

NAG Toolbox for MATLAB

g05fa

1 Purpose

g05fa generates a vector of pseudo-random numbers uniformly distributed over the interval $[a, b]$.

2 Syntax

`[x] = g05fa(a, b, n)`

3 Description

If $a = 0$ and $b = 1$, g05fa returns the next n values y_i from a uniform $(0, 1)$ generator (see g05ka for details).

For other values of a and b , this function applies the transformation

$$x_i = a + (b - a)y_i.$$

The function ensures that the values x_i lie in the closed interval $[a, b]$.

If computing sequentially and using the same generator, this function always generates exactly the same pseudo-random numbers as would n consecutive calls of g05ka or g05lg, and on many machines is likely to be much faster.

4 References

Knuth D E 1981 *The Art of Computer Programming (Volume 2)* (2nd Edition) Addison–Wesley

5 Parameters

5.1 Compulsory Input Parameters

1: **a** – double scalar

2: **b** – double scalar

The end points a and b of the uniform distribution. It is not necessary that $a < b$.

3: **n** – int32 scalar

n , the number of pseudo-random numbers to be generated.

5.2 Optional Input Parameters

None.

5.3 Input Parameters Omitted from the MATLAB Interface

None.

5.4 Output Parameters

1: **x(n)** – double array

The n pseudo-random numbers from the specified uniform distribution.

6 Error Indicators and Warnings

None.

7 Accuracy

Not applicable.

8 Further Comments

None.

9 Example

```
a = 1;  
b = 1.5;  
n = int32(5);  
g05za('O');  
g05cb(int32(0));  
[x] = g05fa(a, b, n)
```

```
x =  
    1.3976  
    1.1129  
    1.1856  
    1.1125  
    1.4394
```