Unit 7 Pre-Class Warm-up

w203 Instructional Team

Maximum Likelihood Overview

Each time Paul Laskowski attempts a joke in class, he secretly records the number of students that laugh (Sometimes, the Human Subjects Board is just in a great mood). Paul gives you a dataset of 500 jokes and insists that you model each observation as an independent random variable that's distributed according to the HyperGroussian distribution, which has a single parameter, $h \in R$. The probability density function of this distribution can be written $f_H(x; h)$.

In your own words, list the four or five key steps you would take to perform a maximum likelihood estimate of h. (Just a sentence per step)

1. First, we can write out $f_H(x; h)$ which can have different probability densities for different values of h
2. We want to define $l(h) = f_H(x; h)$ as the likelihood for each of the probabilities densities so that all values of h are accounted for.
3. Now that we have l(h) for each of the probability densities, we want to find the value of h where the partial derivative of $l(h) = 0$.
4. We take the partial derivative of h for each of the probability densities and then and equate that to 0 and solve for h.
5. Then we pick the h value that gives us the largest probability density.