

## Confidence Interval Simulation worksheet

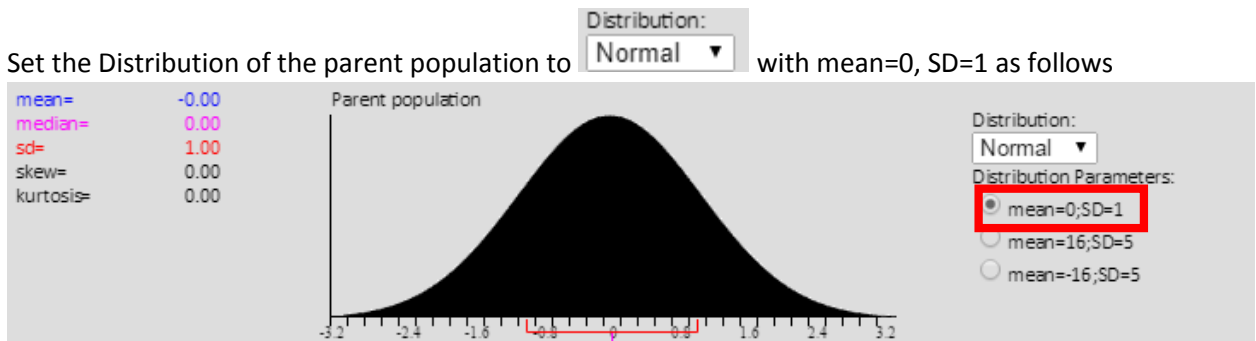
The objective of this worksheet is to illustrate concepts about confidence interval through simulation demonstration.

### Contents

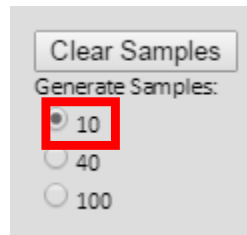
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## Sample of size 10 with 50% confidence level

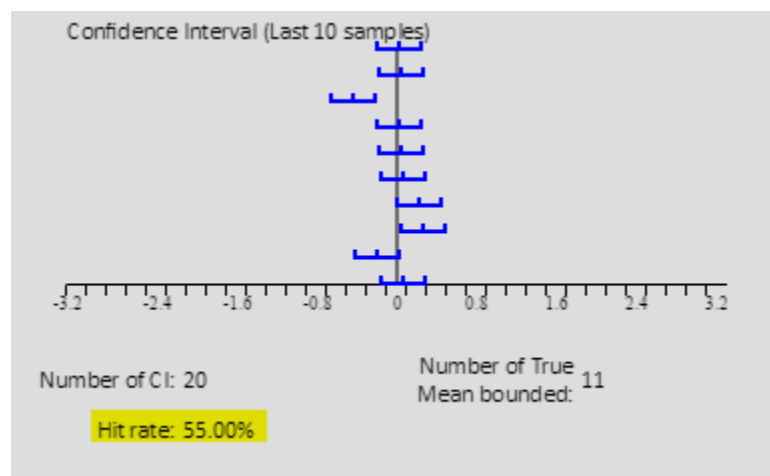
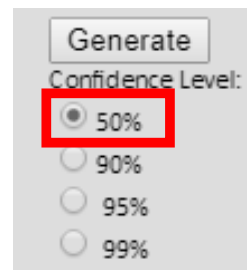
1. Set the Distribution of the parent population to **Normal** with mean=0, SD=1 as follows



2. Click **Clear Samples** and set sample size to 10 as follows:



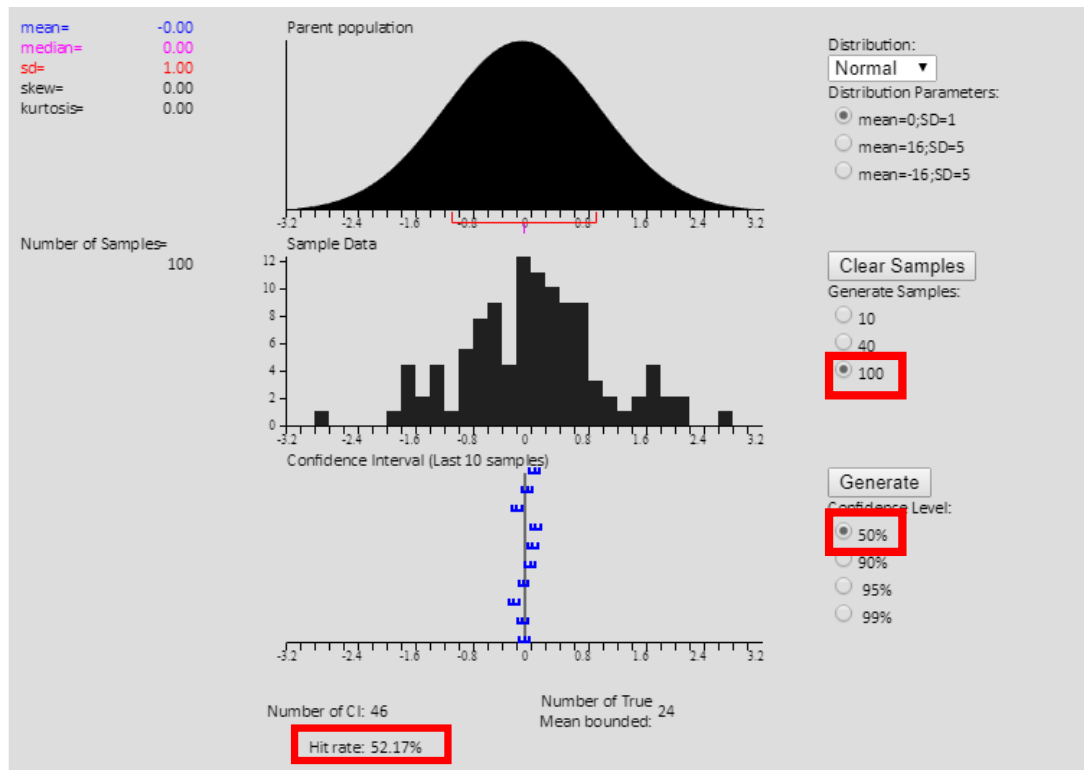
3. Set the Confidence level to 50% and click **Generate** for around 20 times and you will find the "Hit rate" get close to 50% as follows:



The "Number of True Mean bounded" and total "Number of CI" show that there are 11 out of 20 confidence intervals that contain the population mean, which is consistent with hit rate (11/20).

## Sample of size 100 with 50% confidence level

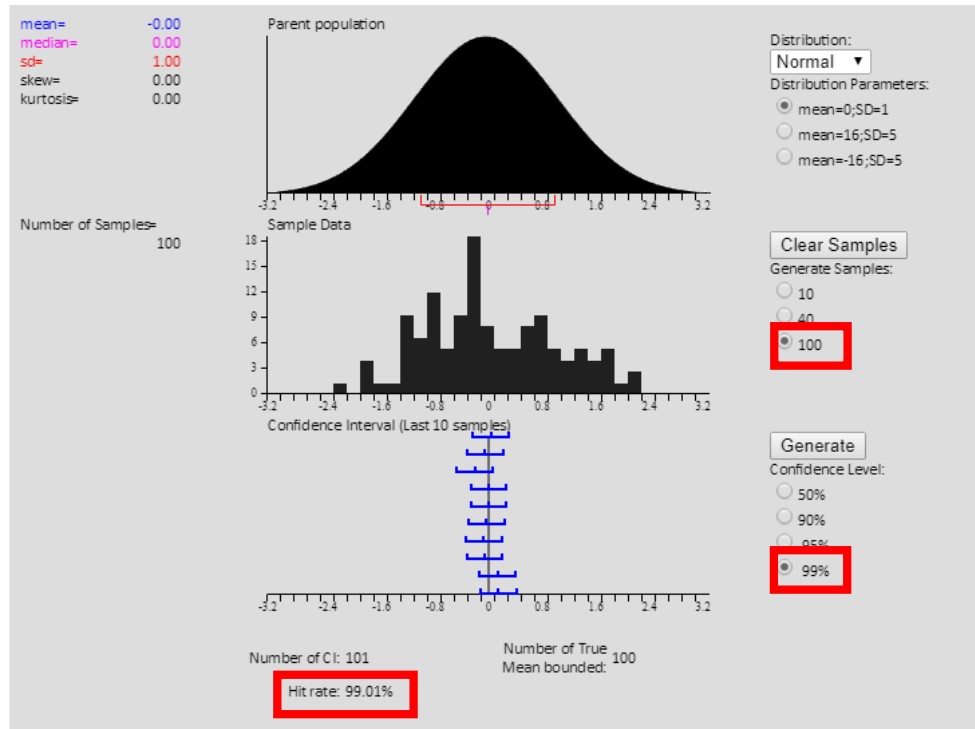
1. Set the sample size to 100 and repeat the process you will also find the hit rate is roughly around 50%



Yet one thing you should notice is that now the confidence intervals are so much narrower, although the hit rate didn't change.

## Sample of size 100 with 99% confidence level

1. If you repeat the process with sample size set at 100 and Confidence Level set to 99%, the Hit rate will also be 99% and the confidence intervals will be wider comparing to when confidence level was at 50%.



## Things to remember

1. Bigger sample size results in narrower confidence interval with no influence on hit rate.
2. Higher confidence level results in wider confidence interval and higher hit rate.