LAB 1 - Estimators

2020/10/09

LAB 1

- Deadline: October, 20

For this lab:

- You'll solve all the exercises on the slides 4 to 8 (included) from "PART B-Applications"
- You'll include in the report all the empirical verifications that follow

EX 1: Rayleigh distribution

- (a) Estimate the parameter of the Maximum height random variable H (Rayleigh distribution).
- (b) Randomly generate more samples from the parameter estimation in (a) (assuming it is the true value of the parameter). Do it in 2 different ways.

Note: the nominal value of the true parameter is not important (you could choose your favourite positive number), we just want to verify properties of the estimator.

- (c) Empirically verify the property "unbiasedness" for the MLE estimator of the Rayleigh distribution.
- (d) Empirically verify the property "efficiency"" for the MLE estimator of the Rayleigh distribution.
- (e) Empirically verify with a plot the property "asymptotic normality" for the MLE estimator of the Rayleigh distribution.

EX 2: Geometric distribution

- (a) Estimate the fraud probability.
- (b) Generate more samples based on the estimator (assuming it is the true value of the parameter).
- (c) Empirically verify with a plot the property "asymptotic normality" for the estimator.
- (d) Compute the confidence interval and validate it with simulations.

Next course

- We'll code the EM algorithm
- We'll apply it to images