

Assignment: Estimation using the method of moments

We draw a sample of n elements from a continuous uniform distribution of the random variable X . Elements are distributed uniformly between the values a and b , where $a < b$.

Calculate the estimates of a and b from the sample, using the method of moments.

Hint: use the probability distribution function $\frac{1}{b-a}$ to calculate the expectation of X and X^2 , and equate them to $\bar{x} = \sum_{i=1}^n \frac{x_i}{n}$ and $\sum_{i=1}^n \frac{x_i^2}{n}$, respectively. Solve the resulting equations for a and b . (Make use of the relevant identities factorising differences of powers of b and a .)