Theory

Calculating for any positive integer's n and x $\binom{n}{x} = \frac{n!}{x!\,(n-x)!}$ the probability for any number in any number of iterations is $\frac{\binom{n}{x}}{\sum_{i=0}^{n}\binom{n}{x}}$ as more and more iterations are computed; the graph of the probability of a given number becomes smoother and approaches a normal distribution as a limit. The normal distribution gives the probability as: $\frac{1}{\sqrt{2\pi}\sigma}e^{-\left(\frac{(x-\mu)^2}{2\sigma^2}\right)}$ where $\mu = \frac{n}{2}$ and σ is the standard deviation. Certainly, any set of random numbers may include consecutive numbers.

So the probability of consecutive numbers is $\frac{(d-p+1)10^{(d-p)}}{10^d}$ where the number of possible numbers of *d* digits which contain one or more sequences of *p*. When measuring the significance to experimentally discrete results one could use the chi-square $x^2 = \sum_{1 \le s \le k} \frac{(Y_s - np_s)^2}{np_s}$ an experiment with *d* degrees of freedom (where *d=k-1*, one less the number of possible outcomes) is consistent with the null hypothesis and can be calculated as: $Q_{x^2,d} = \left[2^{\frac{d}{2}}\Gamma\left(\frac{d}{2}\right)\right]^{-1}\int_{x^2}^{\infty}(t)^{\left(\frac{d}{2}-1\right)}e^{-t}\,dt$

Where Γ is the generalization of the factorial function to real and complex arguments.

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