Flags

/D Creates the wave W_W that contains eigenvalues of the singular value decomposition (SVD) for the pseudo-inverse calculation. If one or more of the eigenvalues are small, the matrix may be close to singular.

/G Calculates only the direct inverse; does not affect calculation of pseudo-inverse. By default, it calculates the inverse of the matrix using LU decomposition. The inverse is calculated using Gauss-Jordan method. The only advantage in using Gauss-Jordan is that it is more likely to flag singular matrices than the LU method.

/O Overwrites the source with the result.

/P Calculates the pseudo-inverse of a matrix using the SVD algorithm. The calculated pseudo-inverse is a unique minimal solution to the problem:

$$\min_{\mathbf{X}\in\mathbb{R}^{n\times m}} \left|\left|\mathbf{AX} - I_m\right|\right|.$$

Examples

```
Make/O/N=(2,2) mat0 = {{2,3},{1,7}}
MatrixInverse mat0                      // Creates wave M_inverse
MatrixOp/O/T=1 mat1 = M_inverse x mat0  // Check result

Make/O/D/N=(4,6) mat1 = enoise(4)
MatrixInverse/P mat1
MatrixOP/O/T=1 aa = mat1 x M_Inverse
MatrixOP/O/P=1 avgAbsErr = sum(abs(mat1 x M_Inverse - identity(4)))/12
```

See Also

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

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

References

See sec. 5.5.4 of:

Golub, G.H., and C.F. Van Loan, *Matrix Computations*, 2nd ed., Johns Hopkins University Press, 1986.

MatrixLinearSolve

MatrixLinearSolve [***flags***] ***matrixA matrixB***

The MatrixLinearSolve operation solves the linear system *matrixA* *X=*matrixB* where *matrixA* is an N-by-N matrix and *matrixB* is an N-by-NRHS matrix of the same data type.