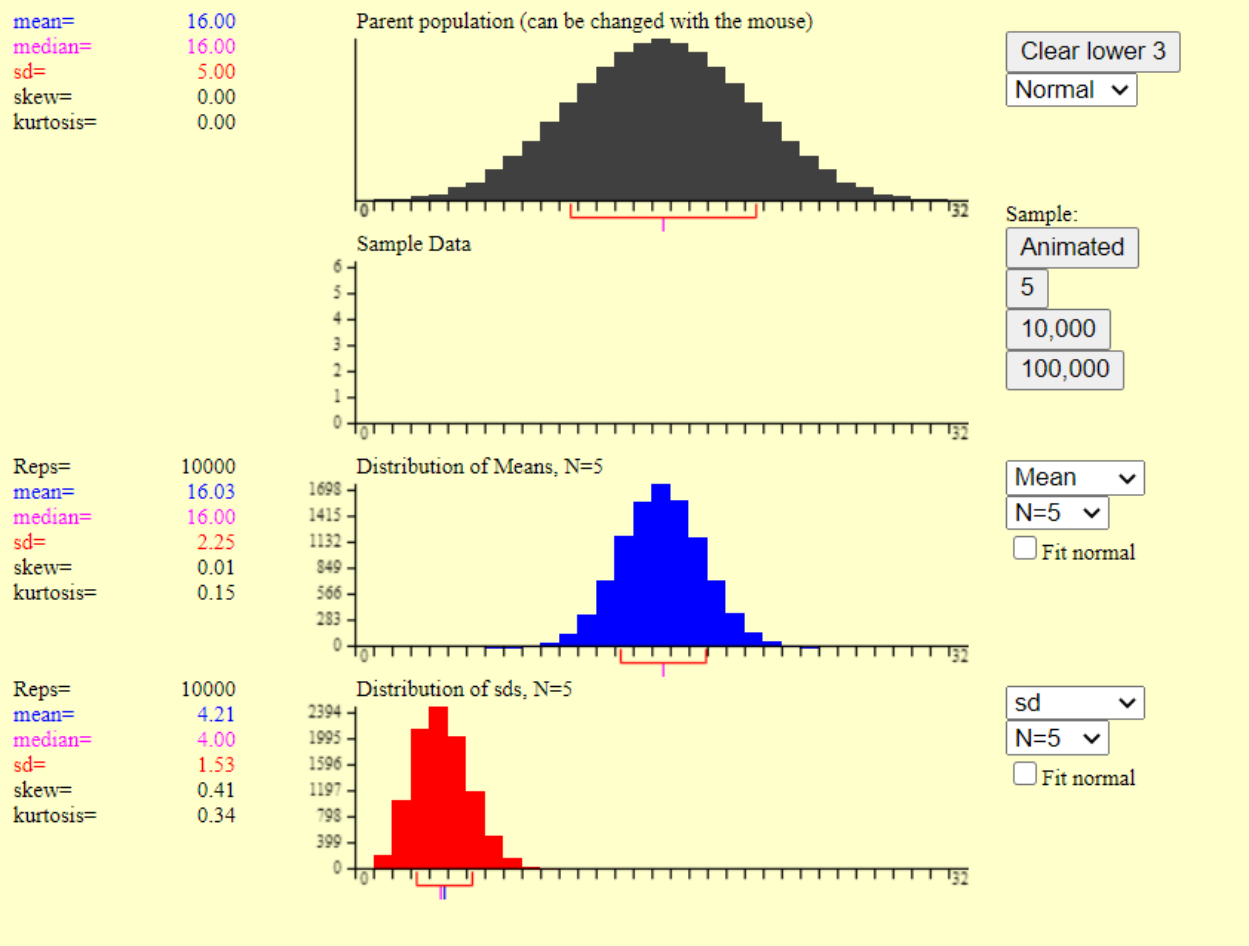
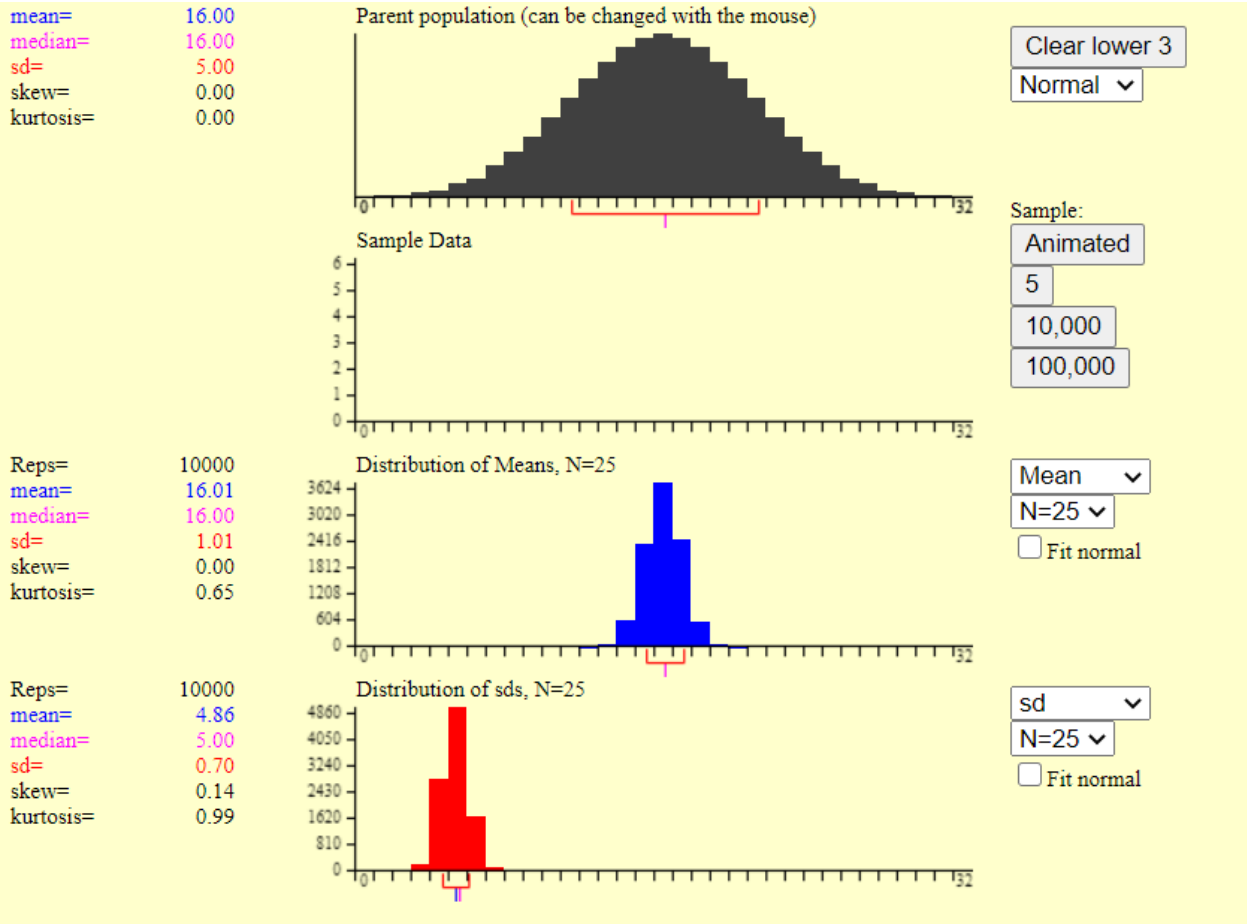
R Notebook

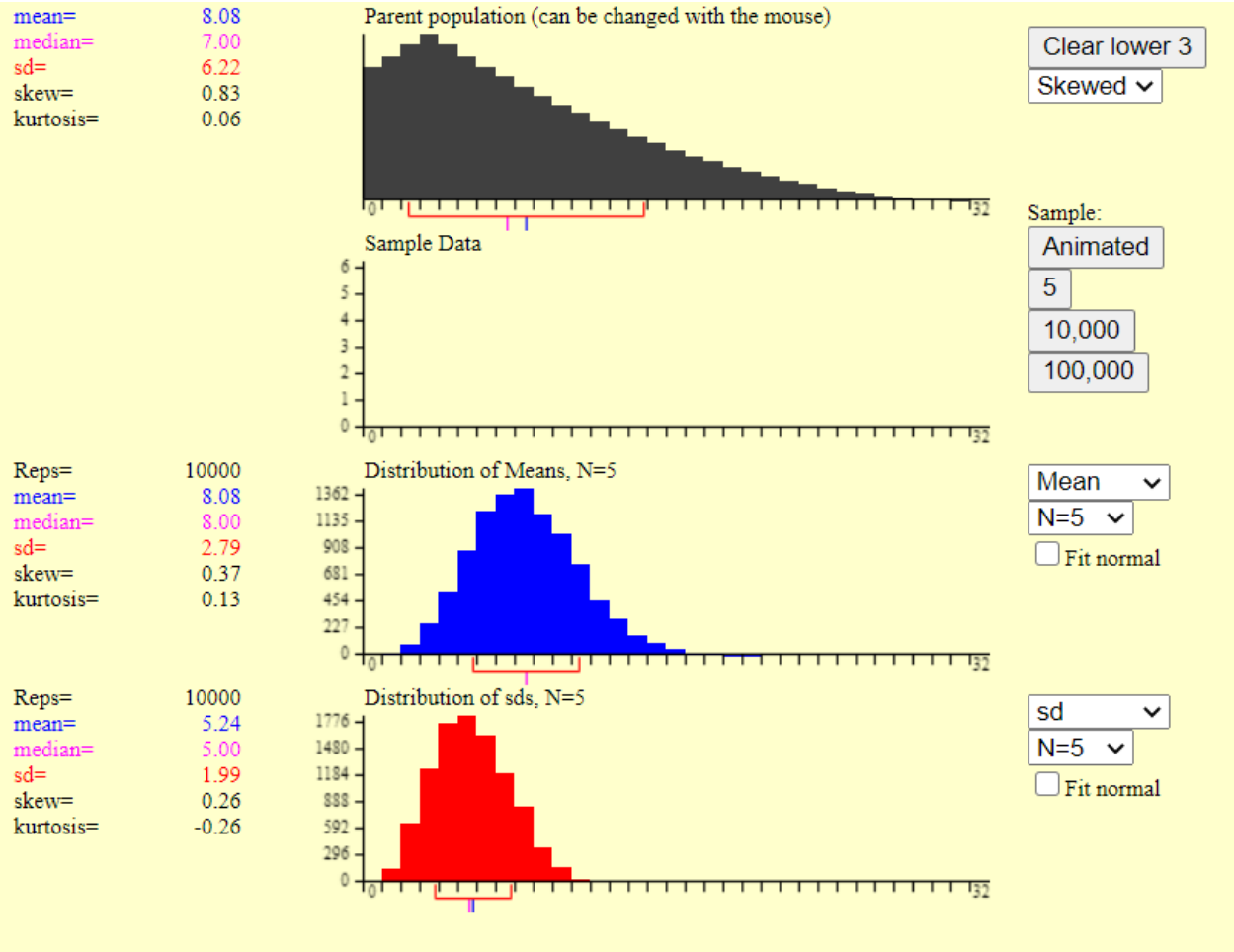
(a) Normal distribution, N=5



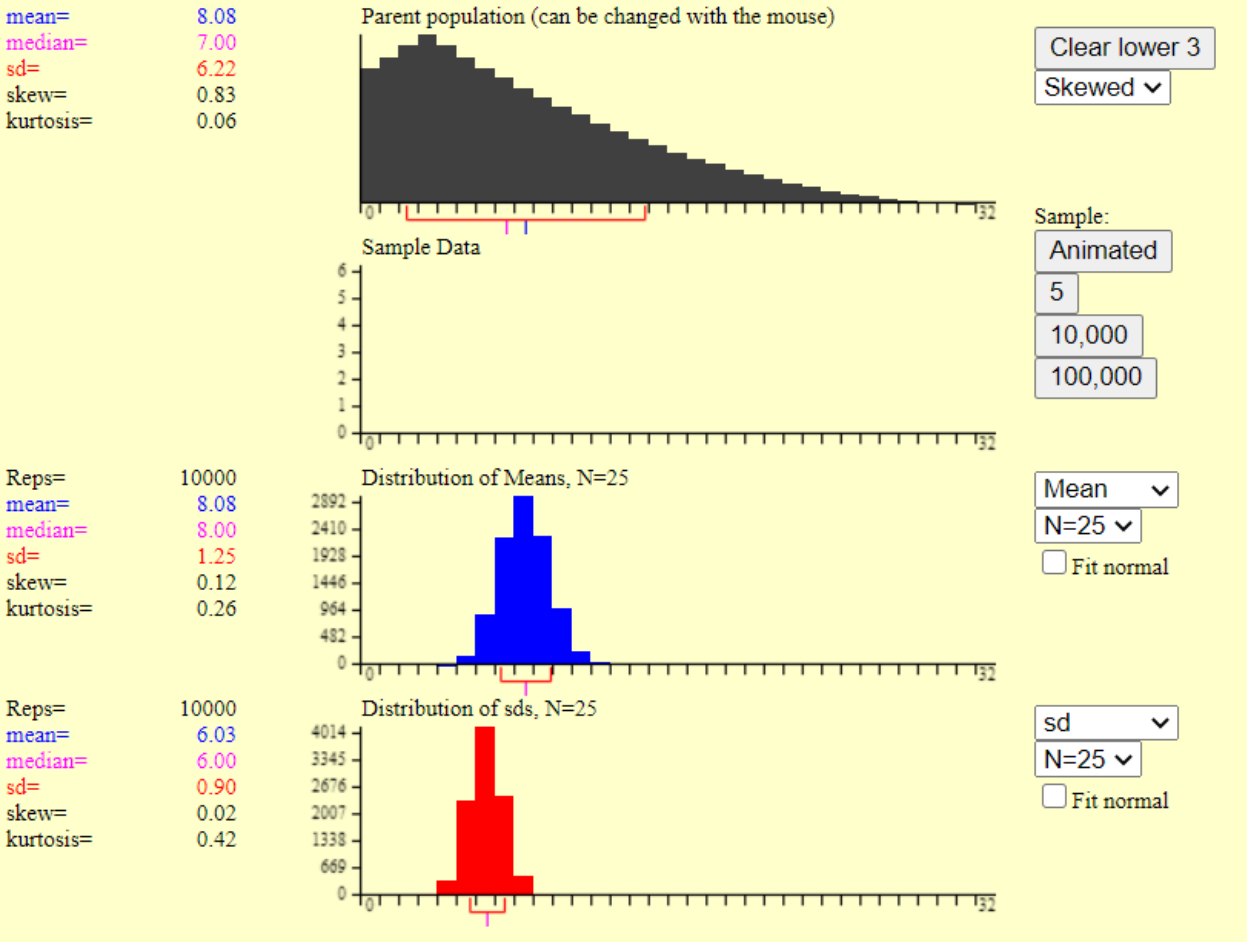
(b) Normal distribution, N=25



(c) Skewed distribution, N=5



(d) Skewed distribution, N=25



(e) Discussion

(i)

Different statistics need not have the same sampling distribution, even when computed on the same sample. For example, consider the sample mean (approximately normal, by the CLT) versus the sample maximum (approximately follows the generalized extreme value distribution, which is usually right-tailed).

(ii)

Increasing the sample size reduces the variability of the sampling distribution of a statistic.

(iii)

For small samples, the sampling distribution of the mean from a skewed distribution looks more skewed than the mean from a normal. This difference disappears when the sample gets larger.

Note: This question was hard to answer. The skew in the sampling distribution is pretty subtle with so few bins in the histogram.