

NAG Library Routine Document

F16GLF (BLAS_ZSUM)

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

F16GLF (BLAS_ZSUM) sums the elements of a complex vector.

2 Specification

```
complex*16 FUNCTION F16GLF(N, X, INCX)
INTEGER                N, INCX
complex*16           X(1+(N-1)*ABS(INCX))
```

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

3 Description

F16GLF (BLAS_ZSUM) returns the sum

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

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

If $N \leq 0$ on entry, F16GLF (BLAS_ZSUM) returns the value $0 + 0i$.

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 | <i>Input</i> |
| | <i>On entry:</i> n , the number of elements in x . | |
| 2: | $X(1 + (N - 1) \times INCX)$ – complex*16 array | <i>Input</i> |
| | <i>On entry:</i> the vector x . Element x_i is stored in $X(1 + (i - 1) \times INCX)$, for $i = 1, 2, \dots, n$. | |
| 3: | 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 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

$$x = (1.1 + 10.2i, 11.5 - 2.7i, 9.2)^T.$$

9.1 Program Text

```
*      F16GLF 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 ..
      COMPLEX *16      SUMVAL
      INTEGER          I, INCX, N
*      .. Local Arrays ..
      COMPLEX *16      X(1+(NMAX-1)*ABS(INCMAX))
*      .. External Functions ..
      COMPLEX *16      BLAS_ZSUM
      EXTERNAL         BLAS_ZSUM
*      .. Intrinsic Functions ..
      INTRINSIC        ABS
*      .. Executable Statements ..
      CONTINUE

      WRITE (NOUT,*) 'F16GLF/BLAS_ZSUM 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_ZSUM(N,X,INCX)
*
*          WRITE (NOUT,*)
*          WRITE (NOUT,99999) SUMVAL
      END IF
*
99999 FORMAT (1X,'Sum of elements of X is (',F9.5,',',F9.5,')')
      END
```

9.2 Program Data

```
F16GLF/BLAS_ZSUM Example Program Data
  3  1                                     : N and INCX
  ( 1.1, 10.2) ( 11.5,-2.7) ( 9.2, 0.)   : Array X
```

9.3 Program Results

F16GLF/BLAS_ZSUM Example Program Results

Sum of elements of X is (21.80000, 7.50000)
