

Week 17 Lab Exercises

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1 Permutation test

Use the `murders` dataset from the `dslabs` R package to check whether and how the total number of murders (on a log scale) differs between the regions `West` and `South`. To do so, use a permutation test that you implement specifically for this purpose. Briefly explain your approach and describe your findings. Use a suitable statistical test to verify that your approach produces sensible results, and describe the comparison.

2 Bootstrapping

Repeat the test from the previous task by using bootstrapping. Bootstrap the difference in log murders between the South and the West. Is the difference significantly larger than zero?

3 Cross-validation

Load last week's lab analysis of the Pietryka and DeBats article. Implement k -fold cross-validation with $k = 10$ to assess the goodness of model fit in comparison for the first and the third Newport model. Using last week's analysis, demonstrate that it works and produces meaningful results.