Answer on Question #82167 – Math – Statistics and Probability

Question

Given the mean and variance of a compound lognormal distribution how do I back transform the lognormal values to get the mean and variance

Solution

If we denote the mean and the variance of a log-normal distribution by μ and σ and the mean and the variance of the corresponding normal distribution by m and v, then this two sets of parameters are related as

$$\mu = \ln\left(\frac{m}{\sqrt{1+\frac{v}{m^2}}}\right) \qquad \sigma^2 = \ln\left(1+\frac{v}{m^2}\right)$$

Thus

$$m = e^{\mu+\frac{1}{2}\sigma^2} \qquad v = \left(e^{\sigma^2}-1\right)e^{2\mu+\sigma^2}$$

Answer: $m = e^{\mu+\frac{1}{2}\sigma^2},\ v = \left(e^{\sigma^2}-1\right)e^{2\mu+\sigma^2}$.