

NAG Toolbox for MATLAB

g05da

1 Purpose

g05da returns a pseudo-random real number taken from a uniform distribution over the interval $[a, b]$.

2 Syntax

```
[result] = g05da(a, b)
```

3 Description

This distribution has PDF (probability density function)

$$f(x) = \frac{1}{|a-b|} \quad \text{if} \quad x \in [a, b],$$

$$f(x) = 0 \quad \text{otherwise.}$$

g05da returns the value

$$x = a + (b - a)y$$

where y is a pseudo-random number from a uniform distribution over $(0, 1)$, generated by g05ca. The function ensures that x lies in the closed interval $[a, b]$.

g05fa may be used to generate a vector of n pseudo-random numbers which, if computed sequentially, are exactly the same as n successive values of this function. On many machines g05fa 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 distribution. It is not necessary that $a < b$.

5.2 Optional Input Parameters

None.

5.3 Input Parameters Omitted from the MATLAB Interface

None.

5.4 Output Parameters

- 1: **result** – double scalar

The result of the function.

6 Error Indicators and Warnings

None.

7 Accuracy

Not applicable.

8 Further Comments

None.

9 Example

```
a = 1;  
b = 1.5;  
g05za('O');  
g05cb(int32(0));  
[result] = g05da(a, b)
```

```
result =  
    1.3976
```