

Class 24 in-class problems, 18.05, Spring 2022

Concept questions

Concept question 1. Which stat is easiest

Consider finding bootstrap confidence intervals for

I. the mean **II.** the median **III.** 47th percentile.

Which is easiest to find?

- (a) I (b) II (c) III (d) I and II
(e) II and III (f) I and III (g) I and II and III

Board questions

Problem 1. Empirical bootstrap

Data: 3 8 1 8 3 3

Bootstrap samples (each column is one bootstrap trial):

8	8	1	8	3	8	3	1
1	3	3	1	3	8	3	3
3	1	1	8	1	3	3	8
8	1	3	1	3	3	8	8
3	3	1	8	8	3	8	3
3	8	8	3	8	3	1	1

- (a) Compute a bootstrap 80% percentile confidence interval for the mean.
(b) Compute a bootstrap 80% percentile confidence interval for the median.

Problem 2. Parametric bootstrap

Data is taken from a Binomial(8, θ) distribution. After 6 trials, the results are

6 5 5 5 7 4

- (a) Estimate θ .
(b) Write out the R code to generate data of 100 parametric bootstrap samples and compute an 80% confidence interval for θ .
(Try this without looking at your notes.)

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18.05 Introduction to Probability and Statistics

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