Math 6020-1, Spring 2015; Assignment 5

Due on Friday May 8, 2015

This assignment is optional and brief. I will be happy to make comments on your work if you do it and turn it in on time. However, doing [or not doing] this will not affect your course grade.

Consider the statistical functionals

$$T_n(x_1, \dots, x_n) := \frac{1}{n} \sum_{i=1}^n (x_j - \bar{x})^2,$$

where $\bar{x} := \frac{1}{n} \sum_{i=1}^{n} x_i$. Let X_1, \ldots, X_n be an i.i.d. sample and note that $T_n := T_n(X_1, \ldots, X_n)$ is an estimator of the variance σ^2 of the population from which the sample comes.

- 1. Compute $T_{(-i)}$ for every $1 \le i \le n$.
- 2. Compute the pseudo-values \widehat{T}_i for every $1 \leq i \leq n$.
- 3. Use your computation to evaluate the jackknife estimator of σ^2 . Verify that the jackknife estimate is the bias-corrected version of T_n .