

# NAG Library Routine Document

## F06EUF (DGTHR)

**Note:** before using this routine, please read the Users' Note for your implementation to check the interpretation of *bold italicised* terms and other implementation-dependent details.

### 1 Purpose

F06EUF (DGTHR) gathers specified (usually nonzero) elements of a real vector  $y$  in full storage form into a sparse real vector  $x$  in compressed form.

### 2 Specification

```
SUBROUTINE F06EUF (NZ, Y, X, INDX)
  INTEGER          NZ, INDX(*)
  REAL (KIND=nag_wp) Y(*), X(*)
```

The routine may be called by its BLAS name *dgthr*.

### 3 Description

F06EUF (DGTHR) gathers the specified elements of a vector,  $y$ , in full storage form, into  $x$ , the equivalent sparse vector compressed form.

### 4 References

Dodson D S, Grimes R G and Lewis J G (1991) Sparse extensions to the Fortran basic linear algebra subprograms *ACM Trans. Math. Software* **17** 253–263

### 5 Arguments

- |    |   |               |
|----|---|---------------|
| 1: | NZ – INTEGER  | <i>Input</i>  |
|    | <i>On entry:</i> the number of nonzeros in the compressed sparse vector $x$ .   |               |
| 2: | Y(*) – REAL (KIND=nag_wp) array   | <i>Input</i>  |
|    | <b>Note:</b> the dimension of the array Y must be at least $\max_k\{\text{INDX}(k)\}$ .   |               |
|    | <i>On entry:</i> the vector $y$ . Only elements corresponding to indices in INDX are accessed.  |               |
| 3: | X(*) – REAL (KIND=nag_wp) array   | <i>Output</i> |
|    | <b>Note:</b> the dimension of the array X must be at least $\max(1, \text{NZ})$ .   |               |
|    | <i>On exit:</i> the compressed vector $x$ .   |               |
| 4: | INDX(*) – INTEGER array   | <i>Input</i>  |
|    | <b>Note:</b> the dimension of the array INDX must be at least $\max(1, \text{NZ})$ .  |               |
|    | <i>On entry:</i> $\text{INDX}(i)$ must contain the index $Y(i)$ , for $i = 1, 2, \dots, \text{NZ}$ , which is to be gathered into $x$ . |               |

### 6 Error Indicators and Warnings

None.

## **7 Accuracy**

Not applicable.

## **8 Parallelism and Performance**

F06EUF (DGTHR) is not threaded in any implementation.

## **9 Further Comments**

None.

## **10 Example**

None.

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