MATH 598/782 - PROJECT 6

Please submit your project by 6.00 pm (EDT) on Friday 27th November by uploading a single pdf to myCourses.

Perform Bayesian inference for parameters (λ, μ, ω) for the mixture of Poisson distributions model based on the mass function

$$f_Y(y; \lambda, \mu, \omega) = \omega \frac{\lambda^y e^{-\lambda}}{y!} + (1-\omega)\frac{\mu^y e^{-\mu}}{y!} \qquad y = 0, 1, 2, \ldots$$

where $0 < \omega < 1$, using the data in the file

`www.math.mcgill.ca/dstephens/598-Bayes-2020/Projects/Project6.csv`

Notes:

(i) You should choose a prior distribution $\pi_0(\lambda, \mu, \omega)$ that reflects the fact that the expectation of Y is considered *a priori* to be around 5, but that observations, y, above 30 are considered very unlikely.

(ii) As will all mixture models, there is an inherent *non-identifiability* as

$$f_Y(y; \lambda, \mu, \omega) \equiv f_Y(y; \mu, \lambda, 1-\omega) \qquad \forall y.$$

You may choose to resolve this non-identifiabilty by choice of the prior distribution, or by imposing parameter constraints.