NAG Toolbox for MATLAB

c06gs

1 Purpose

c06gs takes m Hermitian sequences, each containing n data values, and forms the real and imaginary parts of the m corresponding complex sequences.

2 Syntax

```
[u, v, ifail] = c06gs(m, n, x)
```

3 Description

This is a utility function for use in conjunction with c06fp and c06fq (see the C06 Chapter Introduction).

4 References

None.

5 Parameters

5.1 Compulsory Input Parameters

1: **m – int32 scalar**

m, the number of Hermitian sequences to be converted into complex form.

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

2: **n – int32 scalar**

n, the number of data values in each Hermitian sequence.

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

3: **x(m × n) – double array**

The data must be stored in **x** as if in a two-dimensional array of dimension $(1 : \mathbf{m}, 0 : \mathbf{n} - 1)$; each of the m sequences is stored in a **row** of the array in Hermitian form. If the n data values z_j^p are written as $x_j^p + iy_j^p$, then for $0 \leq j \leq n/2$, x_j^p is contained in $\mathbf{x}(p,j)$, and for $1 \leq j \leq (n-1)/2$, y_j^p is contained in $\mathbf{x}(p, n-j)$. (See also Section missing_entity_c06background12 in the C06 Chapter Introduction.)

5.2 Optional Input Parameters

None.

5.3 Input Parameters Omitted from the MATLAB Interface

None.

5.4 Output Parameters

1: **u**$(\mathbf{m} \times \mathbf{n})$ – **double array**

2: **v**$(\mathbf{m} \times \mathbf{n})$ – **double array**

The real and imaginary parts of the m sequences of length n, are stored in **u** and **v** respectively, as if in two-dimensional arrays of dimension $(1 : \mathbf{m}, 0 : \mathbf{n} - 1)$; each of the m sequences is stored as if in a **row** of each array. In other words, if the real parts of the pth sequence are denoted by x_j^p, for $j = 0, 1, \ldots, n-1$ then the mn elements of the array **u** contain the values

$$x_0^1, x_0^2, \ldots, x_0^m, x_1^1, x_1^2, \ldots, x_1^m, \ldots, x_{n-1}^1, x_{n-1}^2, \ldots, x_{n-1}^m$$

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, $\mathbf{m} < 1$.

ifail $= 2$

On entry, $\mathbf{n} < 1$.

7 Accuracy

Exact.

8 Further Comments

None.

9 Example

```
m = int32(3);
n = int32(6);
x = [0.3854;
     0.5417;
     0.9172;
     0.6772;
     0.2983;
     0.0644;
     0.1138;
     0.1181;
     0.6037;
     0.6751;
     0.7255;
     0.643;
     0.6362;
     0.8638;
     0.0428;
     0.1424;
     0.8723;
     0.4815];
[u, v, ifail] = c06gs(m, n, x)
```

```
u =
    0.3854
```

```
    0.5417
    0.9172
    0.6772
    0.2983
    0.0644
    0.1138
    0.1181
    0.6037
    0.6751
    0.7255
    0.6430
    0.1138
    0.1181
    0.6037
    0.6772
    0.2983
    0.0644
v =
         0
         0
         0
    0.1424
    0.8723
    0.4815
    0.6362
    0.8638
    0.0428
         0
         0
         0
   -0.6362
   -0.8638
   -0.0428
   -0.1424
   -0.8723
   -0.4815
ifail =
           0
```