

NAG Toolbox for MATLAB

g05yj

1 Purpose

g05yj generates a Normal quasi-random number sequence in **idim**. One of the initialization functions g05yc, g05ye or g05yg must be called beforehand to determine whether a Faure, Sobol or Niederreiter sequence should be generated.

2 Syntax

```
[quasi, iref, ifail] = g05yj(xmean, std, n, iref)
```

3 Description

g05yj generates a Normal quasi-random number sequence.

4 References

None.

5 Parameters

5.1 Compulsory Input Parameters

- 1: **xmean(*)** – double array

Note: the dimension of the array **xmean** must be at least **idim** + 1 if **idim** must be odd, and at least **idim** otherwise (see g05yc).

Specifies, for each dimension, the mean of the Normal distribution.

- 2: **std(*)** – double array

Note: the dimension of the array **std** must be at least **idim** + 1 if **idim** must be odd, and at least **idim** otherwise (see g05yc).

Specifies, for each dimension, the standard deviation of the Normal distribution.

Constraint: **std**(*i*) ≥ 0.

- 3: **n** – int32 scalar

the number of quasi-random numbers required.

Constraint: **n** ≥ 1.

- 4: **iref(406)** – 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(406) – int32 array**

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

iref must not be changed since the last call to g05yc, g05ye or g05yg.

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

On entry, incorrect initialization has been detected.

ifail = 3

A standard deviation is negative.

ifail = 4

There have been too many calls to the generator.

7 Accuracy

Not applicable.

8 Further Comments

None.

9 Example

```
xmean = [1;  
         2;  
         3;  
         4];  
std = [1;  
       1;  
       1];  
n = int32(5);  
iref = [int32(1889);  
        int32(4);  
        int32(625);  
        int32(5);  
        int32(624);  
        int32(3);  
        int32(1);
```

```
int32(1);
int32(1);
int32(1);
int32(1);
int32(1);
int32(1);
int32(1);
int32(1);
int32(1);
int32(1);
int32(1);
int32(1);
int32(8183732);
int32(896);
int32(-1079158908);
int32(8129217);
int32(8185508);
int32(-1232448064);
int32(1);
int32(0);
int32(1);
int32(2);
int32(3);
int32(4);
int32(0);
int32(1);
int32(2);
int32(3);
int32(4);
int32(0);
int32(1);
int32(2);
int32(13846476);
int32(12);
int32(5);
int32(8183644);
int32(8091010);
int32(8090060);
int32(0);
int32(-1079158960);
int32(-1079158960);
int32(1);
int32(3);
int32(1);
int32(0);
int32(0);
int32(1);
int32(3);
int32(1);
int32(0);
int32(0);
int32(1);
int32(10581210);
int32(-1208202708);
int32(8183732);
int32(-1208203296);
int32(0);
int32(-1079158944);
int32(8123961);
int32(8264206);
int32(10581250);
int32(-1079158976);
int32(1);
int32(4);
int32(0);
int32(0);
int32(0);
int32(1);
int32(4);
int32(0);
```

```
int32(0);
int32(0);
int32(121387641);
int32(10579708);
int32(8183732);
int32(-1208204212);
int32(10579708);
int32(-1079158732);
int32(8124450);
int32(10575692);
int32(-1079158800);
int32(8185424);
int32(5);
int32(1);
int32(0);
int32(0);
int32(0);
int32(0);
int32(1);
int32(0);
int32(0);
int32(0);
int32(0);
int32(0);
int32(-1079158800);
int32(0);
int32(-1079158800);
int32(-1208123392);
int32(0);
int32(0);
int32(0);
int32(0);
int32(0);
int32(0);
int32(0);
int32(0);
int32(1);
int32(1);
int32(1);
int32(1);
int32(1);
int32(2);
int32(2);
int32(2);
int32(0);
int32(8215720);
int32(-1208202648);
int32(0);
int32(0);
int32(0);
int32(0);
int32(134513124);
int32(0);
int32(0);
int32(0);
int32(0);
int32(0);
int32(0);
int32(1);
int32(2);
int32(3);
int32(4);
int32(0);
int32(2);
int32(4);
int32(10581210);
int32(-1208202708);
int32(8183732);
int32(-1208203296);
int32(0);
int32(-1079158624);
int32(8123961);
int32(8264206);
```

```
int32(10581250);
int32(10629108);
int32(32);
int32(0);
int32(0);
int32(1080);
int32(1);
int32(3);
int32(1);
int32(0);
int32(0);
int32(2);
int32(128686770);
int32(10577173);
int32(8183732);
int32(-1208204212);
int32(10577173);
int32(-1079158412);
int32(8124450);
int32(10574844);
int32(-1079158480);
int32(8185424);
int32(5);
int32(-1232448912);
int32(1);
int32(0);
int32(1);
int32(1);
int32(4);
int32(0);
int32(0);
int32(0);
int32(0);
int32(-1079158480);
int32(784);
int32(-1079158480);
int32(0);
int32(134514164);
int32(134513332);
int32(0);
int32(0);
int32(0);
int32(0);
int32(0);
int32(0);
int32(0);
int32(128686770);
int32(-1079158372);
int32(1);
int32(0);
int32(0);
int32(0);
int32(268435460);
int32(8226488);
int32(-1208202648);
int32(0);
int32(0);
int32(0);
int32(0);
int32(0);
int32(0);
int32(0);
int32(8149204);
int32(0);
int32(0);
int32(0);
int32(0);
int32(8183732);
int32(-1208204640);
int32(1);
```

[illegible]

```
int32(7);
int32(-1079158088);
int32(3);
int32(132620);
int32(-1079157954);
int32(-1208122368);
int32(-1);
int32(0);
int32(0);
int32(7);
int32(134512692);
int32(134515696);
int32(1970170188);
int32(120);
int32(0);
int32(0);
int32(0);
int32(0);
int32(0);
int32(0);
int32(0);
int32(0);
int32(0);
int32(0);
int32(0);
int32(0);
int32(0);
int32(0);
int32(0);
int32(1768187136);
int32(1920295534);
int32(1848535143);
int32(1663985505);
int32(1802841711);
int32(0);
int32(0);
int32(0);
int32(0);
int32(0);
int32(0);
int32(0);
int32(0);
int32(0);
int32(0);
int32(0);
int32(0);
int32(0);
int32(0);
int32(775028736);
int32(842083894);
int32(825110829);
int32(1597388595);
int32(1932739398);
int32(28781);
int32(0);
int32(0);
int32(8142643);
int32(134514831);
int32(-1208202708);
int32(8183732);
int32(-1208203296);
int32(0);
int32(-1079157820);
int32(8123961);
int32(8264206);
int32(134514976);
int32(1917198416);
int32(32);
int32(0);
int32(0);
int32(1935);
int32(8264400);
int32(8243640);
int32(8209208);
```

```
quasi =
    0.9601    2.0402    4.8644    4.5595
   -1.8318    4.8417    2.0672    5.1945
   -0.5992    1.1887    1.9207    3.6074
    1.2093    0.6632    3.0283    3.1850
    1.9975    1.8402    3.3998    3.8853
irefOut =
    array elided
ifail =
    0
```