

## NAG Toolbox

### nag\_blast\_zsum (f16gl)

## 1 Purpose

nag\_blast\_zsum (f16gl) sums the elements of a complex vector.

## 2 Syntax

```
[result] = nag_blast_zsum(n, x, incx)
[result] = f16gl(n, x, incx)
```

## 3 Description

nag\_blast\_zsum (f16gl) 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, nag\_blast\_zsum (f16gl) 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  
<http://www.netlib.org/blas/blast-forum/blas-report.pdf>

## 5 Parameters

### 5.1 Compulsory Input Parameters

1: **n** – INTEGER

$n$ , the number of elements in  $x$ .

2: **x(1 + (n - 1) × |incx|)** – COMPLEX (KIND=nag\_wp) array

The vector  $x$ . Element  $x_i$  is stored in  $\mathbf{x}((i - 1) \times |\text{incx}| + 1)$ , for  $i = 1, 2, \dots, n$ .

3: **incx** – INTEGER

The increment in the subscripts of  $\mathbf{x}$  between successive elements of  $x$ .

*Constraint:*  $\text{incx} \neq 0$ .

### 5.2 Optional Input Parameters

None.

### 5.3 Output Parameters

1: **result**

The result of the function.

## 6 Error Indicators and Warnings

If `incx` = 0, an error message is printed and program execution is terminated.

## 7 Accuracy

The BLAS standard requires accurate implementations which avoid unnecessary over/underflow (see Section 2.7 of Basic Linear Algebra Subprograms Technical (BLAST) Forum (2001)).

## 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

```
function f16gl_example

fprintf('f16gl example results\n\n');

% sum complex x
n      = nag_int(3);
x      = [ 1.1 + 10.2i      11.5 - 2.7i      9.2 + 0i];
incx  = nag_int(1);

[xsum] = f16gl(n, x, incx);

fprintf('sum(x) = %7.1f%+7.1fi\n', real(xsum), imag(xsum));
```

### 9.2 Program Results

```
f16gl example results
sum(x) =    21.8    +7.5i
```

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