NAG Toolbox for MATLAB

g05kb

1 Purpose

g05kb sets the initial seeds for the selected generator as used by and passed to the group of pseudo-random number functions G05K–G05Q .

2 Syntax

```
[igen, iseed] = g05kb(igen, iseed)
```

3 Description

g05kb sets the seeds used by the selected generator mechanism (see the G05 Chapter Introduction) to values calculated from the parameter array **iseed**. The pseudo-random number generator is selected by the input value of the parameter **igen**.

For the same value of **igen**, this function will yield different subsequent sequences of random numbers if called with different values of **iseed**, but the sequences, if calculated sequentially, will be repeatable in different runs of the calling program. It should be noted that there is no guarantee of statistical properties between sequences, only within sequences.

4 References

None.

5 Parameters

5.1 Compulsory Input Parameters

1: **igen – int32 scalar**

Must contain the identification number for the generator to be used to return a pseudo-random number and should remain unchanged until a re-initialization by a call to one of the functions g05kb or g05kc. The values that may be chosen are:

igen $= 0$, the basic generator;

$1 \leq$ **igen** ≤ 273, a Wichman–Hill generator.

See the G05 Chapter Introduction for details.

2: **iseed**(4) **– int32 array**

Must contain values which are used to obtain an initial state for the generator selected by the parameter **igen**. The treatment of the array **iseed** differs depending on the value of **igen** input. As a result, the requirements for meaningful values of the elements of **iseed** also depend on **igen**; these requirements are as follows:

if **igen** $= 0$, only **iseed**(1) need be set to any nonnegative integer;

otherwise, all elements of **iseed** must be set and should be positive and are recommended to be at least five digits in length.

5.2 Optional Input Parameters

None.

5.3 Input Parameters Omitted from the MATLAB Interface

None.

5.4 Output Parameters

1: **igen – int32 scalar**

If **igen** < 0 on input then **igen** is set to 0, if **igen** > 273 on input then **igen** is set to $\mathrm{mod}(\textbf{igen} - 1, 273) + 1$.

2: **iseed**(4) **– int32 array**

Contains initial seeds for the selected generator.

6 Error Indicators and Warnings

None.

7 Accuracy

Not applicable.

8 Further Comments

None.

9 Example

```
igen = int32(1);
iseed = [int32(1762543);
     int32(9324783);
     int32(42344);
     int32(742355)];
[igenOut, iseedOut] = g05kb(igen, iseed)
```

```
igenOut =
           1
iseedOut =
     1762543
     9324783
       42344
      742355
```