

Re: How to generate a Guassion Sample data?

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"fAnSKyer" <fanskyer@xxxxxxxxxx> writes:

When using random we can get a uniform data sample. But how to transfer this sample in to a Guassion Sample? Thanks? Did C or C++ provide any function to do this?

This is in the C FAQ.

13.20: How can I generate random numbers with a normal or Gaussian distribution?

A: Here is one method, recommended by Knuth and due originally to Marsaglia:

```
#include <stdlib.h>
#include <math.h>

double gaussrand()
{
    static double V1, V2, S;
    static int phase = 0;
    double X;

    if(phase == 0) {
        do {
            double U1 = (double)rand() / RAND_MAX;
            double U2 = (double)rand() / RAND_MAX;

            V1 = 2 * U1 - 1;
            V2 = 2 * U2 - 1;
            S = V1 * V1 + V2 * V2;
        } while(S >= 1 || S == 0);

        X = V1 * sqrt(-2 * log(S) / S);
    } else
        X = V2 * sqrt(-2 * log(S) / S);
}
```

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```
phase = 1 - phase;
```

```
return X;  
}
```

See the extended versions of this list (see question 20.40) for other ideas.

References: Knuth Sec. 3.4.1 p. 117; Marsaglia and Bray, "A Convenient Method for Generating Normal Variables"; Press et al., *Numerical Recipes in C* Sec. 7.2 pp. 288–290.

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"When I have to rely on inadequacy, I prefer it to be my own."

—Richard Heathfield

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