned}$$

Since these numbers are ordered as they should, there is no need for any reordering. The Uniform distribution ranging from (-0.5) to 3.5 is chosen. Finally the "b" value is adjusted from 1.0 to:

$$"b" = (3.5 + (-0.5)) / 2 = 1.5$$