

# NAG Library Routine Document

## F06EVF (DGTHRZ)

**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

F06EVF (DGTHRZ) gathers specified (usually nonzero) elements of a real vector  $y$  in full storage form into a sparse real vector  $x$  in compressed form. The specified elements of  $y$  are set to zero.

### 2 Specification

```
SUBROUTINE F06EVF (NZ, Y, X, INDX)
  INTEGER          NZ, INDX(*)
  REAL (KIND=nag_wp) Y(*), X(*)
```

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

### 3 Description

F06EVF (DGTHRZ) gathers the specified elements of a vector,  $y$ , in full storage form, into the equivalent sparse vector compressed form. The gathered elements of  $y$  are set to zero.

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

## **6 Error Indicators and Warnings**

None.

## **7 Accuracy**

Not applicable.

## **8 Parallelism and Performance**

F06EVF (DGTHRZ) is not threaded in any implementation.

## **9 Further Comments**

None.

## **10 Example**

None.

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