3rd exercises for SIM'2019

Ex. 1
We have 10 observations from i.i.d. Poisson model and $\bar{y} = 3.4$. Construct 95 % confidence interval for λ using asymptotic result in Eq. (2.7).

Ex. 2
We have two sets of stars, A and B, and we have observed their magnitudes. In set A we have 61 observations with mean magnitude -24.4, standard deviation is 3.9. In set B there is 71 observations, mean magnitude is -23.2 with standard deviation of 3.8. Test if the expected magnitudes could be the same in the groups.

Ex. 3
Test if hair color and color of eyes are independent. The data from 95 persons is

hair \eyes	blue	brown	other
blonde	32	14	6
dark	12	22	9

Note to Exs. 2 and 3. If your software cannot compute the cdf and inverse cdf for t-distribution you can use $\mathcal{N}(0, 1)$ instead. If you cannot compute χ^2-distribution, you can approximate it with $\mathcal{N}(\kappa, 2\kappa)$, where κ is the degrees of freedom. If you cannot compute cdf and inverse cdf values for $\mathcal{N}(0, 1)$, change the software.