

Generating random permutations

<http://marekrychlik.com/node/27>

A random permutation of numbers from 1 to n is used as a step in creating treatment groups, where n is the number of experimental units.

A random permutation may be obtained by drawing n random numbers from an interval $[0, 1]$ and sorting them. Thus, if x_1, x_2, \dots, x_n are the random numbers and the sorted order is $x_{k_1}, x_{k_2}, \dots, x_{k_n}$ then k_1, k_2, \dots, k_n is the desired permutation.

When a pseudo-random number generator is used (as it is typical today) we have only a finite quantity of random numbers, and thus there is a non-zero probability of repetition. Thus, very rarely the procedure fails to produce a permutation. Problems also arise when using fixed tables of random numbers.

A different procedure may be used to avoid the problem of repeated values, by using a drawing from a set $\{1, 2, \dots, n\}$ without replacement, or simulating one on a computer.