> Package `IM01` was designed for use by package `MA32` which has itself been superseded; the use of this routine is not recommended.

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

        NZERO = IM01A(LA,A,INC)

The double precision version

        NZERO = IM01AD(LA,A,INC)

LA   is an `INTEGER` variable which must be set on entry to the number of entries in array `A`. It is not altered by `IM01A/AD`.

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

INC is an `INTEGER` variable which must be set on entry to the displacement in 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 `INC`. `INC` is not altered by `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 `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 `ILSUM` which returns the number of true values in a `LOGICAL` array.

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

References

Duff, I.S. (1983) Enhancements to the MA32 package for solving sparse unsymmetric equations. Harwell Report AERE R.11009.