EEB 581, Problem Set Eight

Due Tuesday, 20 April 2004

Consider the following 25 data points (so save retyping, this list is also on the website as a text link)

8.26	6.33	10.4	5.27	5.35	5.61	6.12	6.19	5.2	7.01	8.74	7.78	7.02
6	6.5	5.8	5.12	7.41	6.52	6.21	12.28	5.6	5.38	6.6	8.74	

Using this data

1: Using a randomization test, what is the p value for a test that the mean $= 8$?

2: What is the jackknife estimate, its standard error, and the approximate confidence intervals for the estimated skew,

$$\widehat{S_3} = \frac{1}{n}\sum_i^n (x_i - \overline{x})^3$$

3: Using 1000 bootstrap samples, consider an estimate of the scaled kurtosis,

$$\widehat{K} = \frac{1}{n}\sum_i^n (x_i - \overline{x})^4 - 3\left(\frac{1}{n}\sum_i^n (x_i - \overline{x})^2\right)^2$$

(a) Plot the distribution of bootstrap values

(b) What is the estimated bias and the standard deviation for $\widehat{K}$?

(c) Using the results for (a), what is an approximate 95% (normally-assumption) confidence interval for K?

(d) Compute Efron's 95% confidence limit for this data.

(e) Compute Hall's 95% confidence limit for this data.

Fun **R** fact. If **x** is a vector of data, then the **R** command **`sample(x,replace=T)`** returns a sampling with replacement vector of the data in **c**, i.e., a bootstrap sample.