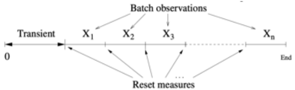
- Another approach is to run the model once, wait for it to warm up and reach (approximate) equilibrium, then divide the measurement time into batches, with X_i coming from batch i.



- If each X_i is itself a mean then this is called the **batch means** method.
- Yet the X_i may not be independent because the state at the end of one batch is the same as that at the start of the next!

If the X_i are **dependent**, then we have to take **covariances** into account to build an exact confidence interval.

The above confidence interval makes the assumption that $Var(\overline{X}) = \sigma^2/n$, and then uses S^2 as an estimate of σ^2.

However, if the X_i are dependent, then it can be shown that $Var(\overline{X}) = \frac{\sigma^2}{n} + \frac{1}{n^2}[2\sum_{i=1}^{n-1}\sum_{j=i+1}^{n} Cov(X_i, X_j)$.

If covariances are positive S^2/n becomes an **under-estimate** of $Var(\overline{X})$ and the computed confidence intervals are narrower than they should be.