NAG Toolbox for MATLAB

g05yh

1 Purpose

g05yh generates a sequence of quasi-random numbers using Neiderreiter's method. It must be preceded by a call to g05yg to initialize the generator for **idim** dimensions.

2 Syntax

```
[quasi, iref, ifail] = g05yh(n, iref)
```

3 Description

g05yh generates a sequence of **n** quasi-random numbers of dimension **idim** using Neiderreiter's method.

4 References

None.

5 Parameters

5.1 Compulsory Input Parameters

1: **n – int32 scalar**

the number of quasi-random numbers required.

Constraint: $\mathbf{n} \geq 1$.

2: **iref**(**2000**) **– int32 array**

Contains vital information for the generator.

5.2 Optional Input Parameters

None.

5.3 Input Parameters Omitted from the MATLAB Interface

None.

5.4 Output Parameters

1: **quasi**(**n**,$*$) **– double array**

The first dimension of the array **quasi** must be at least 1

The second dimension of the array must be at least **idim** $+ 1$ if **idim** must be odd, and at least **idim** otherwise

Contains **n** quasi-random numbers of dimension **idim**.

2: **iref**(**2000**) **– int32 array**

Updated information for the generation of a further set of quasi-random numbers.

iref must not be changed between calls of g05yh.

3: **ifail – int32 scalar**

0 unless the function detects an error (see Section 6).

6 Error Indicators and Warnings

Errors or warnings detected by the function:

ifail = 1

Incorrect initialization. g05yg must be called prior to g05yh and **iref** must remain unaltered after this call.

ifail = 2

There have been too many calls to the generator. It is not able to deliver any more random numbers.

7 Accuracy

Not applicable.

8 Further Comments

None.

9 Example

```
idim = int32(6);
iskip = int32(0);
n = int32(2);
[iref, ifail] = g05yg(idim, iskip);
if (ifail == 0)
  sm = 0;
  for i = 1:5000
    [quasi, iref, ifail] = g05yh(n, iref);
    if ifail ~= 0, break, end;
      f = abs(4*quasi-2);
      sm = sm + prod(f(1,:)) + prod(f(2,:));
  end
  if (ifail == 0)
    vsbl = sm/2/5000;
    fprintf('\nValue of integral = %10.4f\n', vsbl);
  end
end
```

```
Value of integral =     0.9980
```