Random Number Generator

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The work concerns a desktop application for generating random numbers, which implements a random number generator based on several high-fidelity algorithms [1][2][3][4]. It will simplify the process of generating random values and, in general, the conduct of research experiments that contain stochastic components. The functional capabilities offered by this application will solve a number of existing problems, such as: limited functionality of existing applications, lack of ability to check the suitability of random numbers, pseudo-randomness of generated values, etc. The application generates random numbers distributed in the interval (0;1), from which the user can optionally use them in their "raw" form, as well as obtain specific continuous (standard normal distribution, normal distribution, Erlang distribution, etc.) [1][5] and discrete random variates (Bernoulli, binomial, Poisson, etc.). The application includes a set of empirical-statistical tests [4], which will allow the user to test for (uniformity, independence, degree of correlation) the generated random numbers. To solve the problem of pseudo-randomness of the generated numbers, as a kind of experiment, we developed the so-called "true" random number generator. In our true random number generator, we will consider some noise as the source of randomness, from which our application will generate random numbers. To create the basic structure and logic of the application, we used the Python programming language, OOP and functional programming principles, the MongoDB non-relational database, and Qt Designer for developing the graphical interface.

References:

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