

# NAG C Library Function Document

## nag\_rngs\_init\_nonrepeatable (g05kcc)

### 1 Purpose

nag\_rngs\_init\_nonrepeatable (g05kcc) sets the seeds to a non-repeatable initial value for the selected generator as used by and passed to the group of pseudo-random number functions g05k–g05q.

### 2 Specification

```
void nag_rngs_init_nonrepeatable (Integer *igen, Integer iseed[])
```

### 3 Description

nag\_rngs\_init\_nonrepeatable (g05kcc) sets the seeds used by the selected generator mechanism (see the g05 Chapter Introduction) to values calculated from the setting of the real-time clock. The pseudo-random number generator is selected by the input value of the parameter **igen**.

This function will yield different subsequent sequences of random numbers 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

1: **igen** – Integer \* *Input/Output*

*On entry:* must contain the identification number for the generator to be used to return a pseudo-random number and should remain unchanged until a re-initialisation by a call to one of the functions nag\_rngs\_init\_repeatable (g05kbc) or nag\_rngs\_init\_nonrepeatable (g05kcc). The values that may be chosen are:

**igen** = 0, the basic generator;

$1 \leq \mathbf{igen} \leq 273$ , a Wichman–Hill generator.

See the g05 Chapter Introduction for details.

*On exit:* If **igen** < 0 on input then **igen** is set to 0, if **igen** > 273 on input then **igen** is set to  $\text{mod}(\mathbf{igen} - 1, 273) + 1$ .

2: **iseed**[4] – Integer *Output*

*On exit:* contains values which define an initial state for the generator selected by the parameter **igen**. The values returned will differ for each run of the calling program.

### 6 Error Indicators and Warnings

None.

### 7 Accuracy

Not applicable.

## 8 Further Comments

None.

## 9 Example

The example program prints the first five pseudo-random real numbers from a uniform distribution between 0 and 1, generated by `nag_rngs_basic` (g05kac) after initialisation by `nag_rngs_init_nonrepeatable` (g05kcc).

### 9.1 Program Text

```
/* nag_rngs_init_nonrepeatable(g05kcc) Example Program.
 *
 * Copyright 2001 Numerical Algorithms Group.
 *
 * Mark 7, 2001.
 */

#include <stdio.h>
#include <nag.h>
#include <nag_stdlib.h>
#include <nagg05.h>

int main(void)
{
    /* Scalars */
    double x;
    Integer i, igen;
    Integer exit_status=0;

    /* Arrays */
    Integer iseed[4];

    Vprintf("g05kcc Example Program Results\n\n");

    /* Initialise the seed */
    iseed[0] = 1762543;
    iseed[1] = 9324783;
    iseed[2] = 42344;
    iseed[3] = 742355;
    /* igen identifies the stream. */
    igen = 1;
    g05kcc(&igen, iseed);
    for (i = 1; i <= 5; ++i)
    {
        x = g05kac(igen, iseed);
        Vprintf("%10.4f\n", x);
    }
    return exit_status;
}
```

### 9.2 Program Data

None.

### 9.3 Program Results

```
g05kcc Example Program Results

    0.6552
    0.4499
    0.0348
    0.0989
    0.3036
```