

Assignment 5

Due date: December 23, 2018

Total points: 20

Submit online as a zip file.

1. You observe data $\{X_i, Y_i\}_{i=1}^N$ and you believe that
$$X_i \mid Z_i = k \sim N(\mu_k - \alpha Y_i, \sigma^2),$$
where the class label $Z_i \in \{1, \dots, K\}$ is unobserved, $P(Z_i = k) = \pi_k$. Develop the EM algorithm for estimating $\alpha, \pi_k, \mu_k, \sigma^2$. Submit this part online as a pdf file.
2. Develop an R function to fit the above mixture distribution with the following API:
`norm.mix(x, y, K = 2)`
where `x` and `y` are vectors of numeric values, `K` an integer with default value 2. The return value should be a list that contains “alpha”, “pi”, “mu”, and “sigsq”, where “pi” and “mu” are vectors of length `K`. Submit this part online with file name “HW5.R”.