Consequence Potential Model in Python (CPMod)

Introduction and Purpose

This tool was designed to stochastically calculate the summation of independent and dependent random variables. Although this tool can be applied to variety of problems it was initially designed to estimate consequence potentials of well designs in natural gas storage operations. This tool relies on Microsoft Excel to store inputs and Python to perform calculations.

At its core, the computational element was designed to model various iterations of a system that relies on the summation of random variables. This is done by performing a simple Monte Carlo simulation and adding each outcome to generate a total. The process is repeated multiple times to generate a range of possible outcomes and is meant to inform the end user of expected ranges.

The design of the workflow is tailored for entry-level programmers yet flexible enough to model user defined complex systems. Users will spend most of their time in excel setting up distributions for the system. They will only need to transition to Python to run the script. Outputs include figure generation, however, future versions will include additional methods for interrogating data.

To use this model, please visit the following webpage for more information:

https://github.com/sandialabs/CPMod