

NAG Fortran Library Routine Document

F06PMF (DGER)

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

F06PMF (DGER) performs the rank-1 update operation

$$A \leftarrow \alpha xy^T + A,$$

where A is an m by n real matrix, x is an m element real vector, y is an n element real vector, and α is a real scalar.

2 Specification

```
SUBROUTINE F06PMF (M, N, ALPHA, X, INCX, Y, INCY, A, LDA)
  INTEGER          M, N, INCX, INCY, LDA
  double precision ALPHA, X(*), Y(*), A(LDA,*)
```

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

3 Description

None.

4 References

None.

5 Parameters

- | | | |
|----|--------------------------------------------------------------------------------------------|--------------|
| 1: | M – INTEGER | <i>Input</i> |
| | <i>On entry:</i> m , the number of rows of the matrix A . | |
| | <i>Constraint:</i> $M \geq 0$. | |
| 2: | N – INTEGER | <i>Input</i> |
| | <i>On entry:</i> n , the number of columns of the matrix A . | |
| | <i>Constraint:</i> $N \geq 0$. | |
| 3: | ALPHA – double precision | <i>Input</i> |
| | <i>On entry:</i> the scalar α . | |
| 4: | X(*) – double precision array | <i>Input</i> |
| | <i>On entry:</i> the vector x . | |
| 5: | INCX – INTEGER | <i>Input</i> |
| | <i>On entry:</i> the increment in the subscripts of X between successive elements of x . | |
| | <i>Constraint:</i> $INCX \neq 0$. | |

- 6: Y(*) – *double precision* array *Input*
On entry: the vector *y*.
- 7: INCY – INTEGER *Input*
On entry: the increment in the subscripts of Y between successive elements of *y*.
Constraint: INCY \neq 0.
- 8: A(LDA,*) – *double precision* array *Input/Output*
Note: the second dimension of the array A must be at least $\max(1, N)$.
On entry: the *m* by *n* matrix *A*.
On exit: the updated matrix *A*.
- 9: LDA – INTEGER *Input*
On entry: the first dimension of the array A as declared in the (sub)program from which F06PMF (DGER) is called.
Constraint: LDA \geq $\max(1, M)$.

6 Error Indicators and Warnings

None.
