如何使用內建 **SVD** 程式

1. 要使用內建 SVD 程式的時候， 先在第一行輸入 USE MSIMSL，開啟內建程式。

2. 使用內建 SVD 程式時，CALL DLSVRR 為倍精度實數 SVD 或 CALL LSVRR 為單精度實數 SVD，其中宣告變數說明如下:

Usage

CALL LSVRR (NRA, NCA, A, LDA, IPATH, TOL, IRANK, S, U, LDU, V, LDV)

Arguments

NRA — Number of rows in the matrix A.   (Input)

NCA — Number of columns in the matrix A.   (Input)

A — NRA by NCA matrix whose singular value decomposition is to be computed.   (Input)

LDA — Leading dimension of A exactly as specified in the dimension statement of the calling program.   (Input)

IPATH — Flag used to control the computation of the singular vectors.   (Input)

IPATH has the decimal expansion IJ such that:

I = 0 means do not compute the left singular vectors;

I = 1 means return the NCA left singular vectors in U;

I = 2 means return only the min(NRA, NCA) left singular vectors in U;

J = 0 means do not compute the right singular vectors,

J = 1 means return the right singular vectors in V.

For example, IPATH = 20 means I = 2 and J = 0.

TOL — Scalar containing the tolerance used to determine when a singular value is negligible.   (Input)

If TOL is positive, then a singular value si considered negligible if si £ TOL . If TOL is negative, then a singular value si considered negligible if si £ |TOL| * ||A||¥. In this case, |TOL| generally contains an estimate of the level of the relative error in the data.

IRANK — Scalar containing an estimate of the rank of A.   (Output)

S — Vector of length min(NRA + 1, NCA) containing the singular values of A in descending order of magnitude in the first min(NRA, NCA) positions.   (Output)

U — NRA by NCU matrix containing the left singular vectors of A.   (Output)

NCU must be equal to NRA if I is equal to 1. NCU must be equal to min(NRA, NCA) if I is equal to 2. U will not be referenced if I is equal to zero. If NRA is less than or equal to NCU, then U can share the same storage locations as A. See Comments.

LDU — Leading dimension of U exactly as specified in the dimension statement of the calling program.   (Input)

V — NCA by NCA matrix containing the right singular vectors of A.   (Output)

V will not be referenced if J is equal to zero. V can share the same storage location as A, however, U and V cannot both coincide with A simultaneously.

LDV — Leading dimension of V exactly as specified in the dimension statement of the calling program.   (Input)