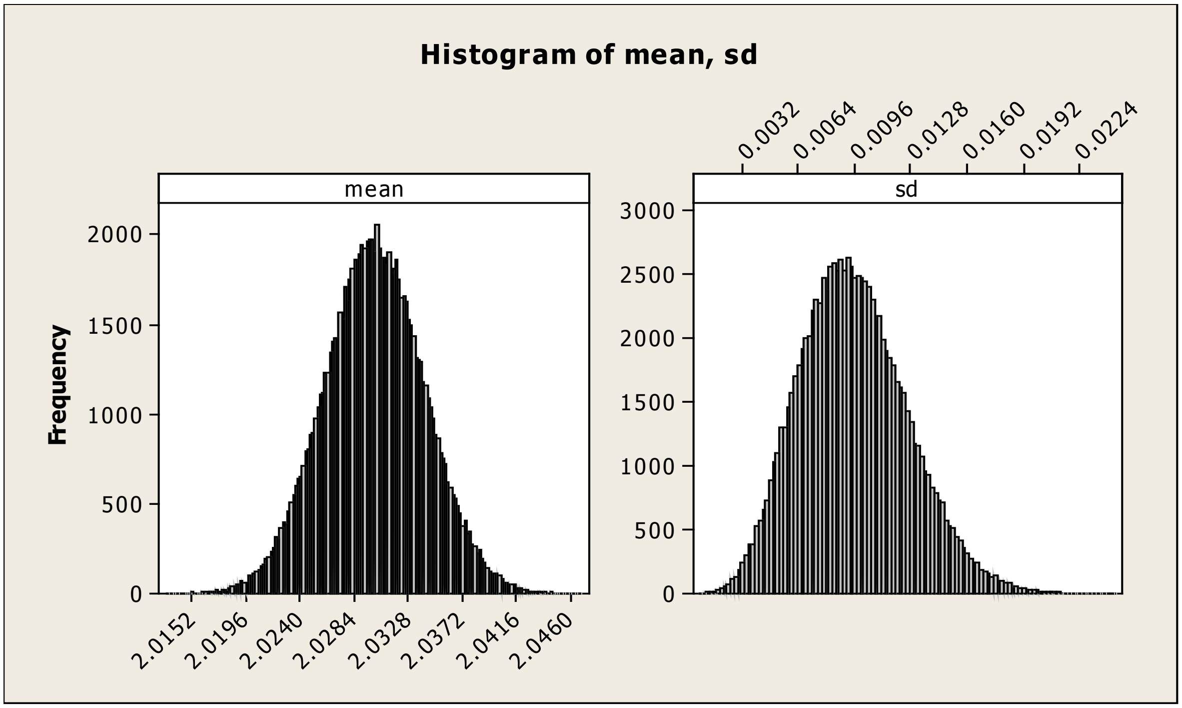
STAT203 **Simulated Z and T 95% CI's (p.352ff in text)** O'Brien, 11/1/2007

Using Minitab, we simulate 100,000 samples of size 6. Here, we know that $\mu = 2.03$ and that the numbers come from a Normal parent population. For the Z intervals, we take $\sigma = 0.01$, and we form the intervals ($\bar{x} \pm 1.96*\sigma/\sqrt{6} = \bar{x} \pm 0.008002$). For the T intervals, we use the sample SD estimate (s) from the n = 6 sample values, and we form the intervals ($\bar{x} \pm 2.5706*s/\sqrt{6} = \bar{x} \pm 1.04944s$).



Descriptive Statistics: mean, sd

Variable	N	Mean	StDev	Minimum	Median	Maximum
mean	100000	2.0300	0.00408	2.0132	2.0300	2.0469
sd	100000	0.009517	0.003068	0.000862	0.009331	0.024353

Descriptive Statistics: inthereZ, inthereT

Variable	N	Mean	StDev	Minimum	Median	Maximum
inthereZ	100000	0.95021	0.21751	0.000000000	1.00000	1.00000
inthereT	100000	0.95047	0.21697	0.000000000	1.00000	1.00000

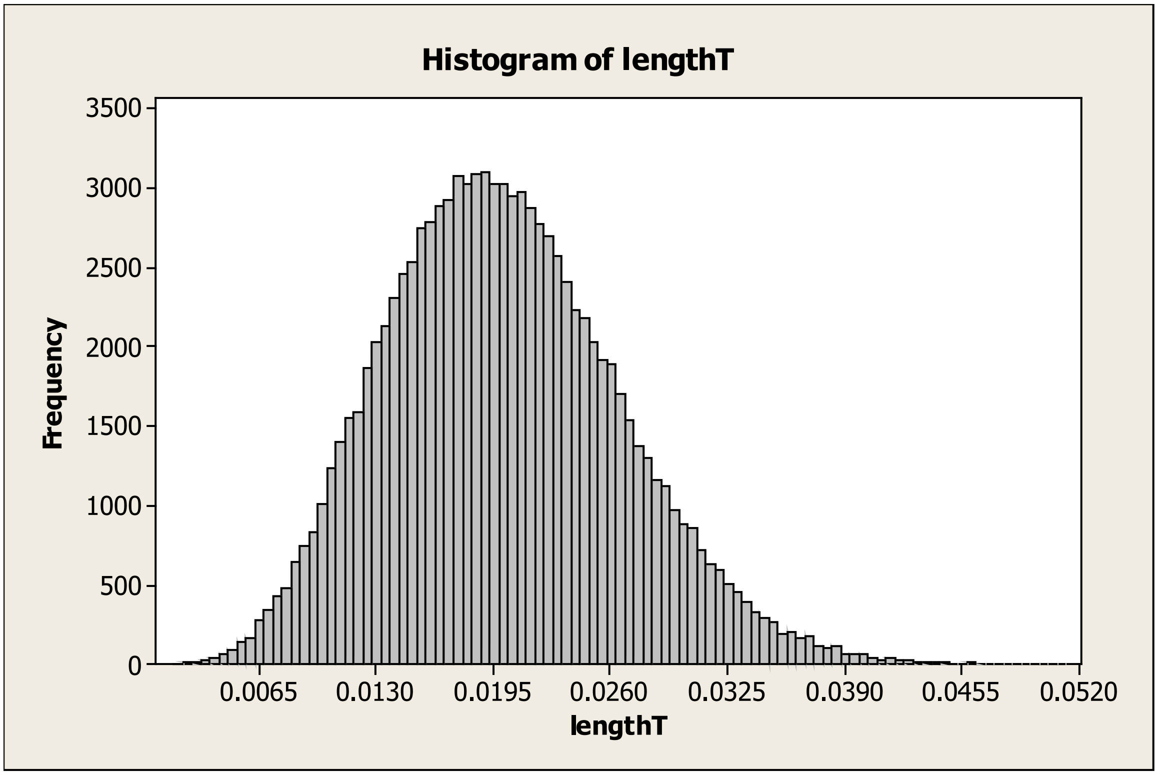
Tabulated statistics: inthereZ, inthereT

Rows: inthereZ Columns: inthereT

	0	1	All
0	2274	2705	4979
1	2679	92342	95021
All	4953	95047	100000

Cell Contents: Count

The Lengths of the 95% T CI's is 2.0989s, so not surprisingly, the following histogram of the lengths of the T CI's resembles the histogram of the SD's. The Z CI's all have the same length (0.0160033), on the other hand, since for the Z intervals the lengths ($2*1.96*\sigma/\sqrt{6}$) all use the population SD of $\sigma = 0.01$.



Descriptive Statistics: lengthT

Variable	N	Mean	StDev	Minimum	Median	Maximum
lengthT	100000	0.019975	0.006439	0.001810	0.019586	0.051114