Chapter one
The basis of probability distribution simulator

1). The probability distribution simulator:
The theory of probability distribution simulator is very simple. In first, getting a random number which is the cumulative probability of a special probability distribution and using the inverse function of distribution function to get the random variable value. This random variable must be the continuous type.

$$X \sim f_X(x), F_X(x) = P(X \le x) \sim U(0,1), RND \sim U(0,1), RND = F_X(x), x = F_X^{-1}(RND)$$

RND is random number.

If the random variable value can be considered a data set when the data set has many values. The data set is established a frequency table as the probability distribution when data size is very large(The Law of Large Number).

$\{X_1, ..., X_n\}$, there are n random variables value from the probability distribution simulator. The data set is randomly and follows a special probability distribution and the number is very large(approach the special probability distribution). The sample frequency table is closely to the special probability distribution. Of course, the coefficient of data set is closely to coefficient of the special probability distribution.

In general, the simulator result is affected by the simulator method and the size of data set. This simulator is not only inverse function of distribution function, but also has a numerical analysis and the conditional probability when the distribution function is not exist.

This software program name is ' P_S_CCC.exe '. The program the data base is 60,000,000 values and the speed of simulating sample data is very fast that running time is 1~2 minutes .The coefficient result error is about 1/1000~1/10000.

If the memory can be expanded and cpu speed can promotion, the error will be decreasing.

This book is be written by the software program ' P_S_CCC.exe ', the software can don any kind transformation and the probability distribution after transformation has the image of frequency distribution and the coefficient and the distribution function estimated function and the probability function estimated function and the random variable value estimated function.