

NAG Toolbox for MATLAB

g05yk

1 Purpose

g05yk generates a log Normal quasi-random number sequence of **idim** dimensions. 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] = g05yk(xmean, std, n, iref)
```

3 Description

g05yk generates a log 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 underlying 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 underlying 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 between calls of g05yk.

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(-1080171260);
int32(8129217);
int32(8185508);
int32(-1232419392);
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(-1080171312);
int32(-1080171312);
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(-1208174036);
int32(8183732);
int32(-1208174624);
int32(0);
int32(-1080171296);
int32(8123961);
int32(8264206);
int32(10581250);
int32(-1080171328);
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(-1208175540);
int32(10579708);
int32(-1080171084);
int32(8124450);
int32(10575692);
int32(-1080171152);
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(-1080171152);
int32(0);
int32(-1080171152);
int32(-1208094720);
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(-1208173976);
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(-1208174036);
int32(8183732);
int32(-1208174624);
int32(0);
int32(-1080170976);
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(-1208175540);
int32(10577173);
int32(-1080170764);
int32(8124450);
int32(10574844);
int32(-1080170832);
int32(8185424);
int32(5);
int32(-1232420240);
int32(1);
int32(0);
int32(1);
int32(1);
int32(4);
int32(0);
int32(0);
int32(0);
int32(0);
int32(-1080170832);
int32(800);
int32(-1080170832);
int32(0);
int32(134514164);
int32(134513332);
int32(0);
int32(0);
int32(0);
int32(0);
int32(0);
int32(0);
int32(0);
int32(128686770);
int32(-1080170724);
int32(1);
int32(0);
int32(0);
int32(0);
int32(268435460);
int32(8226488);
int32(-1208173976);
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(-1208175968);
int32(1);
```

[illegible]

```
int32(7);
int32(-1080170440);
int32(3);
int32(132620);
int32(-1080170306);
int32(-1208093696);
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(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(-1208174036);
int32(8183732);
int32(-1208174624);
int32(0);
int32(-1080170172);
int32(8123961);
int32(8264206);
int32(134514976);
int32(1917198416);
int32(32);
int32(0);
int32(0);
int32(1935);
int32(8264400);
int32(8243640);
int32(8209208);
```

```

int32(8);
int32(-1232420772);
int32(-1232420704);
int32(24641422);
int32(134514901);
int32(8183732);
int32(8185508);
int32(134514901);
int32(-1080169960);
int32(8124450);
int32(134513828);
int32(-1080170028);
int32(8185424);
int32(5);
int32(-1232420704);
int32(1);
int32(0);
int32(1);
int32(0);
int32(0);
int32(0);
int32(8185424);
int32(10585072);
int32(-2147483648);
int32(-1080170028);
int32(0);
int32(-1080170028);
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(24641422);
int32(-1080169920);
int32(8185080);
int32(0);
int32(0);
int32(0);
int32(134533760);
int32(134539656);
int32(-1080170008);
int32(134515337);
int32(0);
int32(0)];
[quasi, irefOut, ifail] = g05yk(xmean, std, n, iref)

```

```

quasi =
    2.6120    7.6919  129.5899   95.5339
    0.1601  126.6900    7.9026  180.2768
    0.5492    3.2828    6.8258   36.8717
    3.3512    1.9409   20.6616   24.1673
    7.3708    6.2979   29.9591   48.6792
irefOut =
    array elided
ifail =
    0

```