Details

The singular value decomposition is computed using LAPACK routines. The diagonal elements of matrix W are returned as a 1D wave named W_W. If /B is used W_W will have N elements. Otherwise the number of elements in W_W is min(M,N).

The matrix V is returned in a matrix wave named M_V if /B is used otherwise the transpose V^T is returned in the wave M_VT.

All output objects are created in the current data folder.

The variable V_flag is set to zero if the operation succeeds. It is set to 1 if the algorithm fails to converge.

The variable V_SVConditionNumber is set to the condition number of the input matrix. The condition number is the ratio of the largest singular value to the smallest.

Example

```
Make/O/D/N=(10,20) A=gnoise(10)
MatrixSVD A
MatrixOp/O diff=abs(A-(M_U x DiagRC(W_W,10,20) x M_VT))
Print sum(diff,-inf,inf)
```

References

J.C. Nash and S.Shlien "Simple Algorithms for the Partial Singular Value Decomposition", The Comp. J. (30) No. 3 1987.

See Also

The **MatrixOp** operation for more efficient matrix operations.

Matrix Math Operations on page III-138 for more about Igor's matrix routines and for background references with details about the LAPACK libraries.

MatrixTrace

matrixTrace(*dataMatrix*)

The matrixTrace function calculates the trace (sum of diagonal elements) of a square matrix. *dataMatrix* can be of any numeric data type.

If the matrix is complex, it returns the sum of the magnitudes of the diagonal elements.

See Also

Matrix Math Operations on page III-138 for more about Igor's matrix routines.

MatrixTranspose

MatrixTranspose [**/H**] ***matrix***

The MatrixTranspose operation Swaps rows and columns in *matrix*.

Does not take complex conjugate if data are complex. You can do that as a follow-on step.

Swaps row and column labels, units and scaling.

This works with text as well as numeric waves. If the matrix has zero data points, it just swaps the row and column scaling.

Flags

/H	Computes the Hermitian conjugate of a complex wave.

See Also

The **MatrixOp** operation for more efficient matrix operations.

Matrix Math Operations on page III-138 for more about Igor's matrix routines.