**Homework 17 Simulating Sampling Distributions.**

**Some definitions:**



The kurtosis for the standard normal is **3.** So often (almost always?) the measure used for samples is kurtosis-**3** (or excess kurtosis) and provides a comparison to the standard normal.

It is known that the estimate of kurtosis is biased for small samples. We can examine this using distributions with known values of kurtosis and simulate the small sample case.

1. Use the data step to generate the data.

1. Create a dataset, work.simsk, that contains 1,000 samples of size 50 from an exponential distribution. Use the random seed 54321.
2. Use proc means to create a dataset, work.moments, that contains the kurtosis values for each of the samples in simsk. Note that SAS calculates the excess (biased) version of the kurtosis.
3. Use proc sgplot to create the following figure of the kernel density estimate of the kurtosis statistic.

**A screenshot of a cell phone

Description automatically generated**

1. Use PROC IML to generate the data.
   1. Create a dataset, work.simsk2, that contains 1,000 samples of size 50 from an exponential distribution. Use the random seed 54321.
   2. Use a data step to create a dataset, work.moments2, that contains the kurtosis values for each of the samples in simsk2. Kurtosis is calculated with the *kurtosis*( ) function.
   3. Use proc sgplot to create the following figure of the kernel density estimate of the kurtosis statistic.

A screenshot of a cell phone

Description automatically generated