

Exercice1_P79

January 9, 2022

3.1 Let x be a random variable with mean m_x and variance σ_x^2 . Let x_i for $i = 1, 2, \dots, N$ be N independent measurements of the random variable x .

(a) With \hat{m}_x the sample mean defined by

$$\hat{m}_x = \frac{1}{N} \sum_{i=1}^N x_i$$

determine whether or not the sample variance

$$\hat{\sigma}_x^2 = \frac{1}{N} \sum_{i=1}^N (x_i - \hat{m}_x)^2$$

is unbiased, i.e., is $E\{\hat{\sigma}_x^2\} = \sigma_x^2$?

$$A = B$$