

Estimate of the elapsed period t

We can estimate the period t that has elapsed if we know λ and the number of events a that have occurred in time t . The mathematics are exactly the same as the estimate for λ . The reader may like to verify that, by using a prior of $p(t) = 1/t$ we obtain a posterior distribution: $t = \text{Gamma}(1/a)$ which is the same result we would obtain if we were trying to predict forward (i.e. determine a distribution of variability of) the time required to observe a events given $\lambda = 1/t$. Also, if we can reasonably describe our prior belief of the elapsed period t with a [Gamma](#)(b, a) distribution, the posterior is given by a $\text{Gamma}(b/(1+a), 1+a)$ distribution.

Note that here we use the parameterization $\text{Gamma}(b, a)$ where $b = \text{Scale}$ and $a = \text{Shape}$, whereas in other sections of ModelAssist we might report a three-parameter version of the Gamma distribution.
