NAG Library Routine Document

F16ELF (BLAS_DSUM)

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

F16ELF (BLAS_DSUM) sums the elements of a real vector.

2 Specification

double precision `FUNCTION F16ELF(N, X, INCX)`

```
INTEGER                          N, INCX
double precision                 X(1+(N-1)*ABS(INCX))
```

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

3 Description

F16ELF (BLAS_DSUM) returns the sum

$$x_1 + x_2 + \cdots + x_n$$

of the elements of an n-element real vector x, via the function name.

If N ≤ 0 on entry, F16ELF (BLAS_DSUM) returns the value 0.

4 References

Basic Linear Algebra Subprograms Technical (BLAST) Forum (2001) *Basic Linear Algebra Subprograms Technical (BLAST) Forum Standard* University of Tennessee, Knoxville, Tennessee URL: http://www.netlib.org/blas/blast-forum/blas-report.pdf

5 Parameters

1: N – INTEGER *Input*

On entry: n, the number of elements in x.

2: X$(1 + (\text{N} - 1) \times |\text{INCX}|)$ – ***double precision*** array *Input*

On entry: the vector x. Element x_i is stored in X$(1 + (i - 1) \times |\text{INCX}|)$, for $i = 1, 2, \ldots, n$.

3: INCX – INTEGER *Input*

On entry: the increment in the subscripts of X between successive elements of x.

Constraint: INCX $\neq 0$.

6 Error Indicators and Warnings

If INCX $= 0$, an error message is printed and program execution is terminated.

7 Accuracy

Not applicable.

8 Further Comments

None.

9 Example

This example computes the sum of the elements of

$$x = (1.1, 10.2, 11.5, -2.7, 9.2)^{\mathrm{T}}.$$

9.1 Program Text

```
*     F16ELF Example Program Text
*     Mark 22 Release. NAG Copyright 2007.
*     .. Parameters ..
      INTEGER          NIN, NOUT
      PARAMETER        (NIN=5,NOUT=6)
      INTEGER          NMAX, INCMAX
      PARAMETER        (NMAX=10,INCMAX=NMAX)
*     .. Local Scalars ..
      DOUBLE PRECISION SUMVAL
      INTEGER          I, INCX, N
*     .. Local Arrays ..
      DOUBLE PRECISION X(1+(NMAX-1)*ABS(INCMAX))
*     .. External Functions ..
      DOUBLE PRECISION BLAS_DSUM
      EXTERNAL         BLAS_DSUM
*     .. Intrinsic Functions ..
      INTRINSIC        ABS
*     .. Executable Statements ..
      CONTINUE
*
      WRITE (NOUT,*) 'F16ELF/BLAS_DSUM Example Program Results'
*
*     Skip heading in data file
*
      READ (NIN,*)
*
*     Read N and INCX from data file
*
      READ (NIN,*) N, INCX
*
      IF (N.LE.NMAX .AND. ABS(INCX).LE.INCMAX) THEN
*
*        Read X from data file
*
         READ (NIN,*) (X(I),I=1,1+(N-1)*ABS(INCX),INCX)
*
*        Sum the elements of X
*
         SUMVAL = BLAS_DSUM(N,X,INCX)
*
         WRITE (NOUT,*)
         WRITE (NOUT,99999) SUMVAL
      END IF
*
99999 FORMAT (1X,'Sum of elements of X is',F9.5)
      END
```

9.2 Program Data

```
F16ELF/BLAS_DSUM Example Program Data
  5   1                                          : N and INCX
  1.1   10.2   11.5   -2.7   9.2                  : Array X
```

9.3 Program Results

```
 F16ELF/BLAS_DSUM Example Program Results

 Sum of elements of X is 29.30000
```