

Given 4 Problem to Solve by EM Algorithm in R programming.

Question1:

Suppose we wish to find the mean μ , for data that follows the normal distribution where the known data are $\{1,5,10,4\}$. With two data items missing. Here $n=6$ and $k=4$. Suppose that we initially guess $\hat{\mu}_0 = 3$. We then use this value for the two missing values.

Question 2:

Following data with two missing values follow Poisson distribution with mean 9 (use random seed = 10). Using Expectation-Maximization (EM) algorithm, estimate μ and number of iterations needed to estimate μ . (Use your exam roll as the initial values)

Question 3:

Generate a random sample of size 20 from a Poisson distribution with mean 15. Use your examination roll as seed. Consider the last two generated values as missing. Using EM algorithm to estimate μ and σ . Comment on your estimates.

Question 4:

Generate a random sample of size 10 from an exponential distribution with mean 15. Using your examination roll number as seed. Consider the 5th and 6th generated values as missing. Using EM algorithm

- a. Estimate the minimum variance unbiased estimate of the sample mean and
- b. An unbiased estimate of the variance of the sample mean. Comment on your findings.