Manual Likelihood

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The likelihood of the sample `c(3,2,2,2)`:

Let

$$(t_1, \ldots, t_4) = c\left(0, \frac{1}{9}, \frac{1}{9} + \frac{1}{16}, \frac{1}{9} + \frac{1}{16} + \frac{1}{21}\right).$$

Defining $\lambda_{j,t} := \beta_0 * j^{\theta}(N_j - n_{j,t})\, I_t$, and setting $N_2 = 10$, $N_3 = 10$, $\beta_0 = 1$, and $\theta = 1$, we have

$$\begin{aligned} l(3,2,2,2) = &\log \lambda_{2,t_2} - \frac{1}{9}(\lambda_{2,t_2}) + \\ &\log \lambda_{2,t_3} - \frac{1}{16}(\lambda_{2,t_3}) + \\ &\log \lambda_{2,t_4} - \frac{1}{21}(\lambda_{2,t_4}) + \\ &= 3.6925 \end{aligned}$$