1 SUMMARY

This integer function counts the number of entries in a real vector which are equal to zero.

ATTRIBUTES — Version: 1.0.0. Types: IM01A; IM01AD. Language: A CRAY-2 assembler version is available and is about twenty times faster. Original date: May 1983 Origin: I.S. Duff, Harwell.

2 HOW TO USE THE PACKAGE

IM01 is an INTEGER FUNCTION which gives the number of entries, NZERO, in a real vector which are exactly zero.

The single precision version

\[ \text{NZERO} = \text{IM01A} \left( \text{LA}, \text{A}, \text{INC} \right) \]

The double precision version

\[ \text{NZERO} = \text{IM01AD} \left( \text{LA}, \text{A}, \text{INC} \right) \]

\( \text{LA} \) is an INTEGER variable which must be set on entry to the number of entries in array \( \text{A} \). It is not altered by \( \text{IM01A/AD} \).

\( \text{A} \) is a REAL (DOUBLE PRECISION in the D version) array of length at least \( \text{INC}\times\text{LA} \). The user must set \( \text{A} \) to contain the vector for which a count of the number of zero entries is required. \( \text{A} \) is not altered by \( \text{IM01A/AD} \).

\( \text{INC} \) is an INTEGER variable which must be set on entry to the displacement in \( \text{A} \) between successive components of the vector. This enables the function to operate on a row of a two dimensional array whose leading dimension is \( \text{INC} \). \( \text{INC} \) is not altered by \( \text{IM01A/AD} \).

3 GENERAL INFORMATION

Use of common: The subroutine does not use any common areas or auxiliary subroutines.

Workspace: There are no work arrays used by \( \text{IM01A/AD} \).

Portability: A Cray-2 assembler version is available.

4 METHOD

On the CRAY, the subroutine is a simple modification of the CRAY SCILIB subroutine \( \text{ILSUM} \) which returns the number of true values in a LOGICAL array.

\( \text{CAL} \) is used for efficiency. \( \text{IM01} \) is used in the main subroutine of the CRAY version of \( \text{MA32} \) and its use is discussed further in the report by Duff(1983).

References