Lab 1

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1   Random Numbers

We may all have an intuitive sense of what a random number is. We may think of choosing lottery numbers and the respective draws that occur. This is a repeated process without any deterministic pattern. Mathematically this can be a bit tricky to understand. See the code example.

Randomness: a lack of predictability
Random Number Generator: generation of a number sequence without any pattern.
Pseudorandom Number Generator: algorithm that describes properties of randomness. We begin with a state, using a seed producing the same sequence.

Example:
1/ Try random number generation using the GSL GNU scientific library:
https://www.gnu.org/software/gsl/ see rng.cpp
2/ See the RANDU problem

2   Properties

Probability Density Function: a function whose definite integral over a given range gives the probability of occurrence within that range.
Cumulative Distribution Function: gives the probability that a random variable is less than or equal to the independent variable of the function.