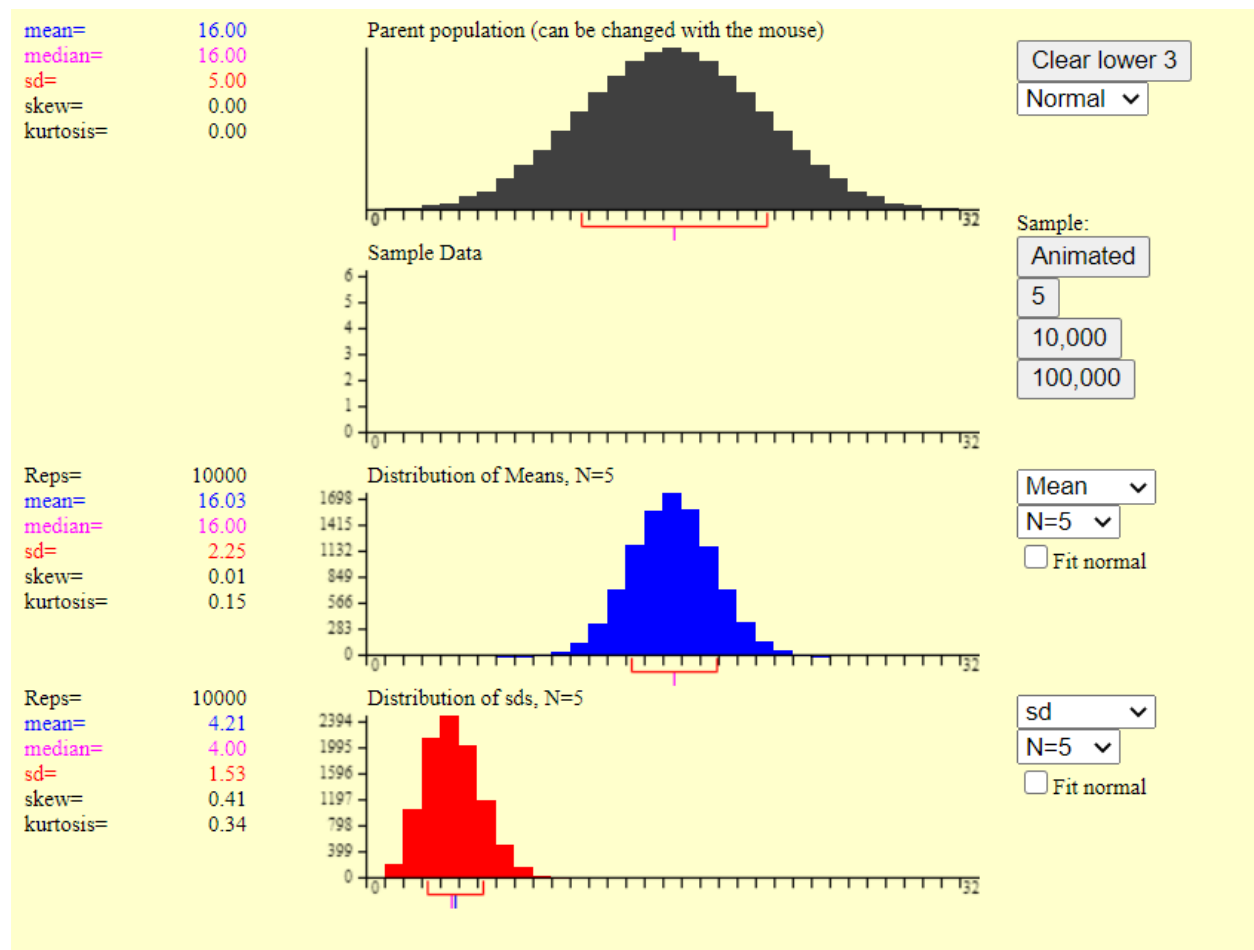


STAT452/652 Solution to HW01

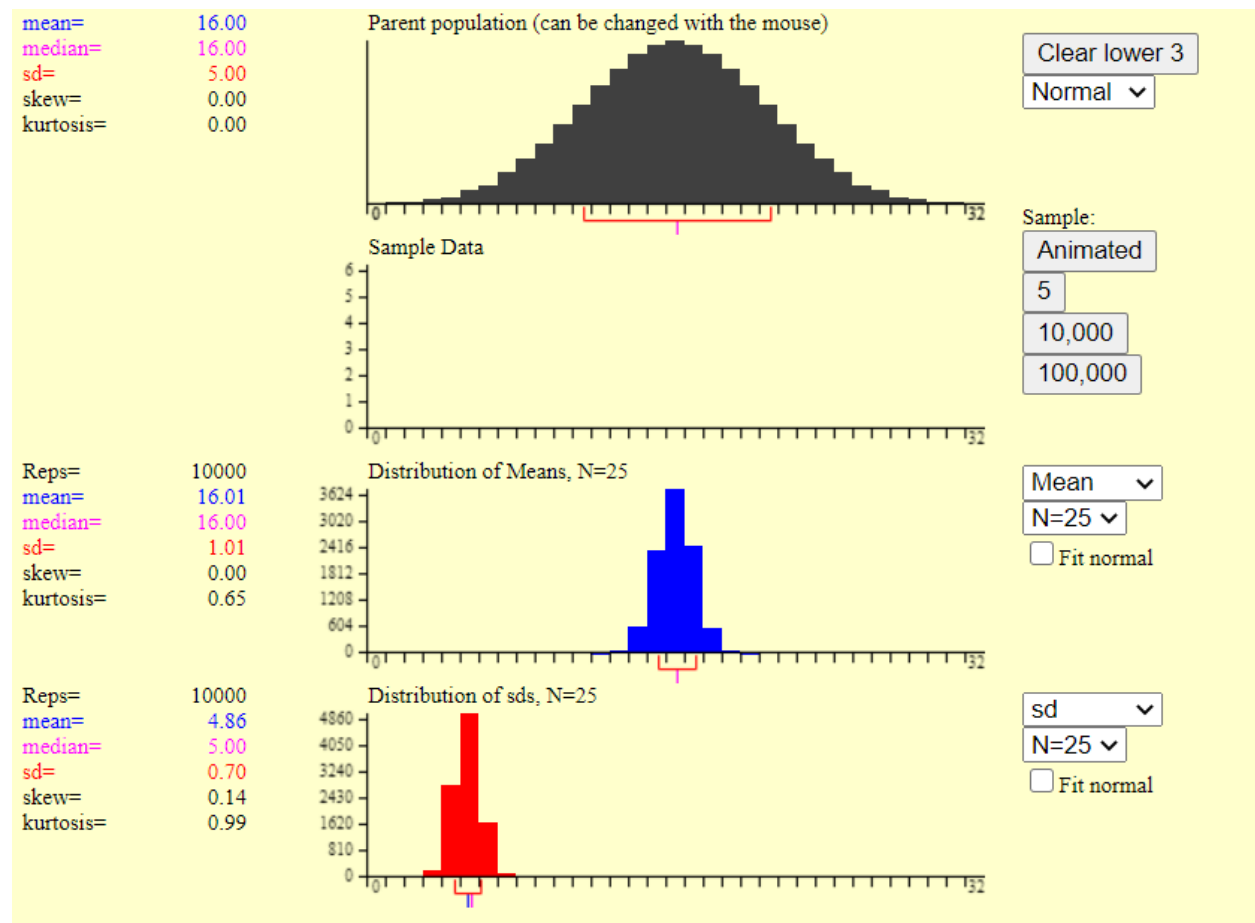
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Due on Sept 18, 2020

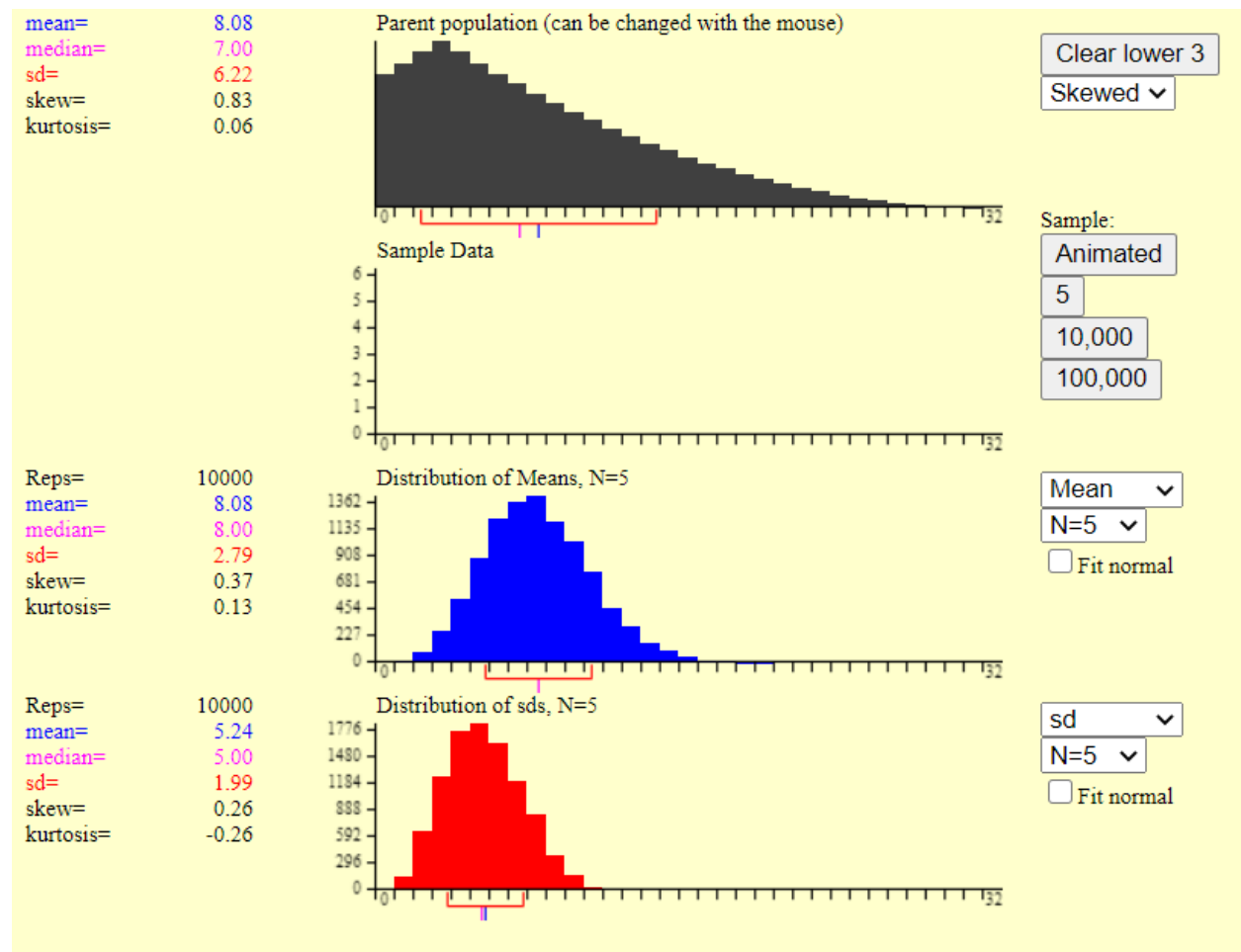
(a) Normal distribution, N=5



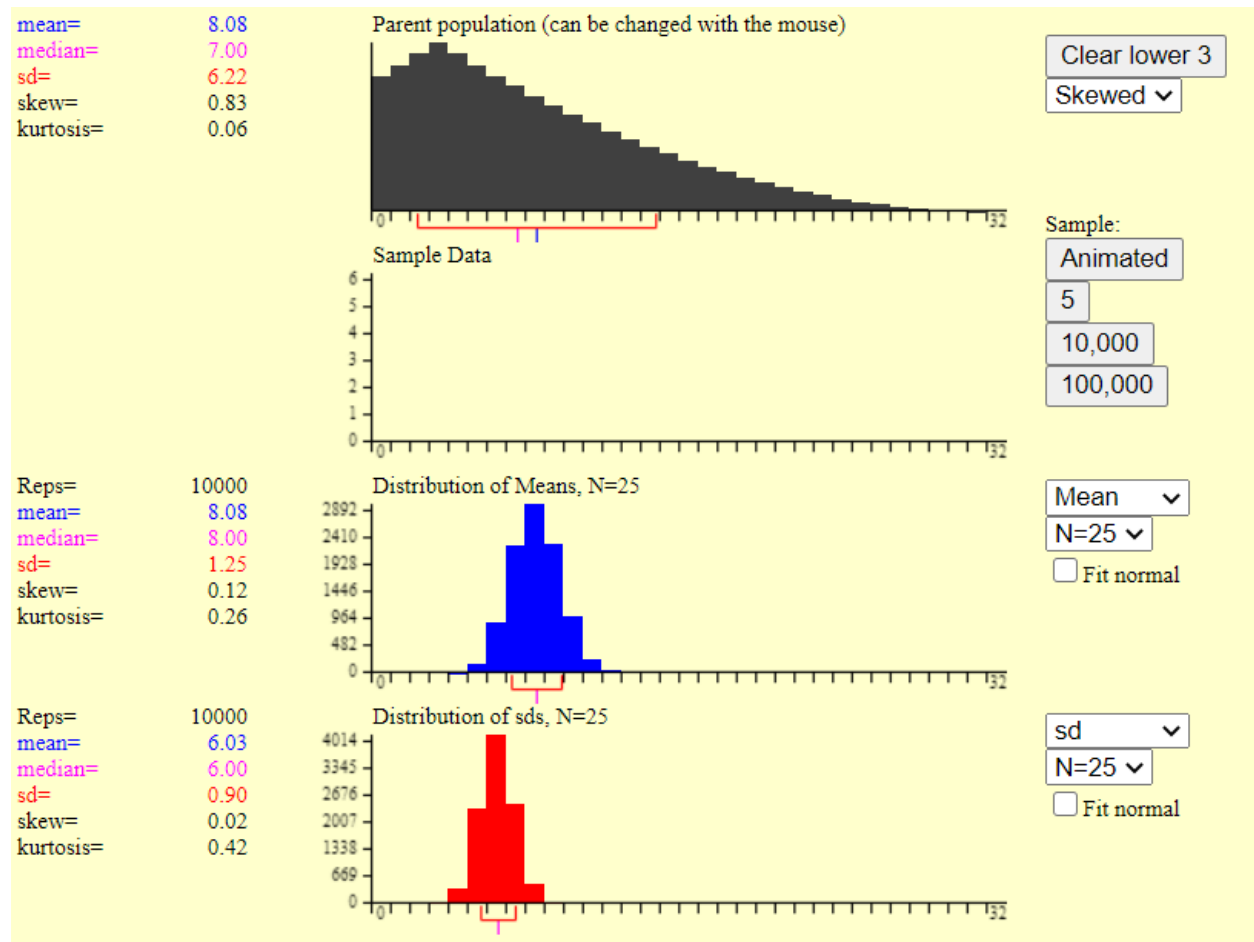
(b) Normal distribution, N=25



(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, in Part a, the distribution for the mean is very symmetric and normal-looking, but the distribution for the variance shows some right skewness.

(ii)

Increasing the sample size reduces the variability of the sampling distribution of a statistic and also makes the distribution look more normal. Both of these are evident in part (c) vs part (d).

(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 mostly 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.