MATLAB exercise, ML Estimation stretch goal.

Consider a change-point model, in which observations of something (arrivals at a queue for example), are occurring according to a Poisson distribution. At some point in time *n*, this rate changes. The two rates, and the change point, are unknown quantities you wish to estimate.

Recall the Poisson distribution has the following PMF

Create a simulation of *N* = 100 observations. During the first *n* observations, the sample are drawn from a Poisson distribution with rate λ1, and after observation *n*, the rate changes to rate λ2.

1. Write the likelihood for this scenario, as a function of λ1, λ2, and *n* (the unknown parameters)
2. Take the log of the likelihood
3. By brute force(i.e. checking all possible values of *n*), determine the max-likelihood estimate for λ1, λ2, and *n*
4. Run your simulation a few times, for a few values of λ1, λ2, and *n*. Produce some plots, comment on your results.