

NAG Toolbox for MATLAB

g05yd

1 Purpose

g05yd generates a sequence of quasi-random numbers using Faure's method. It must be preceded by a call to g05yc to initialize the generator for **idim** dimensions.

2 Syntax

```
[quasi, iref, ifail] = g05yd(n, iref)
```

3 Description

g05yd generates a sequence of **n** quasi-random numbers of dimension **idim** using Faure's method.

4 References

None.

5 Parameters

5.1 Compulsory Input Parameters

1: **n** – **int32** scalar

the number of quasi-random numbers required.

Constraint: $n \geq 1$.

2: **iref(406)** – **int32** array

Contains vital information for the generator, including the number of dimensions, **idim**.

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(406)** – **int32** array

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

iref must not be changed between calls of g05yd.

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. g05yc must be called prior to g05yd 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

```
n = int32(2);
idim = int32(15);
[iref, ifail] = g05yc(idim);
if (ifail == 0)
    sm = 0;
    for i = 1:5000
        [quasi, iref, ifail] = g05yd(n, iref);
        if ifail ~= 0, break, end;
        f = abs(4*quasi-2);
        sm = sm + prod(f(1,1:15)) + prod(f(2,1:15));
    end
    if (ifail == 0)
        vsbl = sm/2/5000;
        fprintf('\nValue of integral = %10.4f\n', vsbl);
    end
end
```

Value of integral = 0.9541