Computational Statistics II
Assignment 2: Comparison of Bootstrap confidence intervals

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Aim of this assignment is to evaluate and compare the performances of the Bootsterap confidence intervals on simulated data sets. The objective is to estimate the mean of the population.

1. Simulate data from: Student-t distribution; Uniform distribution. Choose the parameters of all distributions so that the mean is zero and the variance 1. For the Cauchy distribution, choose location = 0 and scale = 1. Choose a sample size $n = 100$. Compute the Boostrap estimates of the mean of the population and its standard error.

2. Compute the classical t-distribution confidence intervals for the mean of the popolation and the Bootstrap intervals: asymptotic normal, Bootstrap-t, percentile, and BCa.

3. Evaluate the coverage probabilities of all confidence intervals in the case $n = 100$, for the two distributions. Compare the performances of the intervals.

4. **Bonus.** Compute the BCA confidence intervals of previous point 4, and its coverage probability, and compare its performances with the previous case.